2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: March 2023

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Report Reference Number	HASR23
Date	March 2023

Executive Summary: Air Quality in Our Area

Air Quality in Hartlepool

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].

The Borough of Hartlepool is situated on the North East coast within the Tees Valley and has a population of 92,338 (0.3% increase from 92,000 in 2011)[5]. Hartlepool has a strong industrial heritage and, in the past, this has often made a significant contribution to poor air quality in the area and, early air quality monitoring within Hartlepool and neighbouring councils was specifically targeted to industrial sources of pollution.

Many of the old industrial plants have now closed and regulation has improved significantly over the decades. In 2022 there were 18 permits in place for businesses in Hartlepool regulated by the Environmental Agency and a further 24 permits in place for businesses regulated by the Local Authority under The Environmental Permitting Regulations 2016. The closure of plants and better regulation has resulted in industrial air pollution at ground level being greatly reduced.

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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

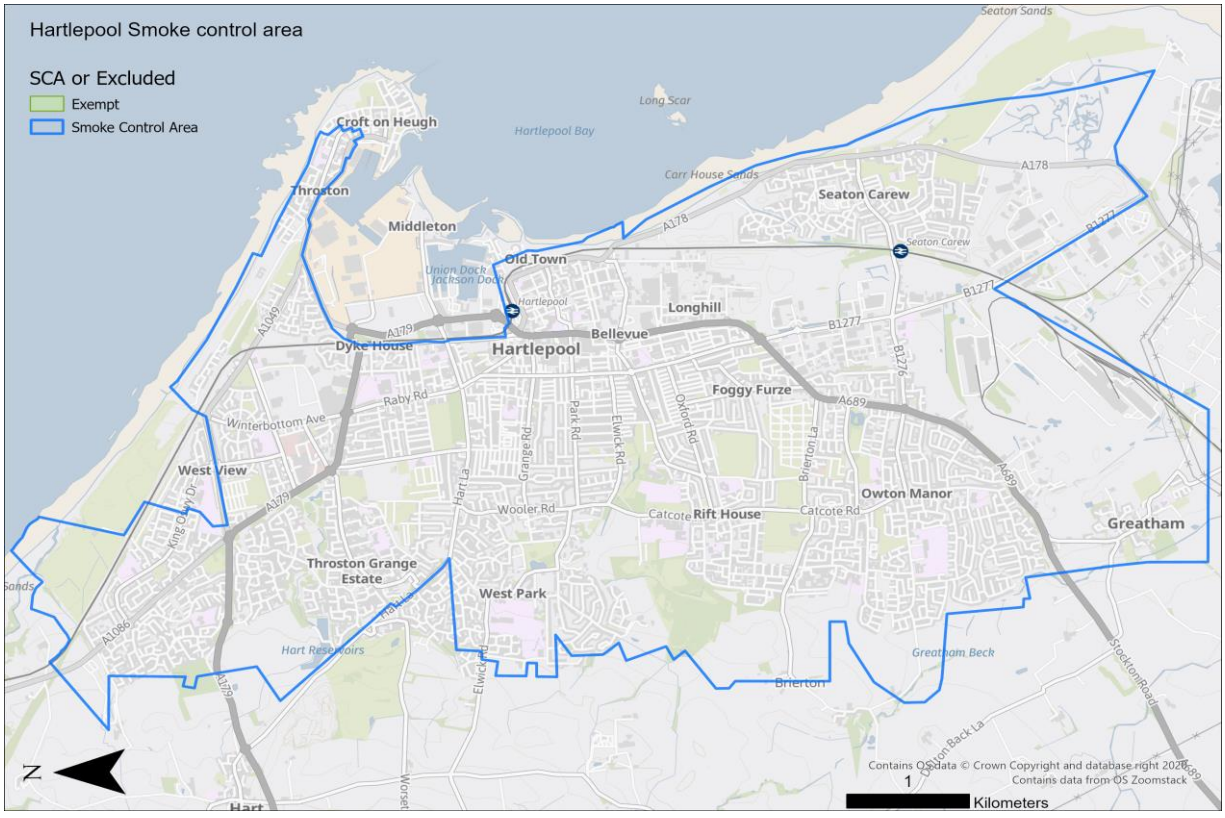
[5] Office for National Statistics (ONS). How life has changed in Hartlepool: Census 2021

Please see both Public Registers at: https://www.hartlepool.gov.uk/downloads/file/6303/public_register_-_environmental_permits and https://environment.data.gov.uk/public-register/industrial-installations/registration?__details=true&__postcode&address-search&dist=1&easting&local-authority=Hartlepool&name-search&northing&number-search

Another source of air pollution within Hartlepool arises from construction sites and residential properties. Within 2022 there were 5 planning applications approved for substantial residential developments in Hartlepool which may affect local air quality.

Hartlepool has an extensive coastline and at times of strong north-easterly weather, there can be high levels of natural particulates which may have health effects for some members of the public. Although not frequent events, Hartlepool does experience foam storms. Sea foam can hold algal toxins or surface-active pollutants in its bubbles which, when released into the air can pose a health risk for individuals with pre-existing health conditions and may cause irritation to the eyes.

Most residential properties in the Borough of Hartlepool are included in a smoke control area (see map below) where the solid fuels used are restricted to those approved by DEFRA or fuels burned in a DEFRA approved appliance in order to reduce emissions to the atmosphere.



Notwithstanding this, Officers within the Environmental Protection team regularly receive reports, and investigate cases, where unauthorized fuels and/or appliances are being used within the smoke control areas.

Over recent years there has been an increase in the use of solid fuel stoves as a source of heating for domestic properties potentially further increasing the emission of harmful environmental pollutants. A resident can install a log burner or multi fuel stove provided it is on the DEFRA list of exempted appliances and is installed by a competent person registered under the HETAS scheme.

In 2021, the Air Quality (Domestic Solid Fuel Standards) (England) Regulations 2020 came into force which tightened the standards relating to the sale of wood and other fuels which can be burnt in a domestic property and ensures that the sale of wood for combustion in domestic properties includes a 'ready to burn' mark.

Although there are several factors which affect air quality, it is pollution from road traffic, with its primary emissions at ground level, which is now of greatest concern to public health, and is the focus for air quality monitoring within Hartlepool.

Whilst road traffic has increased dramatically over recent decades in the United Kingdom, largely due to the increase in car ownership, Hartlepool still has a relatively low level of car ownership. The 2021 Office for National Statistics (ONS) Census[6] revealed that 29.6% of households in the Borough have no car. This compares with a National Figure of 23.5%.

Within Hartlepool through traffic is generally light and is channelled onto the main A689 and A179 through-route leading to the main A19 trunk road which passes well to the west of the town, through rural areas.

[6] Office for National Statistics, Census, 2021

For Hartlepool, the main impact on public health is along commuter roads, and it is in this area that most action needs to be targeted to alleviate air pollution. Fortunately, most housing along these roads is low rise, and set back from kerbside so that there is good dispersion of air pollutants compared with older UK cities and towns.

Hartlepool Borough Council reviews and undertakes air quality assessments independently and also in co-operation with neighbouring Councils in the Tees Valley. The Council produces annual reports for the UK Government and, once finalised, these reports are available for the public and published on the Council's website.

Air quality monitoring is normally carried out via the use of three automatic sites at Stockton Road, the Headland and St Abbs Walk (Automatic Urban and Rural Network AURN) as well as diffusion tubes situated across the Borough. The pollutants measured are Particulate Matter 10 (PM_{10}), Particulate Matter 2.5 ($PM_{2.5}$) and Nitrogen Dioxide (NO_2) at St Abbs Walk and PM_{10} and NO_2 at Stockton Road and the Headland.

Hartlepool's annual report has consistently concluded that air quality in the Borough is generally good in areas where the public are regularly exposed to air pollution. As the results are below objective levels set by Government, there has been no need to declare any Air Quality Management areas in the Borough. Notwithstanding this, Hartlepool Borough Council has, through partnership-working, introduced a range of initiatives and actions as part of its commitment to improving air quality. The majority of these actions and initiatives are to reduce the environmental impact of traffic on the roads and encourage healthier, alternative methods of transport.

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[7] 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, due to be published in 2023, will provide more

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

information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[8] 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 heavily influenced by transport emissions.

Hartlepool Borough Council works jointly with neighbouring authorities in the Tees Valley and other external agencies to implement actions to improve air quality. The Tees Valley Combined Authority has developed a joint strategic transport plan in collaboration with the five constituent Local Authorities, Darlington, Middlesbrough, Redcar & Cleveland, Stockton-on-Tees and Hartlepool. The plan covers the period 2020-2030 and has the vision “To provide a high quality, quick, affordable, reliable, low carbon and safe transport network for people and freight to move within, to and from Tees Valley”.

Within the Council, Environmental Health professionals work closely with officers from various disciplines, including Public Health, Traffic and Transportation and Planning to improve air quality in the area.

Conclusions and Priorities

The data collected from the St Abbs Walk automatic air quality monitoring station and the diffusion tube sites all indicate that the levels of NO_2 remain below 2019 (pre-pandemic) figures, however the levels are increasing again year on year and had increased slightly from those recorded in 2021. The levels are all well below the national objective levels.

Data for PM_{10} was not available from the Stockton Road and Headland stations due to equipment failure. However, new data for PM_{10} was available from the St Abbs Walk (AURN) site and the level at that site was 11.6 µg/m³ with no exceedances (>50 µg/m³) during 2022.

$PM_{2.5}$ is now measured in Hartlepool at the St Abbs Walk (AURN) site when previously it was calculated based on PM_{10} levels and using a nationally derived figure to calculate the

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

likely level from verified levels in neighbouring Local Authorities. The actual level for Hartlepool measured in 2022 was 6.5 µg/m³.

