

AIR QUALITY

REPORT OF: Tom Clark, Head of Regulatory Services.
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Wards Affected: ALL
Key Decision: No
Report to: Scrutiny Committee for Community, Customer Services and Service Delivery
5th February 2020

Purpose of Report

1. To inform Members about our Annual Status Report on air quality and highlight the air quality programme across the District.

Recommendations

The Committee is recommended to endorse the approach of the Council on Air Quality Management.

Background

2. Statutory responsibility for monitoring and assessing air quality sits with the Council under Part IV of the Environment Act 1995. Areas where pollutants exceed, or are likely to exceed, Government health based air quality objectives are declared as Air Quality Management Areas (AQMA) and we are required to produce an air quality Action plan (AQAP) to demonstrate how we will improve air quality in the AQMA. Councils are also required to produce an Annual Status Report (ASR) for the Department of Environment, Food and Rural Affairs (Defra) for their approval.
3. Where air quality problems resulting in AQMA are related to traffic, which is the case for all AQMA in West Sussex, West Sussex County Council as the highway authority, has a statutory responsibility to work with the relevant District or Borough Council to develop and deliver the action plans for these AQMA. Highways England has an equivalent responsibility to work with the relevant District and Borough Council in relation to the Strategic Road Network where there are AQMA (i.e. the A27, the M23 and the A23 to the south of Pease Pottage).
4. The Annual Status Report (ASR) report provides an overview of air quality in Mid Sussex. It contains details of monitored pollutants and incorporates information on changes or potential changes to the environment due to new processes or developments. This allows us to identify potential impacts on air quality which we need to consider and mitigate. The report also includes an update on the actions within the AQAP to address air pollution in the district.
5. Mid Sussex District Council's Annual Status Report for 2018 was approved by Defra in August 2019 and is available to view on the MSDC website under Environment/Air-Quality.

6. As air pollutants do not recognise boundaries we work in partnership with our colleagues in the other districts, boroughs and Counties to deliver air quality. The group is Sussex wide and is known as the Sussex Air Quality Partnership, with representatives from Public Health, County Highways, the Environmental Research Group at King's College London and the air quality specialists from the district and boroughs.
7. Generally, in Mid Sussex District we have good air quality, but we do have one hotspot where exceedances of one pollutant has been identified. Such hotspots exist widely in Central London. On account of this, in 2012 we declared an Air Quality Management Area at the Stonepound Crossroads, Hassocks due to levels of nitrogen dioxide (NO₂) exceeding the air quality objective level of 40ug/m³ expressed as an annual mean concentration. Once the declaration had been made, we produced an Action Plan listing a number of measures to improve and reduce the pollutant levels. Early indication is that the air quality is improving. We also have a Members' Air Quality Steering Group supported by the relevant officers from the district and county which meets annually to audit and direct the action plan.
8. The exceedance of the air quality objective level for nitrogen dioxide at the Stonepound Crossroads is assessed at the building façade and relates to the average exposure at that position measured or modelled over the period of a year for those living there. For 4 out of the 5 monitoring sites within the AQMA, NO₂ levels are below the objective and the other monitoring site has marginally exceeded the objective in 2018 having been below it in 2017. The overall trend shows a steady decline in pollution levels and the monitoring data indicates that the objective is likely to be met in the next couple of years. The objective level does not relate to short term exposure for people walking around the area or through it. There is a much higher limit for short term exposure to concentrations of nitrogen dioxide and the levels at Stonepound Crossroads are well below this level.

Brief background to Air Quality Pollutants

9. There are a variety of different pollutants that have impacts on health for which the government has set objective levels to protect health. The main ones of concern are nitrogen dioxide (NO₂) and particulate matter (PM). Particulate matter is often referred to by size, so you may see references to PM₁₀, PM_{2.5} or PM_{0.1} and are a health concern due to their tiny size which can penetrate deep into the lungs.
10. Pollutants:
 - Nitrogen dioxide (NO₂) -Road transport is responsible for some 80% of NO₂ concentrations at the roadside, with diesel vehicles of greatest concern at a local level. This is due in part to improvements in real world emissions testing showing that laboratory test-based emission standards have not delivered expected reductions under real world driving conditions.