There was no national objective set in 2022 for $PM_{2.5}$ however a target is to be introduced in 2023. 'By the end of 2040, to achieve a maximum Annual Mean Concentration Target (AMCT) of 10 micrograms of $PM_{2.5}$ or below per cubic metre (µg/m3.' There will also be an interim target 'The highest annual mean concentration in the most recent full calendar year must not exceed 12 µg/m3 of $PM_{2.5}$.' The Hartlepool level for 2022 of 6.5 µg/m³ is well below the new targets.

Although the impact of the Coronavirus pandemic (COVID-19) was reduced, there were still implications on air quality measurements and reporting in Hartlepool during 2022. This included the total breakdown of monitoring equipment which resulted in no data being available for 2 automatic monitoring sites during the year. A comprehensive review of monitoring equipment was undertaken within the department and agreement obtained for new software/ monitoring equipment to be purchased for installation in 2023. Also 5 additional sites were identified for diffusion tubes which have now been installed and results will be available for 2023. Despite the challenges, officers within the Local Authority continue to monitor and work to improve air quality within the Borough.

Local Engagement and How to get Involved

There are many ways in which residents of Hartlepool can contribute to reducing the levels of air pollution within the Borough for example:

- Reducing the level of traffic on the roads by using alternative methods of transport such as walking or cycling which has benefits for health and wellbeing as well as the environment.

  Hartlepool is part of the "Let's Go Tees Valley" organisation which aims to change and improve the way members of the public travel around the region, making small changes to their everyday journeys. The organisation developed a Commuter Challenge during August 2018 to change the way you commute to work, encouraging car sharing, alternative modes of transport and health benefits of walking and cycling in the daily commute. Further information is available from:-

  https://www.letsgoteesvalley.co.uk/in-your-area/Hartlepool

- If you need to travel by car, consider joining a car sharing scheme. For information on car sharing please use the following link: www.liftshare.com
- Use public transport instead of private vehicles.
- If you intend to replace your existing vehicle then consider purchasing 'greener' vehicles such as hybrid and electric vehicles which will become more readily available in future years.
- Ensure that your vehicle is well maintained and keep tyre pressures properly inflated to manufacturer's recommendation. Drive more smoothly and avoid excessive speed, excessive braking and prolonged idling.
- After months of home working over the last two years, many residents may now have the opportunity to work from home either full time or on a hybrid basis which would lead to reduced traffic on our roads.
- Support local garden initiatives and plant more trees and greenery – and don't burn garden waste/rubbish in the garden – take it to the waste recycling centre.

Local Responsibilities and Commitment

This ASR was prepared by the Neighbourhoods and Regulatory Services Department (Environmental Protection Team) of Hartlepool Borough Council with the support and agreement of the following officers and departments:

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Paul Hurwood, (Environmental Services Manager), Neighbourhoods and Regulatory Services

Christopher Lau (Net Zero Officer), Development & Growth

Sylvia Pinkney (Assistant Director), Neighbourhoods and Regulatory Services

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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 Zoe Craig or Sylvia Tempest at:

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1 Local Air Quality Management

This report provides an overview of air quality in Hartlepool during 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.

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 Hartlepool 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 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.

Hartlepool Borough Council currently does not have any declared AQMAs. A draft local Air Quality Strategy has been produced and is undergoing a consultation process. Once approved the Air Quality Strategy will be available at: https://www.hartlepool.gov.uk.

Progress and Impact of Measures to address Air Quality in Hartlepool

DEFRA's appraisal of last year's ASR concluded that the report was well structured, detailed, and provided the information specified in the Guidance. The data was also deemed to be up to date and accurate.

Specific comments included:

It was encouraging to see that the Council had reviewed their monitoring programme and planned to at least double their non-automatic diffusion tube network in 2022.

QA/QC procedures were considered appropriate, with sufficient evidence for all calculations and reasoning provided in the appendix.

DEFRA welcomed that the report made reference to the Public Health Outcome Framework relating to air quality, providing a comparison of the estimated effects on annual mortality between Hartlepool and both the North East and England and also included the results from the new method of calculating the fraction of mortality attributable to particulate air pollution.

All graphs were well presented and are clear to read, with the addition of the AQO allowing for visual analysis of the monitoring data. Formatting is consistent between the graphs, and the Council have provided discussion of trends in the previous 5-year period.

Hartlepool Borough Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Hartlepool Cycle Clinic

Programme of Well-being Walks

Hartlepool Borough Council expects priority measures: replacement of air quality software/monitoring equipment, Net Zero/Climate Change Strategy and the Air Quality Strategy to be completed over the course of the next reporting year. The Public Health Strategy incorporating air quality issues will also be completed.

Hartlepool Borough Council worked to implement the measures in table 2.2 in partnership with the following stakeholders during 2022:

- Tees Valley Combined Authority
- Tees Valley Local Authorities
- Local Councillors
- Local bus companies
- Local taxi companies
- General Public

The principal challenges and barriers to implementation that Hartlepool Borough Council anticipates facing are lack of staff resources and funding.

Table 2.1 – 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	Tees Valley Strategic Transport Plan	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020	2023	Tees Valley Combined Authority (TVCA) and Tees Valley Local Authorities (TVLA)	Developers & highway infrastructure funding	NO	Funded	> £10 million	Implementation	Reduced vehicle emissions	Measured concentration of pollutants at local monitoring stations	Various projects completed and in progress	Lengthy Timescale
2	Update of air quality monitoring software/ equipment	Infrastructure	Other	2023	2023	HBC	HBC	NO	Funding approved	£10k - 50k	Planning	Effective and accurate measurement of pollutants	Software/equipment installed and operational	Agreement obtained for replacement software/ equipment.	
3	Net Zero and Climate Change Strategy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2022	2023	HBC	HBC	NO	Funded	£10k	Planning	Reduced vehicle emissions		Draft Strategy is being prepared	
4	Introduction of Air Quality Strategy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2022	2023	HBC and key stakeholders	HBC	NO	Funded	< £10k	Planning	Reduced vehicle emissions	Measured concentration at local monitoring stations	Draft Strategy approved for consultation on 13/03/23.	
5	Refuelling station serving hydrogen-powered vehicles based in the Tees Valley	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2020	2023	TVCA and TVLA	TVCA	NO	Not Funded	£1 million - £10 million	Completed	To provide infrastructure for using hydrogen vehicles	Measured concentration of pollutants at local monitoring stations	Hydrogen refuelling station is operational	Funding
6	Tees Valley Bus Improvement Plan.	Policy Guidance and Development Control	Low Emissions Strategy	2022	2027	TVCA, TVLA and bus companies	N/A	YES	Partially Funded	£1 million - £10 million	Implementation	Reduced vehicle emissions	Measured concentration of pollutants at local monitoring stations	Implementation on-going	First phase successful, second phase on-going
7	Continue to promote sustainable travel	Promoting Travel Alternatives	Promotion of walking	2018	ongoing	HBC, TVCA and Middlesbrough Environment City (MEC)	HBC/TVCA Capability funding	NO	Partially Funded	£100k - £500k	Implementation	Reduced vehicle emissions	Further investment in promoting travel alternatives	HBC is committed to promotion of sustainable travel measures and various initiatives have been progresse	

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
														d throughout 2022.	
8	Child pedestrian training delivered across all primary schools.	Promoting Travel Alternatives	Promotion of walking	2006	On-going	HBC, TVCA & MEC	Access/ Capability Funding	NO	Funded	£10k - 50k	Implementation	To encourage alternatives to vehicle use	To measure an increase in the number of participants	Implementation on-going	
9	Continue to promote sustainable travel	Promoting Travel Alternatives	Promotion of cycling	2018	ongoing	HBC, TVCA and Middlesbrough Environment City (MEC)	HBC/TVCA Capability funding	NO	Partially Funded	£100k - £500k	Implementation	Reduced vehicle emissions	Further investment in promoting travel alternatives	.	
10	E-scooter initiative	Promoting Low Emission Transport	Other	2021	2023	HBC	HBC/TVCA Capability funding	NO	Funded	< £10k	Completed	Reduced vehicle emissions	Measured concentration of pollutants at local monitoring stations	Currently there are over 50 defined 'parking spaces' where you can either pick up or leave a scooter.	
11	Cycle hub at Summerhill	Promoting Travel Alternatives	Promotion of cycling	2019	2022	HBC	HBC/TVCA Capability funding	NO	Fully funded	£100k - £500k	Implemented		Measured concentration of pollutants at local monitoring stations	completed	
12	Hybrid Working	Promoting Travel Alternatives	Encourage / Facilitate home-working	2020	On-going and now more stringent since the Covid-19 outbreak	HBC	HBC	NO	Funded	£10k - 50k	Implementation	Reduced vehicle emissions	Measured concentration of pollutants at local monitoring stations	A system of hybrid working is being incorporated into appropriate services	
13	Environmental Health Promotions	Public Information	Via the internet	2022	ongoing	HBC/AA	HBC	NO	Not Funded	< £10k	Implementation	Potential 10% reduction in fuel consumption	Measured concentration of pollutants at local monitoring stations	'Eco - driving tips' promotion. Leaflet produced and available on website	

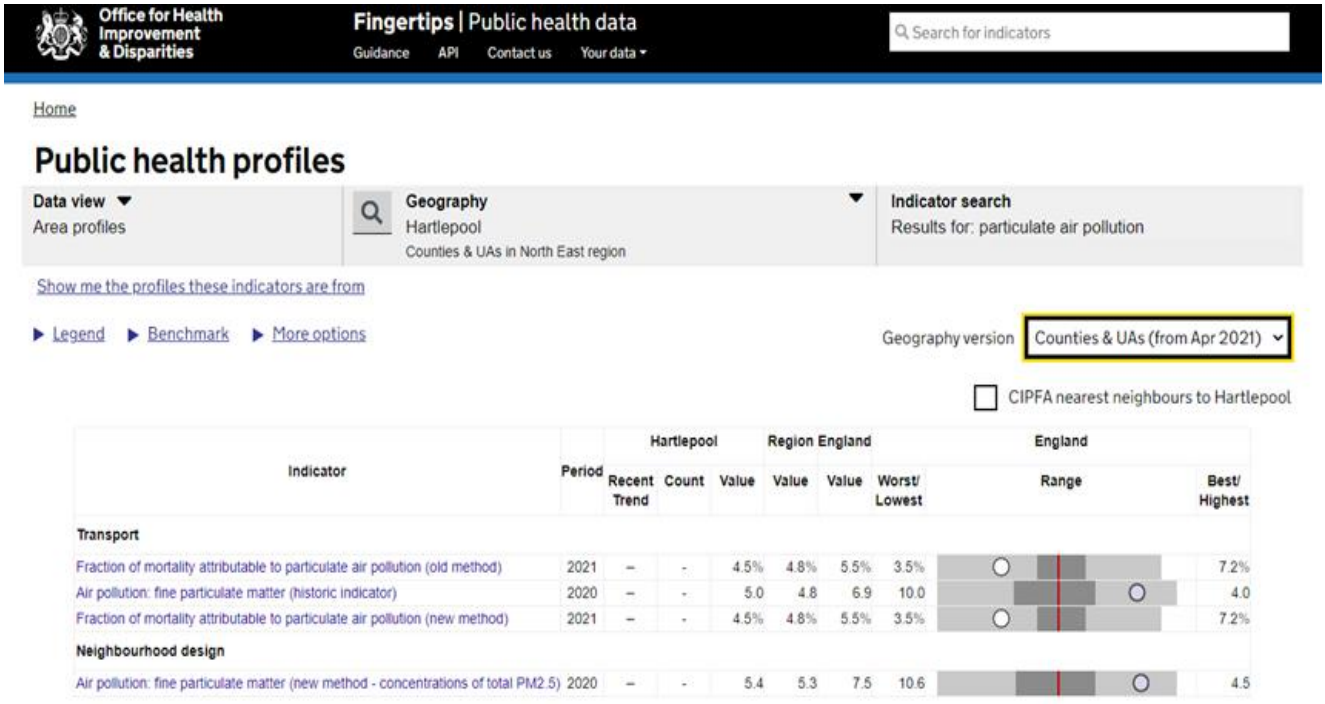
Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
14	Active participation in annual Clean Air Days	Public Information	Other	2023	ongoing	HBC	HBC	No	Not Funded	< £10k	Planning	Public awareness	Participation in annual Clean Air Days	To commence 2023	Officer time and resources
15	Campaign to provide information about the impacts of domestic burning and good practice, including wood burners and burning of garden waste	Public Information	Other	2023	2024	HBC	HBC	No	Not Funded	< £10k	Planning	Public awareness	Reduction in number of domestic burning complaints received. Measured concentration of pollutants	To commence 2023	Officer time and resources
16	Introduction of '20's Plenty' speed restriction zones to various areas and streets across the Borough	Promoting Low Emission Transport	Other	2012	ongoing	HBC	HBC	NO	Funded	< £10k	Implementation	Consistent, smooth driving at lower speeds can reduce vehicle emissions	No of 20s Plenty Zones in the Borough Measured concentration of pollutants at local monitoring stations	New 20mph speed limit approved for West Park area in 2022. Proposal for further scheme for Elwick Road being considered	All proposed schemes require approval from Council following public consultation exercise.
17	Public Health Strategy	Policy Guidance and Development Control	Low Emissions Strategy	2022	2023	HBC	HBC	NO	Funded	< £10k	Planning		Air quality integrated into other strategic policies	HBC are in the process of scoping and developing the public health strategy for 2023. Air quality will be referenced within that document.	

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
18	Licensed taxis to be minimum Euro 6 vehicles	Promoting Low Emission Transport	Taxi Licensing conditions	2021	2025	HBC/local taxi drivers and companies	HBC	NO	Funded	< £10k	Planning	Reduced vehicle emissions	No of taxis compliant	Initial report to licensing Committee on 25th June 2021 proposed to introduce these measures on 1st April 2023 - the proposed implementation date has now been postponed until 2025	Resistance from taxi trade to upgrade to low emission vehicles. Ability to regulate has significantly reduced since government de-regulation and the ability for drivers to obtain licences at unconnected LAs

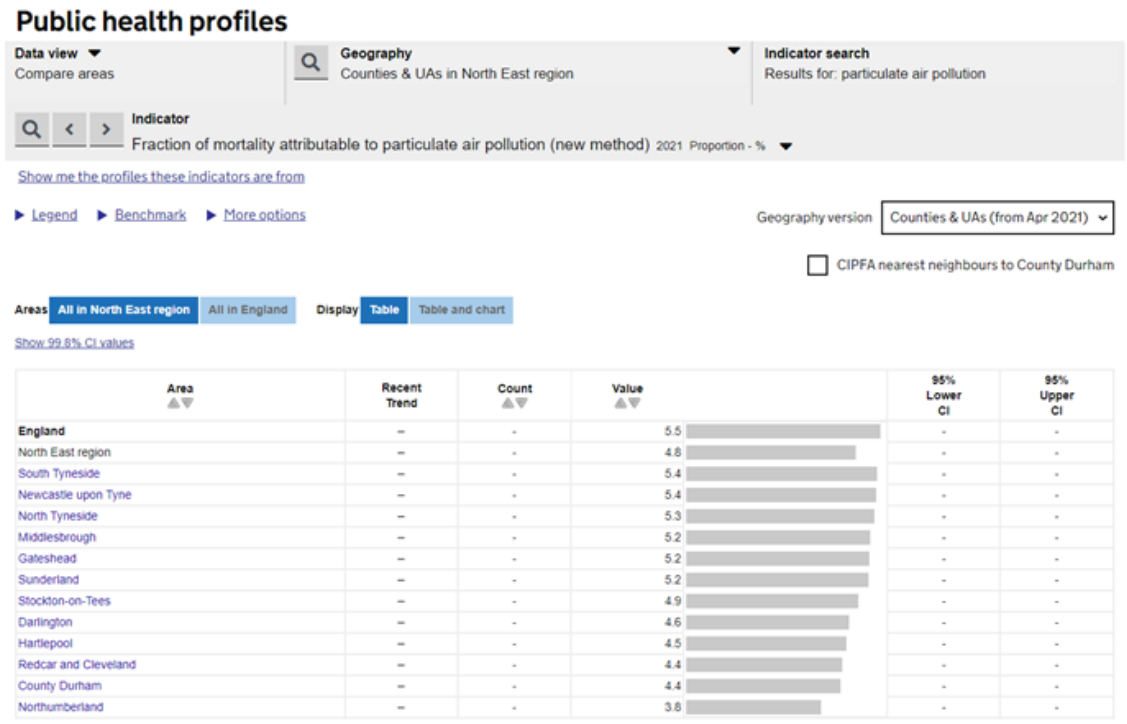
$PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

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 latest data available on the Public Health England website as displayed below states that the fraction of mortality attributed to particulate air pollution within Hartlepool is 4.5% which is lower than the overall value for England which is 5.5% and also lower than the North East Region (4.8%).



Indicator	Period	Hartlepool Recent Trend	Hartlepool Count	Hartlepool Value	Region Value	England Value	England Worst/ Lowest	England Range	England Best/ Highest
Transport									
Fraction of mortality attributable to particulate air pollution (old method)	2021	–	-	4.5%	4.8%	5.5%	3.5%		7.2%
Air pollution: fine particulate matter (historic indicator)	2020	–	-	5.0	4.8	6.9	10.0		4.0
Fraction of mortality attributable to particulate air pollution (new method)	2021	–	-	4.5%	4.8%	5.5%	3.5%		7.2%
Neighbourhood design									
Air pollution: fine particulate matter (new method - concentrations of total PM2.5)	2020	–	-	5.4	5.3	7.5	10.6		4.5



Public health profiles

Data view: Compare areas | Geography: Counties & UAs in North East region | Indicator search: Results for: particulate air pollution

Indicator: Fraction of mortality attributable to particulate air pollution (new method) 2021 Proportion - %

Show me the profiles these indicators are from

Legend | Benchmark | More options

Geography version: Counties & UAs (from Apr 2021)

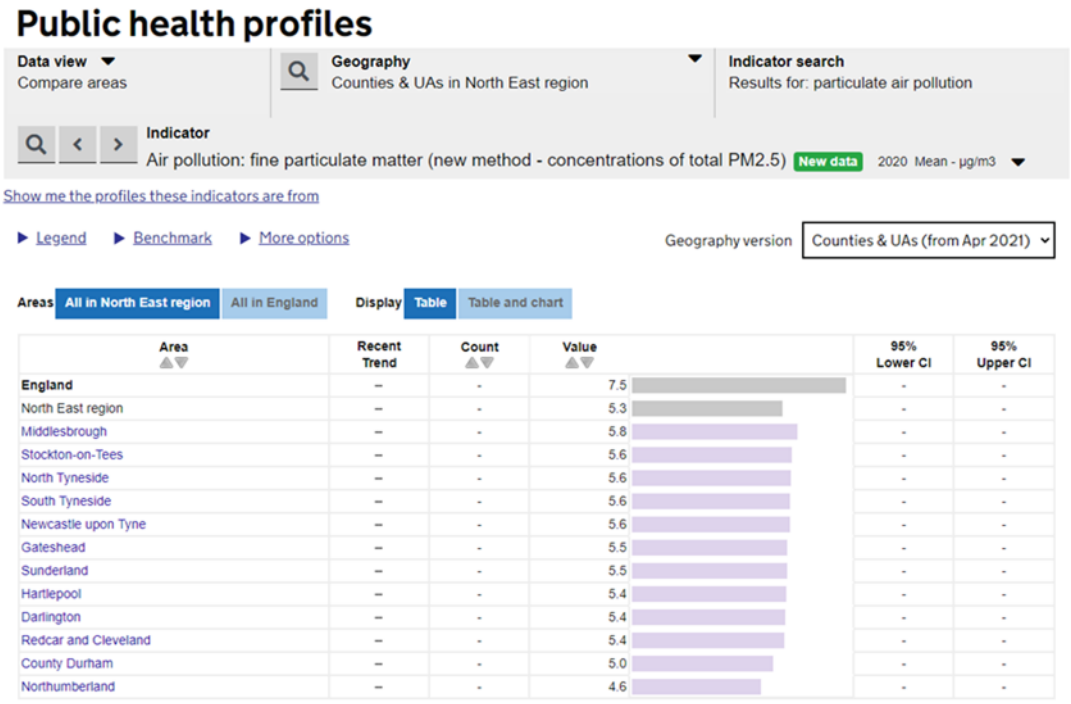
CIPFA nearest neighbours to County Durham