- Particulate matter-is a generic term for tiny soot, grit and dust particles caused by combustion processes such as power plants and motor vehicles and also when gases and particles interact with one another in the atmosphere. They are categorised by size and identified in microns (μm). Of the different sizes of particulate matter, $\text{PM}_{2.5}$ has the strongest epidemiological link to health outcomes as this size particle can be inhaled deep into the lungs. The very smallest particles, ultra-fine $\text{PM}_{0.1}$, once inhaled are able to pass directly into the bloodstream. Unlike NO_2 where concentrations are high immediately adjacent to the source, particulate matter has a much wider geographical extent and guidance suggests we can use monitoring from up to 50 miles away as a reference. Due to the large distances that PM can travel, it is harder to control at a local level.
11. National and European objectives define levels based on the known effect these pollutants have on human health. Objectives are set in law and, where an AQMA has been designated, local authorities have a statutory obligation to work towards meeting them.
 12. However, there is no evidence of a safe level of exposure to particulate matter or a threshold below which no adverse health effects occur. So the approach for this pollutant is generally accepted to be a reduction in background concentrations to ensure the best health outcomes for the widest geographic range of people. It is important to note that local authorities are not presently required to monitor $\text{PM}_{2.5}$.
 13. There is consistent evidence demonstrating clear adverse effects of exposure to air pollutants on health, particularly on the very young, very old and those with existing health conditions. Poor air quality is linked with an increased risk of developing chronic conditions (e.g. chronic obstructive pulmonary disease), poor birth outcomes, lung cancer, respiratory disease and others.
 14. The health problems resulting from exposure to air pollution have a high cost to society and business, causing demand on our health services and resulting in illness and even premature death. These vulnerabilities are heightened among those living in the most deprived communities.
 15. The Public Health Outcomes Framework (PHOF) includes an indicator which quantifies the contribution of exposure to particulate matter on mortality. In 2017 the fraction of mortality attributable to anthropogenic $\text{PM}_{2.5}$ was 5.4% for Mid Sussex. This compares to an estimated fraction of 5.1% for England, and a range between 5.8% (Crawley) and 5.0% (Chichester) for other districts in West Sussex. In summary, the air pollution in Mid Sussex is broadly in line with the regional average.
 16. The figures for mortality in the PHOF for particulate matter are estimates of mortality attributable to this risk factor. Outdoor air pollution is a major public health issue costing the UK economy £20bn a year and contributing to over 25,000 deaths a year. It is important to understand that long-term exposure to air pollution is not thought to be the sole cause of deaths. Rather it is considered to be a contributory factor.

Annual Status Report

17. The latest Annual Status Report for air quality monitoring and action in 2018 was submitted in July 2019 and approved by Defra in August. The next report on air quality in the district covering the year 2019 will be submitted in June 2020. The report format is prescribed by Defra and the monitoring data must be presented in the prescribed way.

18. The 2019 report, covering the 2018 monitoring period, states that air quality monitoring and modelling carried out by the Council indicated that despite good air quality within most of the District, the air quality objective for nitrogen dioxide (NO₂), expressed as an annual mean concentration, was not being met in the Stonepound Crossroads area of Hassocks. Therefore, in March 2012 an Air Quality Management Area (AQMA) was declared at Stonepound Crossroads Hassocks and will remain in place until there is evidence that the annual mean concentration meets the statutory objective.
19. It confirms that the main source of air pollution in the district is road traffic emissions. This being the case, Mid Sussex District Council must rely on the Highways Authority at West Sussex County Council to bring forward and implement traffic management and road layout initiatives for air quality improvement.
20. Our monitoring results in 2018 show a decrease in the nitrogen dioxide (NO₂) levels across the district compared to those recorded in 2017. The monitoring data indicates that the long-term trend, despite an increase in 2016, is downwards. This we attribute to the improved technology in the national vehicle fleet. i.e. vehicles with lower emissions and using cleaner fuels. (See appendix 1)
21. In 2018 we undertook non-automatic (passive) monitoring of NO₂ at 26 sites (see appendix 2). The monitoring sites are reviewed annually and in September 2018 at the request of West Sussex County Council we added a short-term monitoring site at the primary school in Balcombe which was funded by WSCC.
22. The Council has been monitoring air quality at sites across the district since 1996. Long term monitoring in specific locations provides continuity of data and enables us to identify air quality trends. Monitoring sites are chosen where there is relevant exposure, i.e. in locations where there are high traffic volumes and houses close to the road, as concentrations of pollutants drop off rapidly with increasing distance from the source.