Areas: All in North East region | All in England Display: Table | Table and chart

Show 99.8% CI values

Area	Recent Trend	Count	Value	95% Lower CI	95% Upper CI
England	–	-	5.5	-	-
North East region	–	-	4.8	-	-
South Tyneside	–	-	5.4	-	-
Newcastle upon Tyne	–	-	5.4	-	-
North Tyneside	–	-	5.3	-	-
Middlesbrough	–	-	5.2	-	-
Gateshead	–	-	5.2	-	-
Sunderland	–	-	5.2	-	-
Stockton-on-Tees	–	-	4.9	-	-
Darlington	–	-	4.6	-	-
Hartlepool	–	-	4.5	-	-
Redcar and Cleveland	–	-	4.4	-	-
County Durham	–	-	4.4	-	-
Northumberland	–	-	3.8	-	-

A new measure for 2021 (based on 2020 data) is fine particulate matter – concentrations of total $PM_{2.5}$. Results shows that for this measure, levels within Hartlepool were 5.4µg/m^3 which is lower than the overall value for England (7.5µg/m^3) and slighter higher than the rate for the North East Region (5.3µg/m^3).



Public health profiles

Data view: Compare areas | Geography: Counties & UAs in North East region | Indicator search: Results for: particulate air pollution

Indicator: Air pollution: fine particulate matter (new method - concentrations of total PM2.5) New data 2020 Mean - µg/m3

Show me the profiles these indicators are from

Legend | Benchmark | More options

Geography version: Counties & UAs (from Apr 2021)

Areas: All in North East region | All in England Display: Table | Table and chart

Area	Recent Trend	Count	Value	95% Lower CI	95% Upper CI
England	–	-	7.5	-	-
North East region	–	-	5.3	-	-
Middlesbrough	–	-	5.8	-	-
Stockton-on-Tees	–	-	5.6	-	-
North Tyneside	–	-	5.6	-	-
South Tyneside	–	-	5.6	-	-
Newcastle upon Tyne	–	-	5.6	-	-
Gateshead	–	-	5.5	-	-
Sunderland	–	-	5.5	-	-
Hartlepool	–	-	5.4	-	-
Darlington	–	-	5.4	-	-
Redcar and Cleveland	–	-	5.4	-	-
County Durham	–	-	5.0	-	-
Northumberland	–	-	4.6	-	-

Further information on this data can be found on Public Health England's Website using the link below:

https://fingertips.phe.org.uk/search/particulate%20air%20pollution#page/3/gid/1/pat/6/par/E12000001/ati/102/are/E06000047/iid/30101/age/230/sex/4/cid/4/tbm/1

Since mid- 2022, monitoring of particulate $PM_{2.5}$ is now carried out at the St Abbs Walk monitoring station in Hartlepool. Previously calculations were undertaken using actual monitored levels at Redcar and Cleveland, Stockton and Middlesbrough sites and a nationally derived factor and applying that to the particulate PM10 results at the Stockton Road and Headland site.

Government objectives have consistently been easily met where relevant public exposure exists and this is expected to continue. Hartlepool council will continue to work and co-operate with the four other Tees Valley councils in trying to identify in more detail sources of fine particles, and see if any local action can cost effectively reduce emissions / concentrations.

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

This section sets out the monitoring undertaken within 2022 by Hartlepool Borough Council 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

Hartlepool Borough Council has two continuous monitoring stations, one alongside the busy main A689 Stockton Road (Barra Grove) leading into Hartlepool and measuring nitrogen dioxide and particulate PM10, the other alongside the working port area on the Headland (Town Wall) measuring particulate PM10 only. The Headland station is a site specific location for port activity. Hartlepool Borough Council was unable to undertake monitoring at either of these sites during 2022 due to breakdown of the monitoring equipment. However, an additional automatic monitoring site was installed by DEFRA in October 2017 at St Abbs Walk and measures continuous urban background NO2, PM10 and PM2.5 as part of the Automatic Urban Rural Network (AURN). Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem.

The Data Selector - DEFRA, UK page presents automatic monitoring results for Hartlepool Borough Council, with automatic monitoring results also available through the UK Air Website:

https://uk-air.defra.gov.uk/networks/network-info?view=aurn

A map showing the location of the monitoring sites is 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

Hartlepool Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 3 sites during 2022. In addition 5 further sites were identified and diffusion tubes installed in readiness for monitoring to commence in 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

The map showing the location of the monitoring sites is 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.

Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare 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).

For diffusion tubes, the full 2022 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 NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

There have been no exceedances of the annual mean or 1 hour mean objectives at any monitoring location.

3.1.3 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

There have been no exceedances of the annual mean objective.

3.1.4 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.

This is the first measurement in Hartlepool that has not been calculated from a derived figure using neighbouring local Authorities data. The measured level was 6.5 µg/m3. There is no national air quality objective for $PM_{2.5}$.

3.1.5 Sulphur Dioxide (SO_2)

Hartlepool Borough Council no longer monitors sulphur dioxide concentrations, and there is no requirement to do so in the absence of industrial sources or significant domestic coal burning. Hartlepool Borough Council did monitor sulphur dioxide concentrations at the Stockton Road station until 2007 and results were significantly and consistently below the air quality objective. Sulphur dioxide monitoring results from other Tees Valley Councils with significant emissions from the chemical and steel industries, consistently show the objectives being met, and this will also be the case within the Hartlepool area.

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?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
A1 Stockton Road	Stockton Road (Barra Grove)	Roadside	450300	529700	NO_2; PM_{10}	NO	Chemiluminescent; Beta Attenuated	10	12	2
A2 Headland	Headland (Town Wall)	Other	452400	533600	PM_{10}	NO	Beta Attenuated	10	5	2
A3 St Abbs Walk	St Abbs Walk (AURN)	Urban Background	451429	532312	NO_2, PM_{10}, $PM_{2.5}$	NO	Chemiluminescent	6.5	6	2

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)
S1	Powlett Road	Roadside	450400	533900	NO2	NO	0	5	NO	2.5
S2	King Oswy Drive	Roadside	449600	535950	NO2	NO	0	5	NO	2.5
S3	Fens Crescent	Roadside	449600	529100	NO2	NO	0	5	NO	2.5
*S4	Seaton Carew	Roadside	452502	529935	NO2	NO	1.6	1.5	NO	2.2
*S5	Oxford Rd	Roadside	449385	531076	NO2	NO	14	2.8	NO	2.3
*S6	Colwyn Road	Roadside	450605	531785	NO2	NO	0	1.6	NO	2.2
*S7	Cleveland Rd	Roadside	451292	534303	NO2	NO	21	2.1	NO	2.4
*S8	Hart Village	Roadside	447343	534962	NO2	NO	0	2.4	NO	2.3

*New diffusion tube placed in position prior to commencement of monitoring in 2023

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 NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
A1 Stockton Road	450300	529700	Roadside	0	0	17.9	13.9	7.6	12.1	-
A3 St Abbs Walk	451429	532312	Urban Background	99	99	13	12.3	9.9	10.3	10.4

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

☒ **Reported concentrations are those at the location of the monitoring site (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**.

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%).

Table A.4 – 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 (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
S1	450400	533900	Roadside	92.3	92.3	7.5	13.4	9.7	11.6	11.8
S2	449600	535950	Roadside	84.6	84.6	6.9	13.1	8.6	9.2	11
S3	449600	529100	Roadside	100	100	7.8	14.2	10.7	11.9	13.2
*S4	452502	529935	Roadside	N/A	N/A	-	-	-	-	-
*S5	449385	531076	Roadside	N/A	N/A	-	-	-	-	-
*S6	450605	531785	Roadside	N/A	N/A	-	-	-	-	-
*S7	451292	534303	Roadside	N/A	N/A	-	-	-	-	-
*S8	447343	534962	Roadside	N/A	N/A	-	-	-	-	-

*New diffusion tube placed in position prior to commencement of monitoring in 2023

☒ **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 **bold and underlined**.

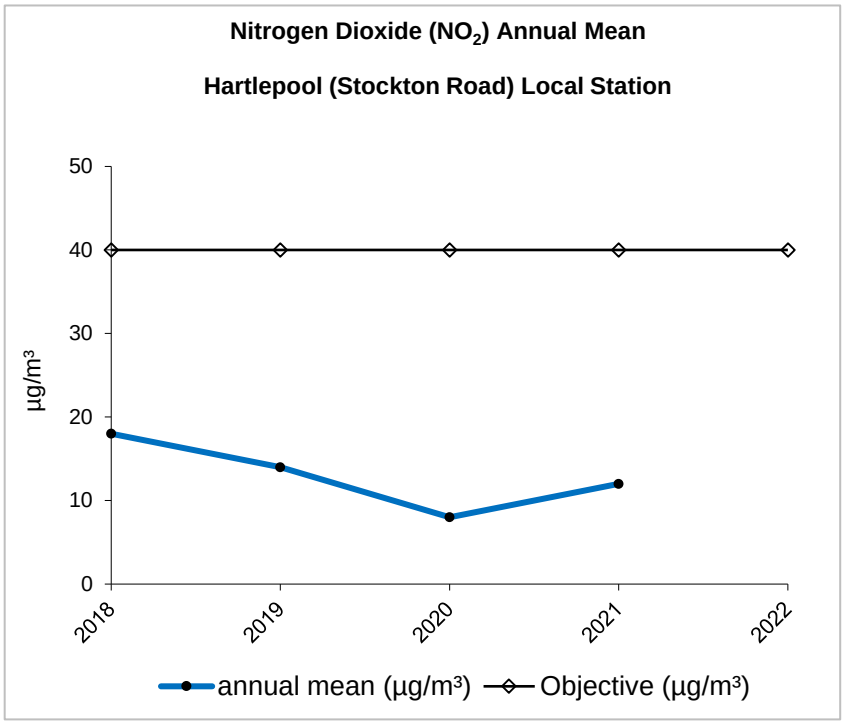
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

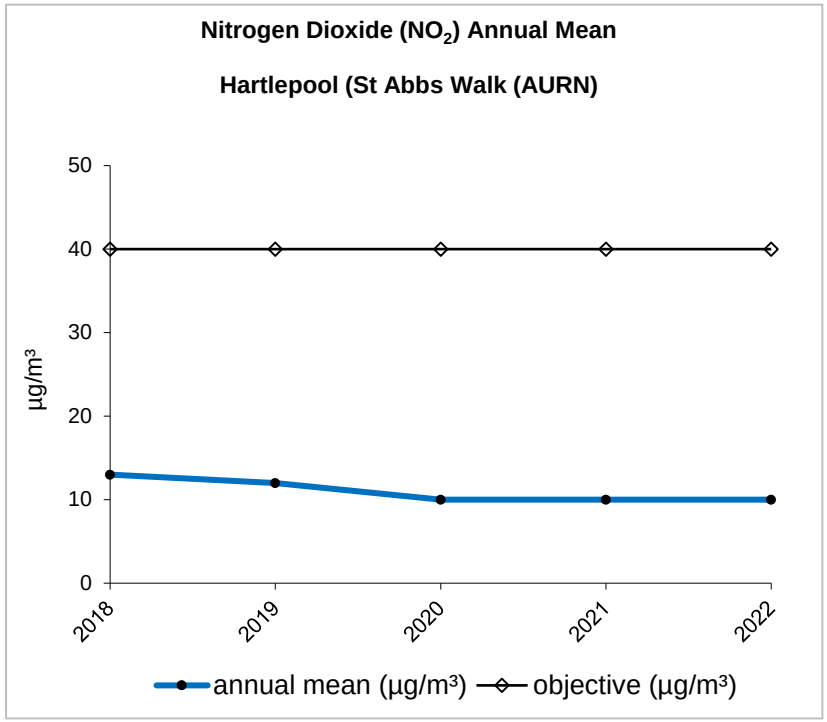
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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 NO_2 Concentrations





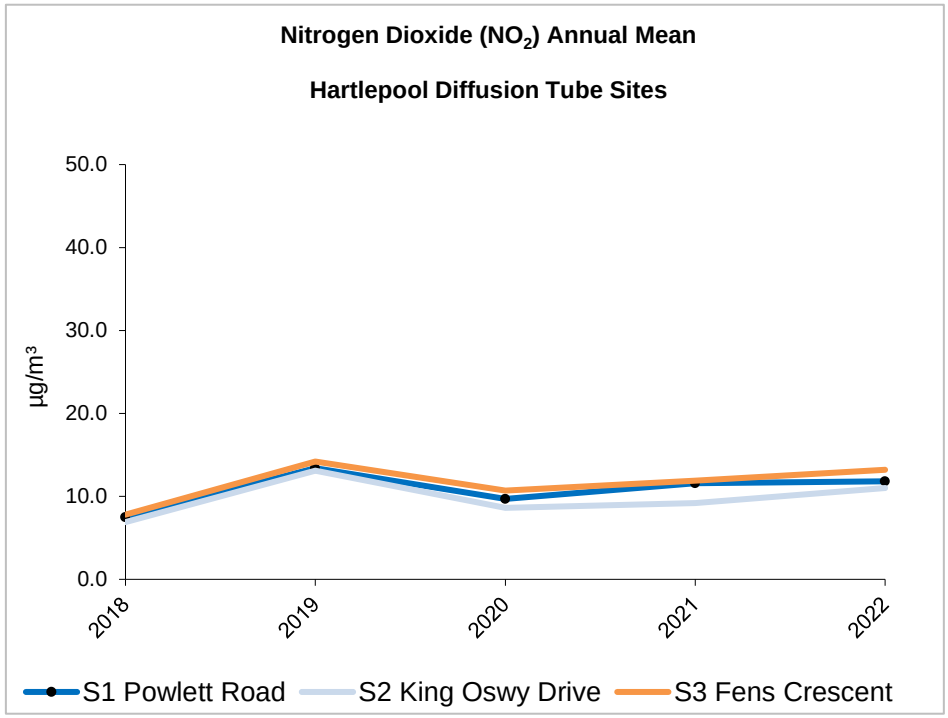

Nitrogen Dioxide (NO_2) Annual Mean
Hartlepool Diffusion Tube Sites
50.0
40.0
30.0
20.0
10.0
0.0
µg/m³
2018
2019
2020
2021
2022
S1 Powlett Road
S2 King Oswy Drive
S3 Fens Crescent

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
A1 Stockton Road	450300	529700	Roadside	0	0	0	0	0 (60)	0 (49)	-
A3 St Abbs Walk	451429	532312	Urban Background	99	99	0	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

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

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%).

Figure A.2 – Trends in Number of NO_2 1-Hour Means > 200µg/m^3

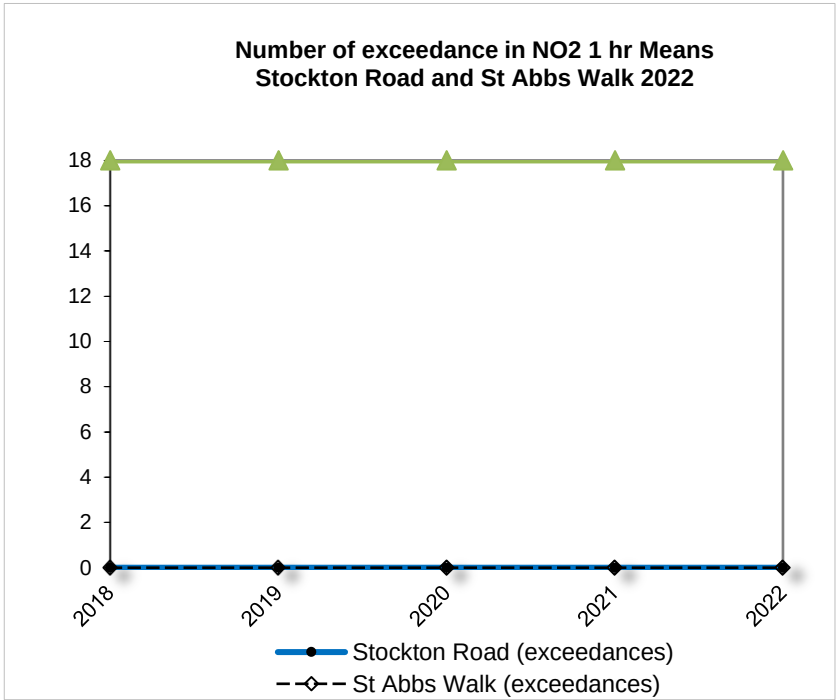


Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
A1 Stockton Road	450300	529700	Roadside	0	0	26.6	25.3	23.7	22.9	-
A2 Headland	452400	533600	Other	0	0	27.3	29.7	29.7	26.3	-
A3 St Abbs Walk	451429	532312	Urban Background	99	63.4	-	-	-	-	11.6

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

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

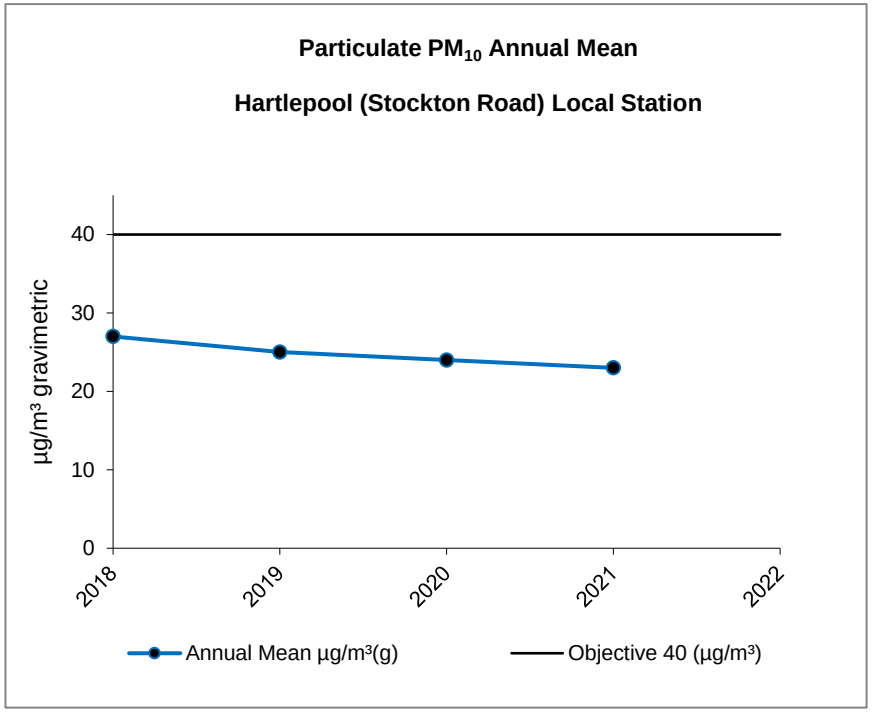
Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold**.