Air Quality Management Area

23. Within the AQMA at Stonepound Crossroads exceedances of NO₂ are due to the topography, the volume of road traffic at the junction and the proximity of residential properties to the road. Since the AQMA was declared in 2012 there has been an overall reduction in measured NO₂.
24. The monitoring sites around the Stonepound Crossroads have been selected to measure NO₂ levels as close as possible to relevant receptors (in this case residential property facades). Where monitoring sites are not at relevant receptors, a distance correction can be applied to the measured level to give the pollutant concentration at the relevant receptor. Around the Stonepound Crossroads, there is only one of the monitoring locations where the annual average NO₂ concentration, as measured or calculated at a residential receptor, exceeded the objective level in 2018 (40.1µg/m³ compared to the objective level of 40µg/m³). The overall trend for NO₂ has been a steady decline over the years 2011-2018. Appendix 4 displays the NO₂ trend at the monitoring locations at Stonepound Crossroads over the last 7 years.
25. Having declared an AQMA, we are required to draw up an Air Quality Action Plan (AQAP). The purpose of the AQAP is to identify measures designed to reduce the pollutant levels so they fall within the air quality objective level which for NO₂ is 40µg/m³ expressed as an annual mean concentration.

26. Table 1 provides an overview of the actions endorsed by the Steering group to date and the work yet to be completed:

Table 1 – Air quality action plan measures investigated

1	Traffic light sequencing operating at optimum level	Underway
2	Cut Engine, Cut Pollution” signs erected	Completed
3	Linking residents and schools to Air Alert and Cold alert service available-via Sussex-Air which informs residents if there is likely to be poor air quality	Completed
4	District Plan now adopted including policies on Transport and Pollution	Completed
5	Signage to encourage use of the A2300 as alternative route	Completed
6	Development of school travel plans	Completed
7	Working with Planning to ensure maximum mitigation measures implemented for all new developments in the vicinity of the AQMA. Air Quality and Emissions Reduction Planning Guidance for Sussex incorporated into planning policy	Ongoing
8	Car sharing is promoted through the Green Travel Pages on the MSDC intranet.	Completed
9	Better driving techniques promoted	Completed
10	Mid Sussex District Plan includes reference to supporting additional cycle ways and bridleways, including routes to Clayton and Hurstpierpoint	Completed
11	Section 106 funds were allocated from the Sustainable Transport Fund to successfully upgrade slow electric vehicle chargers to fast chargers in MSDC car parks.	Completed
12	Commencement of improvements to new cycling and walking routes from Hassocks Station to the South Downs Way via Lodge Lane.	Due to start next year
13	The County Council continues to work with Sustrans to consider a prioritisation approach to the delivery of cycle route infrastructure across the county	Ongoing
14	New strategy for EV charging to be identified in liaison with Planning Officers, Wellbeing and other council officers.	Ongoing

15	Widening and improvements to the A2300 road.	Due to be delivered over the next 5 years.
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Mid Sussex District Council's priorities to promote good air quality in the coming year

27. The adoption of the District Plan has enabled us to embed policies on transportation and pollution. This will enable us to effectively use the planning regime to ensure appropriate mitigation measures are incorporated into development schemes, especially close to the AQMA. The National Planning Policy Framework has, as its overriding aim, the presumption in favour of sustainable development. So, whilst air quality is a material planning consideration when determining applications, there needs to be clear evidence that a development will either create a new air quality management area, conflict with the air quality action plan of an existing AQMA or have a significant adverse impact on existing air quality for an application to be refused on air quality grounds.
28. Sustainable transport across all sectors, business, schools, home owners etc, with improved cycle routes and infrastructure to encourage people out of their cars results in air quality improvement. Sussex Air Quality Partnership has had a successful bid for Defra funding for an anti-idling project to be run throughout Sussex, targeting schools and businesses close to pollution hotspots, including two schools in Hassocks. Parking strategies can also be a valuable tool in incentivising low emission vehicles.
29. Working with our colleagues across the County to deliver a joined-up approach to improving Air quality in County. In October 2018 West Sussex County Council and the District and Boroughs came together to form a Member led Inter-Authority Air Quality Group with an aim to develop and agree an annual action plan and monitor progress and impacts of air quality actions across the County.

Future considerations for air quality management

30. The Environment Bill 2019-2020 was announced in the Queen's speech on 14 October 2019 with implications for the legal framework of environmental stewardship for the UK. It will address the environmental governance gaps following withdrawal from the EU and sets a series of environmental principles. There will be a new Office for Environmental Protection (OEP) which will become an independent watchdog monitoring progress in improving the natural environment. The OEP will hold public authorities to account in the way the European Commission monitored member states.
31. The Bill makes a clear commitment to improve air quality by setting legally binding targets for fine particulate matter (PM_{2.5}), the most damaging pollutant to human health.
32. The Government produced a Clean Air Strategy in 2019 to tackle all sources of air pollution with the aim of making the air healthier to breathe, protecting nature and boosting the economy. Amongst other things it commits to reducing exposure to PM_{2.5}, providing a personal air quality messaging system to alert vulnerable people of forecasted pollution episodes (in a similar way to that currently provided locally by Sussex Air called "Air Alert"), tackling smoke emissions from wood burning in the home and reducing emissions from all types of transport.

33. The Clean Air Strategy acknowledges that 2 tier local government has been a barrier in bringing about prompt air quality improvement. The issue is that District and Boroughs have the responsibility to monitor, assess and report on air quality in their areas while the mechanisms to bring about significant air quality improvement rests with County authorities which, being the highways authority, have the power to implement highway improvements and improve highway infrastructure. The strategy suggests some options to address this regulatory misalignment.
34. The Department for Transport published a transport strategy in July 2018 called Road to Zero with the ambitious aim of all new cars and vans being zero emissions by 2040. There will be increases to the supply of low carbon fuels, an extension to the accreditation scheme for retrofitting vans and cabs to cleaner options, offering grants for the transition to plug-in cars, as well as measures to tackle emissions from HGVs and investing in eV infrastructure.

Policy Context

35. Since 1995 local authorities are required to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives set by the Government are likely to be achieved. Where exceedances are considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP), setting out the measures it intends to put in place in pursuit of achieving the objectives.

Financial Implications

36. Costs related to monitoring of air quality from laboratory analysis of diffusion tubes and officer time in installing and collecting the tubes are covered in the environmental health budget.

Risk Implications

37. We are legally required to produce an Annual Status Report on the air quality in the district. Failure to do so would see a formal challenge from Defra and/or our residents.

Equality and Customer Service implications

38. Air quality affects all our residents and our monitoring reflects the entire district. In recent years, air quality has increased in profile amongst the public and in the media and this has led to the Environmental Protection Team dealing with more enquiries and service requests.