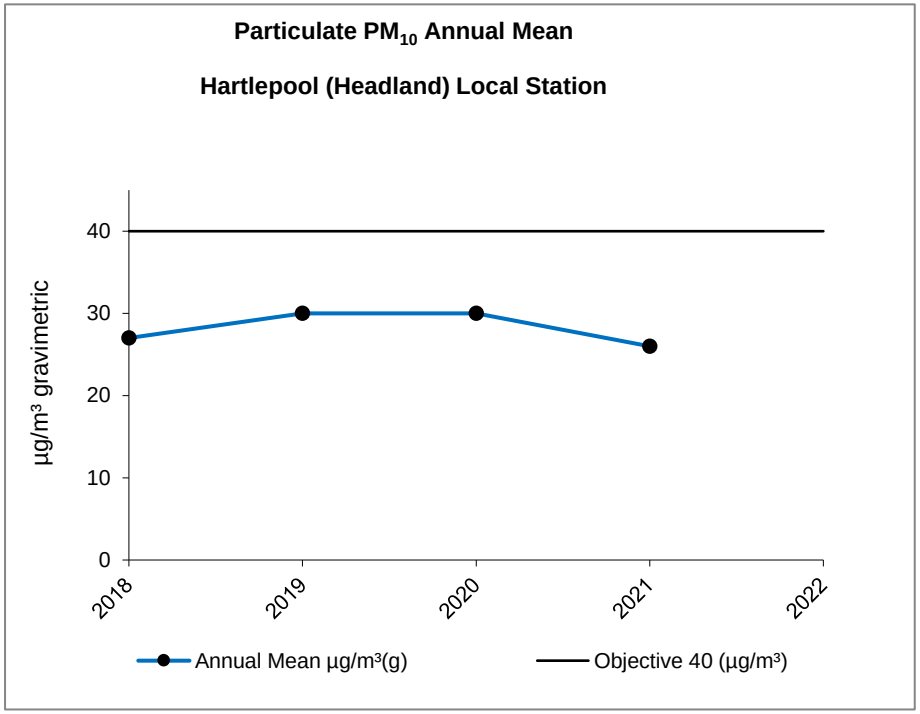
All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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.3 – Trends in Annual Mean PM_{10} Concentrations





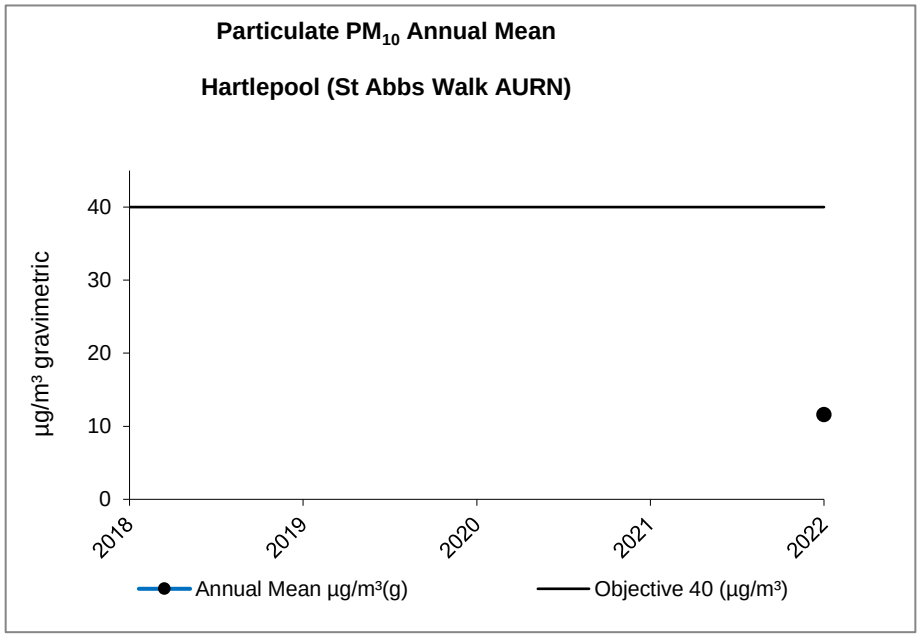

Particulate PM10 Annual Mean
Hartlepool (St Abbs Walk AURN)
µg/m³ gravimetric
40
30
20
10
0
2018
2019
2020
2021
2022
Annual Mean µg/m³(g)
Objective 40 (µg/m³)

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
A1 Stockton Road	450300	529700	Roadside	0	0	9(38)	5(38)	1(33)	0(34)	-
A2 Headland	452400	533600	Other	0	0	12	13(46)	20	5(41)	-
A3 St Abbs Walk	451429	532312	Urban Background	99.1	63.4	-	-	-	-	0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

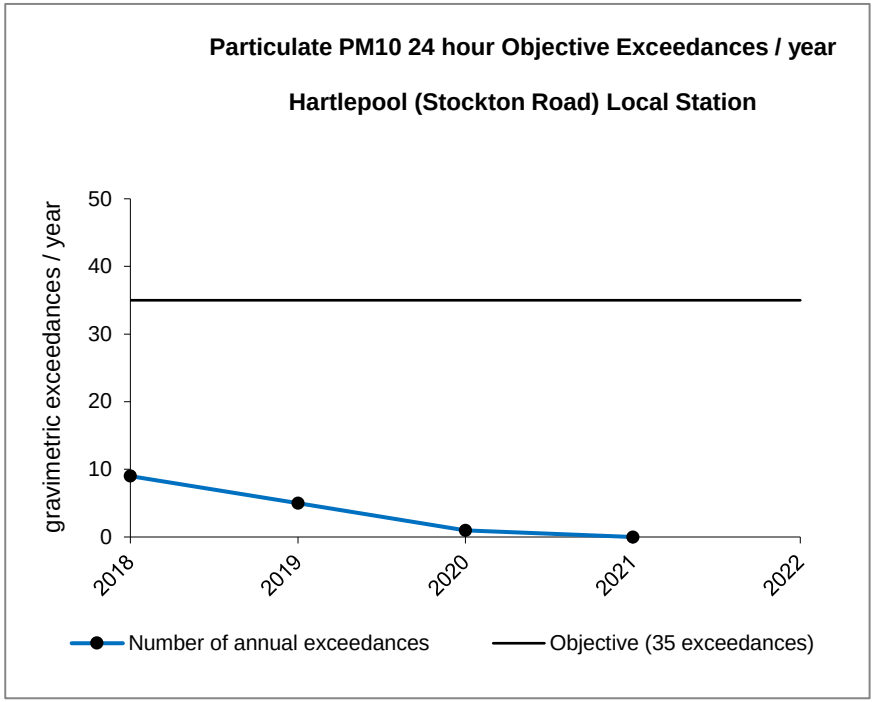
Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

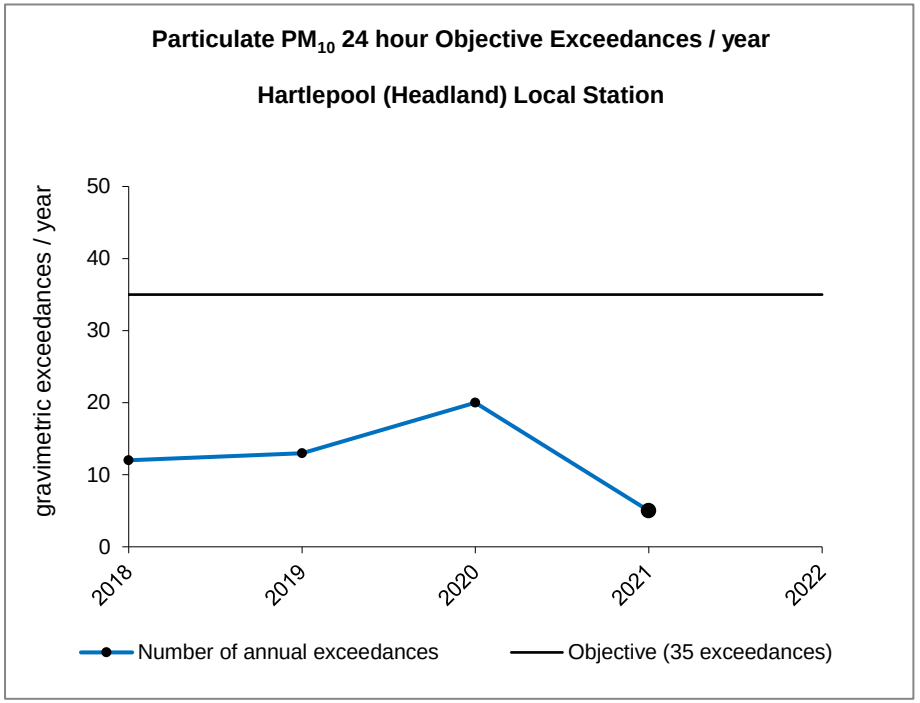
If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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%).