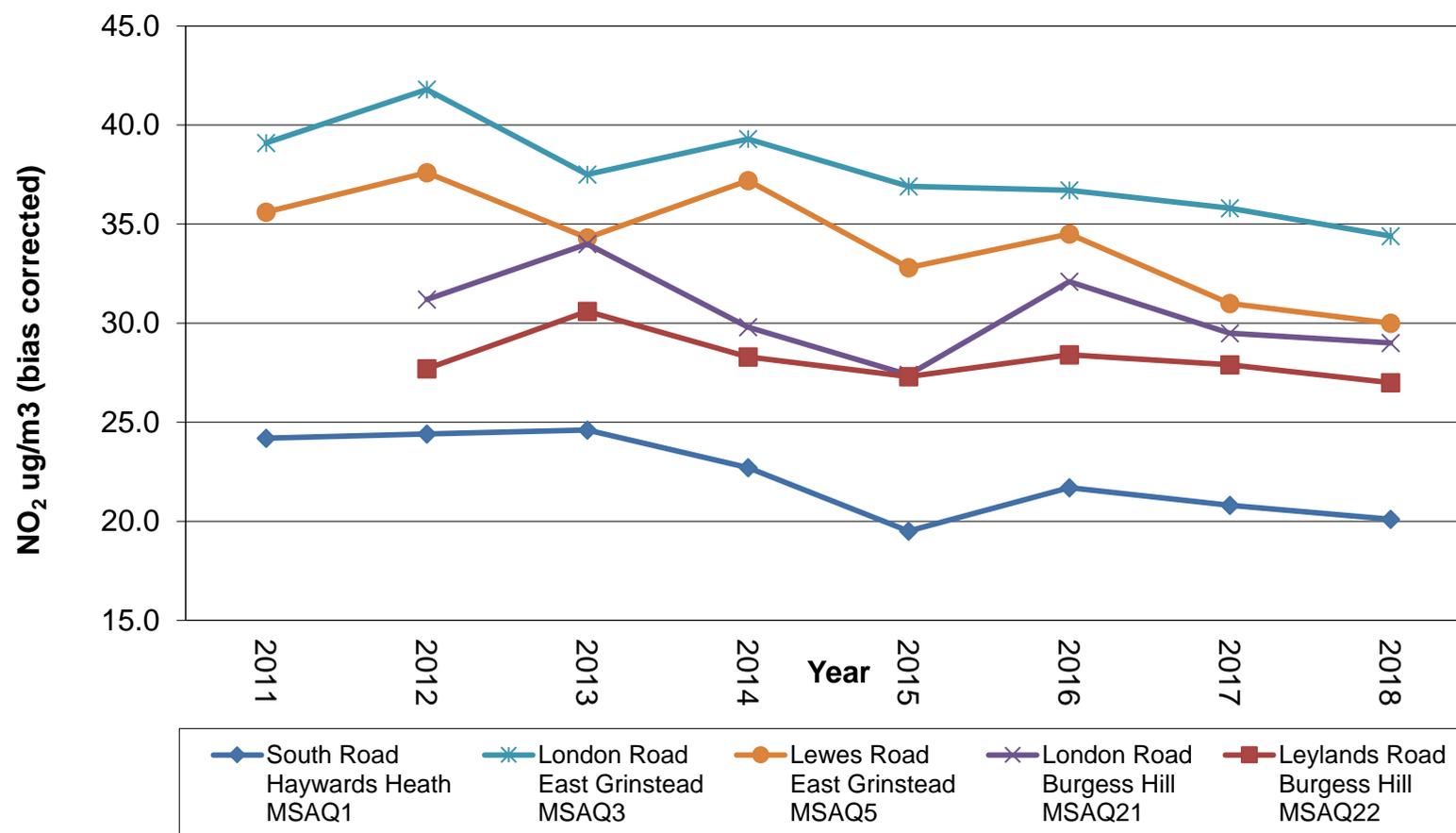
Background Papers

39. Annual Status Report July 2019 Found on MSDC website at
<https://www.midsussex.gov.uk/media/4551/2019-air-quality-annual-statement-status-report.pdf>

Clean Air Strategy 2019, Department for the Environment, Food and Rural Affairs, 2019
found at
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

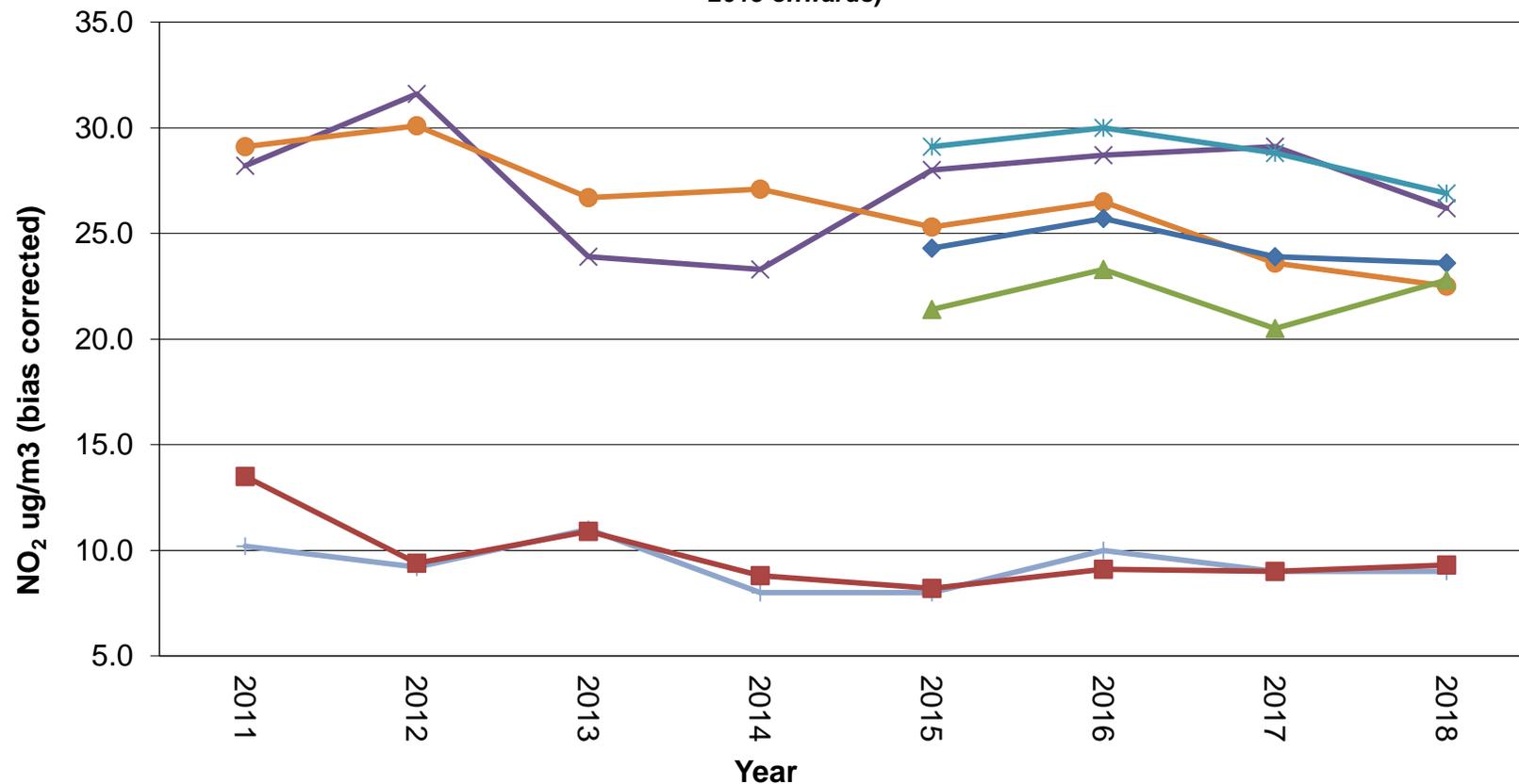
Road to Zero Strategy – Next steps towards cleaner road transport and delivering our Industrial Strategy, Department for Transport, July 2018 found at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/739460/road-to-zero.pdf