Figure A.4 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m^3





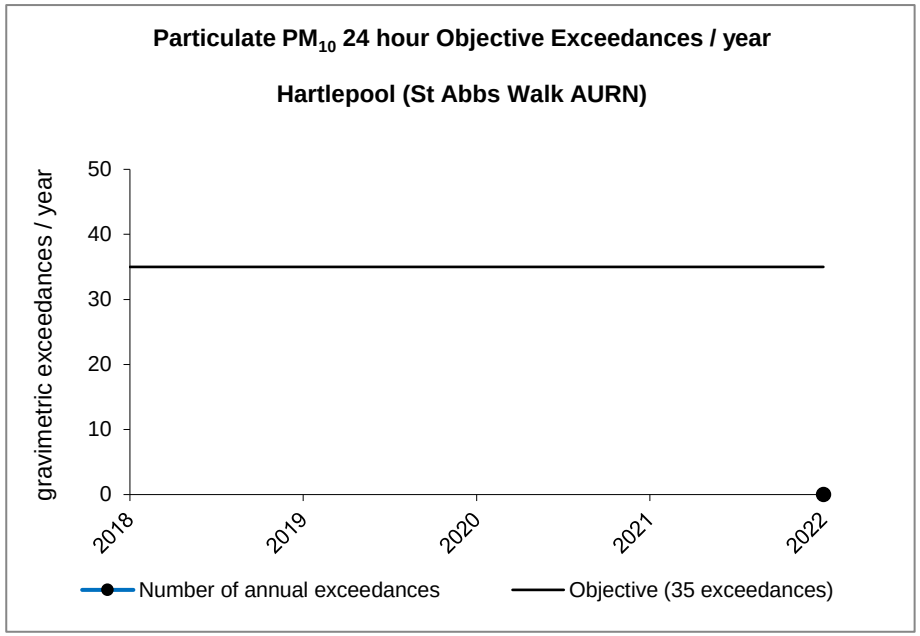

Particulate PM10 24 hour Objective Exceedances / year
Hartlepool (St Abbs Walk AURN)
gravimetric exceedances / year
50
40
30
20
10
0
2018
2019
2020
2021
2022
Number of annual exceedances
Objective (35 exceedances)

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
A1 Stockton Road	450300	529700	Roadside	0	0	18.6	18.9	16.6	16	-
A2 Headland	452400	533600	Other	0	0	19.1	22.2	20.8	18.4	-
A3 St Abbs Walk	451429	532312	Urban Background	99.1	63.4	-	-	-	-	6.5

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

Notes:

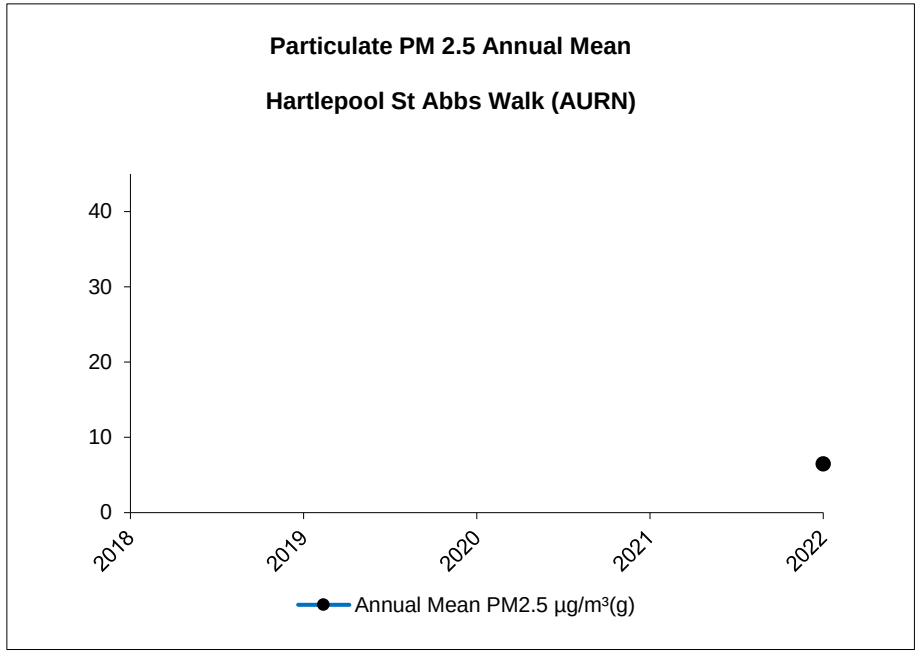
The annual mean concentrations are presented as $\mu g/m^3$.

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.

(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.5 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results (µg/m^3)

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 (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S1	450400	533900	19	17	18.5	12.9	9.5	9.4	10.8	-	14.7	16.9	19.8	20.2	15.3	11.8	-	Tube missing on collection in August
S2	449600	535950	18.4	15.1	17.5	10.3	8.7	9.6	11.3	-	-	15.3	19	18.1	14.3	11	-	Water in tube August and September
S3	449600	529100	25.6	19.8	19.9	13	11.9	12.3	11.3	12.1	14.8	18.3	22.8	23.8	17.1	13.2	-	*
*S4	452502	529935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
*S5	449385	531076	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
*S6	450605	531785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
*S7	451292	534303	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
*S8	447343	534962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*

*New diffusion tube placed in position prior to commencement of monitoring in 2023

☒ **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.**

☒ **Hartlepool Borough 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 Hartlepool Borough Council During 2022

Hartlepool Borough Council have identified the following planning approvals for residential dwellings within the reporting year of 2022 which may affect air quality.

H/2020/0300 **Planning Permission Approved** **27/05/2022**	**FORMER GARDEN CENTRE, TANFIELD ROAD HARTLEPOOL, TS25 5DD** Residential development comprising 17no. bungalows including car parking, new access road and associated works.
H/2021/0115 **Planning Permission Approved** **14/03/2022**	**LAND OFF CONISCLIFFE ROAD, (MAYFAIR GARDENS) HARTLEPOOL** Variation to allow for substitution of house types at plots 11, 26 and 30, alterations to private driveways at plots 38 and 39.
H/2021/0282 **Planning Permission Approved** **18/01/2022** **Air Quality Assessment provided.**	**LAND NORTH OF DUCHY HOMES, WYNYARD PARK ESTATE, WYNYARD** Outline Planning Permission with all matters reserved except for access for the erection of 25no. residential plots (use class C3) with associated access (Amended site location plan and reduction in the number of dwellings from 29no. to 25no).
H/2022/0140 **Planning Permission Approved** **05/09/2022**	**PLOT 16, THE CAVENDISH, WYNYARD** Application for access for the erection of 25no. residential plots (use class C3) with associated access
H/2021/0498 **Planning Permission Approved** **23/02/2022** **Air Quality Assessment provided.**	**LAND EAST OF BRENDA ROAD, SOUTH OF SEATON LANE, (FORMER EWART PARSONS SITE) HARTLEPOOL** Demolition of all existing buildings and erection of 234no. New dwellings and associated infrastructure and landscaping.

Additional Air Quality Works Undertaken by Hartlepool Borough Council During 2022

In 2022 Hartlepool Borough Council agreed to replace the monitoring equipment at two automatic monitoring sites - Stockton Road and the Headland. There have been problems over the last few years with obtaining information from the sites and the decision was made to completely renew the equipment to ensure accuracy and consistency going forward. This equipment will be commissioned and installed in 2023. 5 new diffusion tubes have also been purchased and installed and will provide information for the ASR 2023.

QA/QC of Diffusion Tube Monitoring

Hartlepool Borough Council nitrogen dioxide diffusion tube programme is operated through an approved laboratory (SOCOTEC, Didcot) with formal accreditation to BS standards and one that participates in the AIR-PT programme. Particular attention is paid to correct installation of the tubes at site and reliable exposure duration.

Tube precision for this laboratory is consistently shown as good for tube preparation 50% TEA in acetone. As can be seen from the table below SOCOTEC are considered to be satisfactory as they have 100% across their most recent six tube rounds where data was available - this indicates that diffusion tube results should be accurate to within +/- 2%.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Hartlepool recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

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

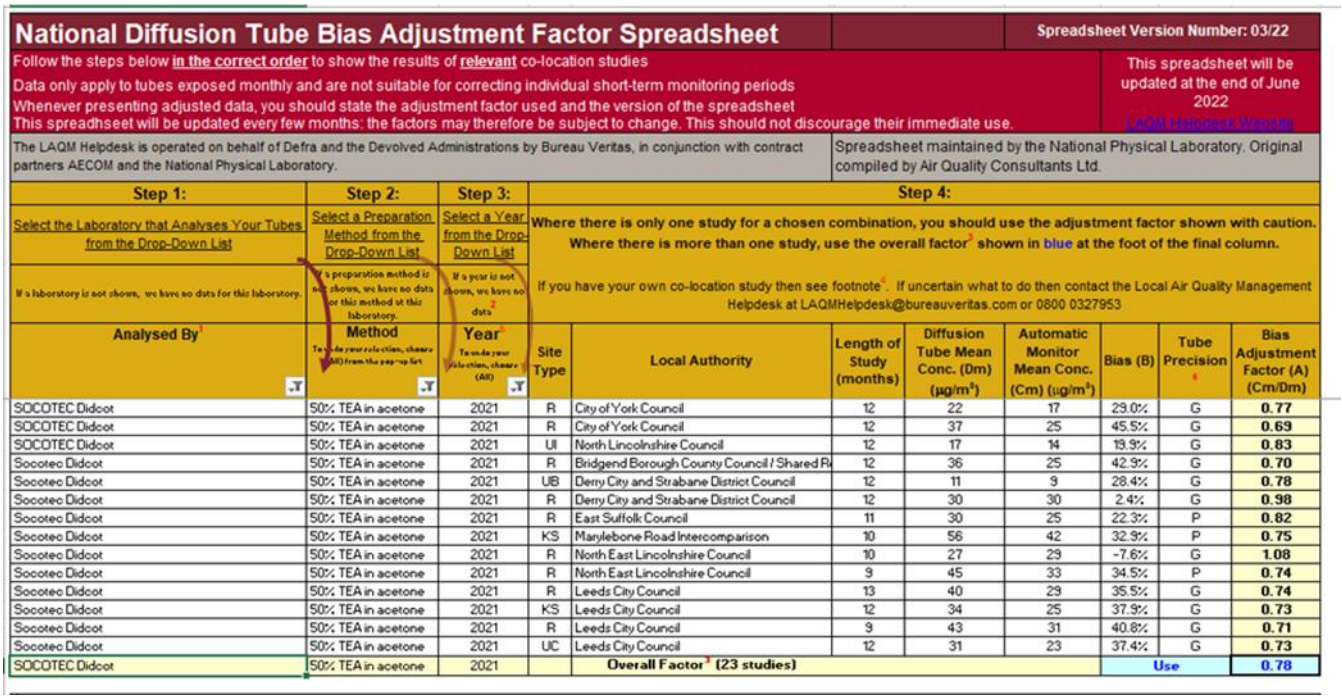
Site ID	Annualisation Factor Redcar and Cleveland	Annualisation Factor Stockton –on-tees	Annualisation Factor Middlesbrough	Average Annualisation Factor	Raw Data Annual Mean (µg/m3)	Annualised Annual Mean (µg/m^3)
A3 St Abbs Walk (PM_{10})	1.10	0.75	0.81	0.88	13.10	11.53
A3 St Abbs Walk ($PM_{2.5}$)	1.24	0.83	0.82	0.96	6.76	6.49

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.

Hartlepool Borough Council have applied a National bias adjustment factor of 0.78 to the 2022 monitoring data. The national bias adjustment factor was derived using the 'National Diffusion Tube Bias Adjustment Factor Spreadsheet 03/22 which produced a bias adjustment factor of 0.78 following 23 studies.

Hartlepool Borough Council has chosen to use a national bias adjustment factor for the 2021 data; which factor has been used for the previous 5 years. The national bias adjustment factor has been selected on the basis that it includes 23 sites which reflects a larger sample size than would be possible for a local bias-adjustment factor in the Borough.



National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/22

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet

This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2022

LAQM Helpdesk Website

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

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

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data

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

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

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)
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	22	17	29.0%	G	**0.77**
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	37	25	45.5%	G	**0.69**
SOCOTEC Didcot	50% TEA in acetone	2021	UI	North Lincolnshire Council	12	17	14	19.9%	G	**0.83**
Socotec Didcot	50% TEA in acetone	2021	R	Bridgend Borough County Council / Shared R	12	36	25	42.9%	G	**0.70**
Socotec Didcot	50% TEA in acetone	2021	UB	Derry City and Strabane District Council	12	11	9	28.4%	G	**0.78**
Socotec Didcot	50% TEA in acetone	2021	R	Derry City and Strabane District Council	12	30	30	2.4%	G	**0.98**
Socotec Didcot	50% TEA in acetone	2021	R	East Suffolk Council	11	30	25	22.3%	P	**0.82**
Socotec Didcot	50% TEA in acetone	2021	KS	Marylebone Road Intercomparison	10	56	42	32.9%	P	**0.75**
Socotec Didcot	50% TEA in acetone	2021	R	North East Lincolnshire Council	10	27	29	-7.6%	G	**1.08**
Socotec Didcot	50% TEA in acetone	2021	R	North East Lincolnshire Council	9	45	33	34.5%	P	**0.74**
Socotec Didcot	50% TEA in acetone	2021	R	Leeds City Council	13	40	29	35.5%	G	**0.74**
Socotec Didcot	50% TEA in acetone	2021	KS	Leeds City Council	12	34	25	37.9%	G	**0.73**
Socotec Didcot	50% TEA in acetone	2021	R	Leeds City Council	9	43	31	40.8%	G	**0.71**
Socotec Didcot	50% TEA in acetone	2021	UC	Leeds City Council	12	31	23	37.4%	G	**0.73**
SOCOTEC Didcot	50% TEA in acetone	2021		**Overall Factor (23 studies)**				Use		**0.78**

A summary of bias adjustment factors used by Hartlepool Borough Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/22	0.78
2021	National	03/22	0.78
2020	National	09/21	0.76
2019	National	-	0.75
2018	National	-	0.77

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been 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.

No diffusion tube NO_2 monitoring locations within Hartlepool Borough Council required distance correction during 2022.

QA/QC of Automatic Monitoring

The two Hartlepool fixed continuous Local monitoring stations (one NO_2 and PM_{10}, the other PM_{10}), are modern installations, and have been operated under a comprehensive service contract. Operators of the site have received supplier training.

The Council is committed to achieving accuracy, precision, data capture, traceability and long term consistency to ensure that data is representative of ambient air quality. In common with other Tees Valley Councils, Hartlepool has a documented quality assurance and control programme, which includes an established schedule of regular site calibrations, validation of data, and documentation of all procedures.

Details are summarised as follows:

Calibration gas is obtained from approved gas standard suppliers. Equipment has a comprehensive service agreement with the supplier.

Data capture site operators are experienced and trained personnel, monitoring data capture on a daily basis where possible to ensure that faults are detected and corrected quickly.

Ratification data is screened, where possible on a daily basis, to check for unusual measurements. Suspicious data is investigated fully, and if found to be faulty, is deleted from the records. Particular attention is paid to possible environmental changes in the vicinity of the analyser.

Data is recorded monthly and compared with earlier results.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The Stockton Road and Headland PM_{10} monitors are BAM units adjusted to full gravimetric equivalence by dividing the raw data by 1.21.

Automatic Monitoring Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%.

The data has been annualised using the results at three Tees Valley continuous monitoring sites, in accordance with LAQM.TG22. Details of the sites and the data are displayed in Table C.1

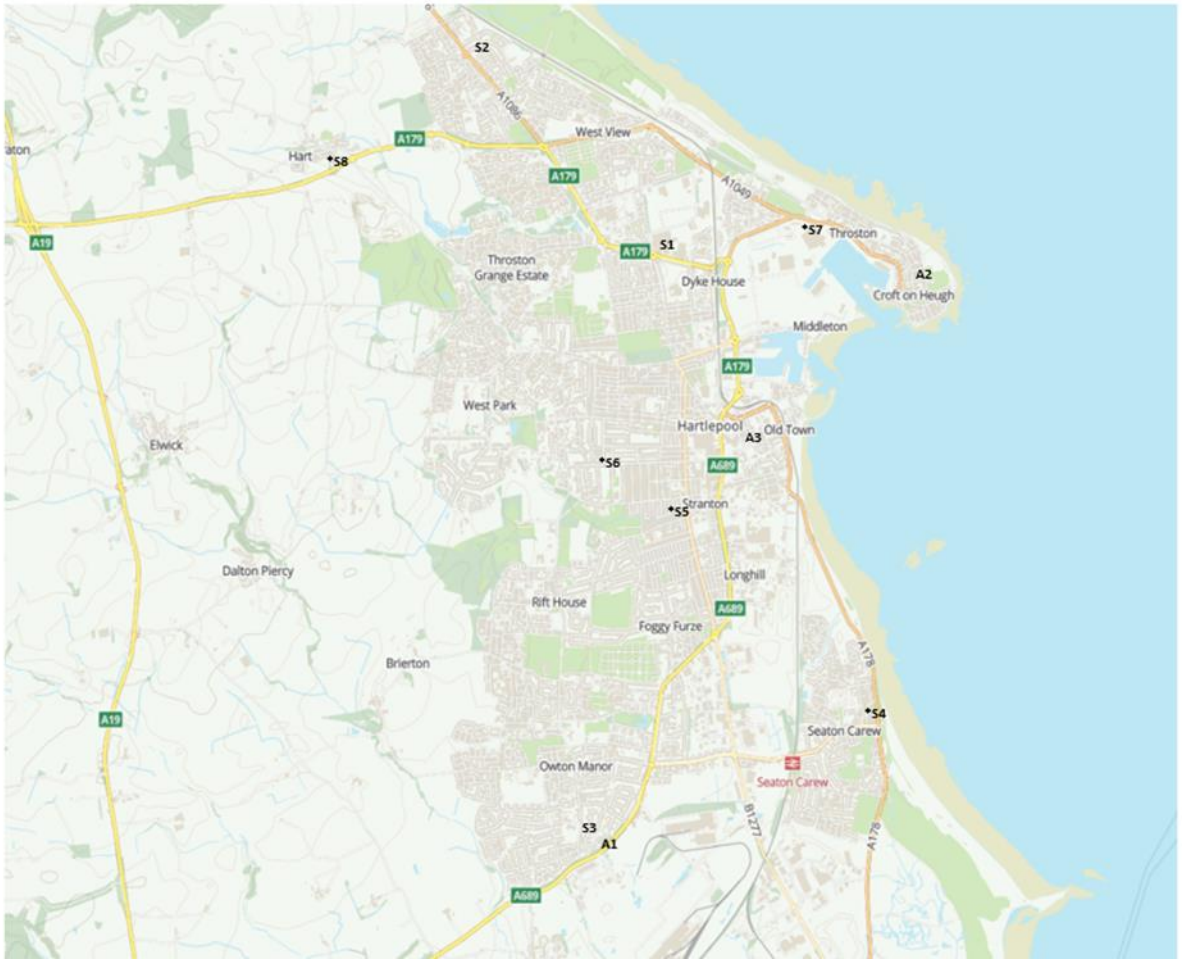
NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the 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.

No automatic NO_2 monitoring locations within Hartlepool Borough Council required distance correction during 2022.

Appendix D: Map of Monitoring Locations

Figure D.1 – Map of Monitoring Sites



Key:

Automatic Monitoring Sites:

A1- Stockton Road, A2 - Headland, A3 - St Abbs Walk.

Existing Diffusion Tubes:

S1 - Powlett Road, S2 - King Oswy Drive, S3 - Fens Crescent

New Diffusion Tubes (to commence monitoring 2023):

*S4 - Seaton Carew, *S5 - Oxford Road, *S6 - Colwyn Road, *S7 – Cleveland Road, *S8 - Hart Village

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[9]

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

[9] 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
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
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

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- Tees Valley Combined Authority, Strategic Transport Plan, Available At: *https://teesvalley-ca.gov.uk/wp-content/uploads/2020/02/STP-Main-Report-Design-Jan20.pdf*
- UK Air Information Resource (AIR), 'Data Selector', Department of Environment Food & Rural Affairs; Available At: *https://uk-air.defra.gov.uk/data/data_selector_service?q=3275829#mid*
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