Nitrogen Dioxide Monitoring Trends at 5 Urban Centres 2011 - 2018



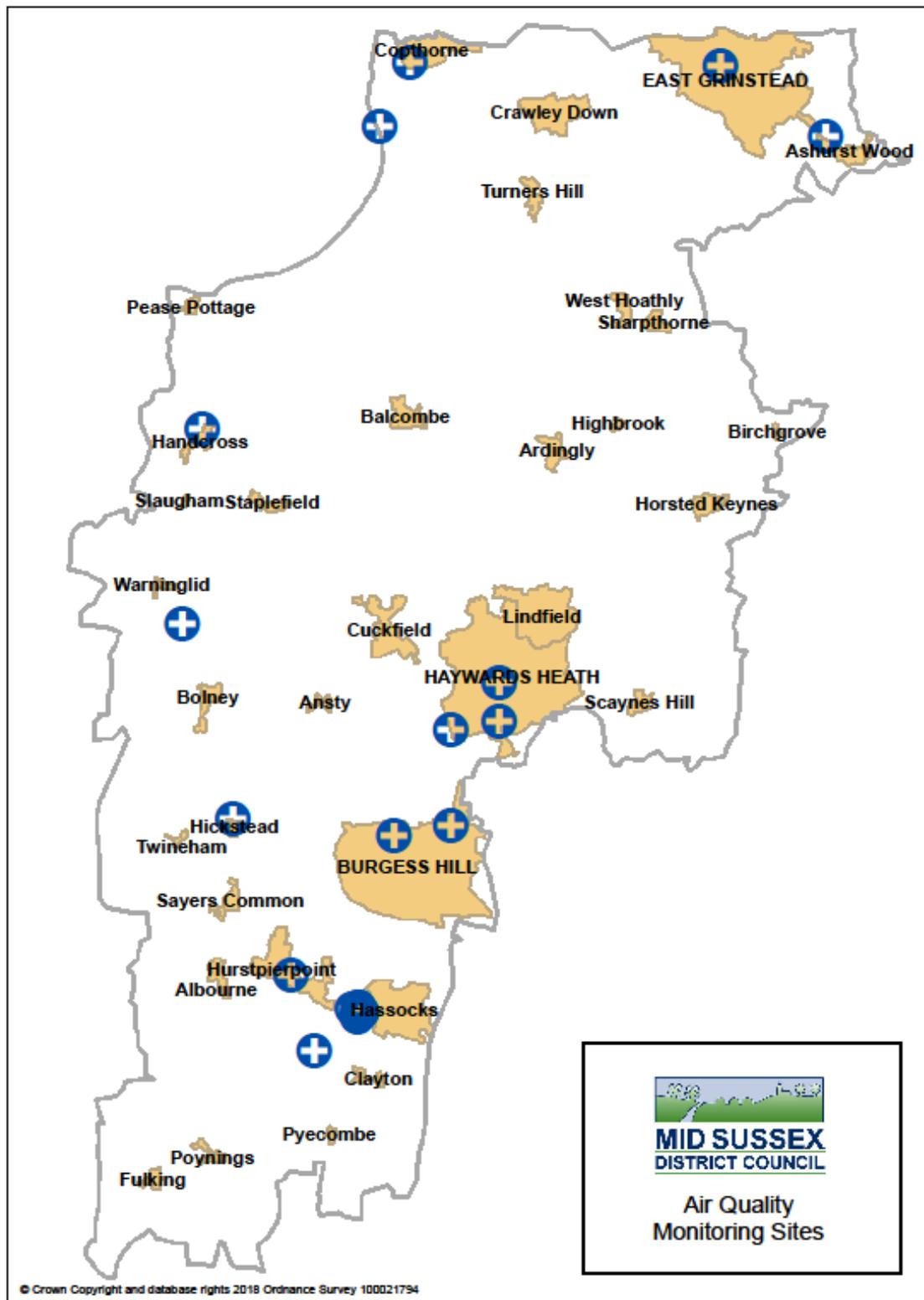
Nitrogen Dioxide Monitoring Trends at 4 Villages 1 Hamlet and 2 Rural Background Sites 2011 - 2018

(Please note that 3 additional monitoring points were added in 2015, hence the additional data points from 2015 onwards)



Smugglers End Handcross MSAQ6
 Crabbett Park (Hamlet) MSAQ7
 Warringlid (rural background) MSAQ9
 Hurstpierpoint (rural background) MSAQ20
 Copthorne MSAQ25
 High Street Hurstpierpoint MSAQ26
 London Road Hickstead MSAQ27

Map of Monitoring Locations across Mid Sussex District



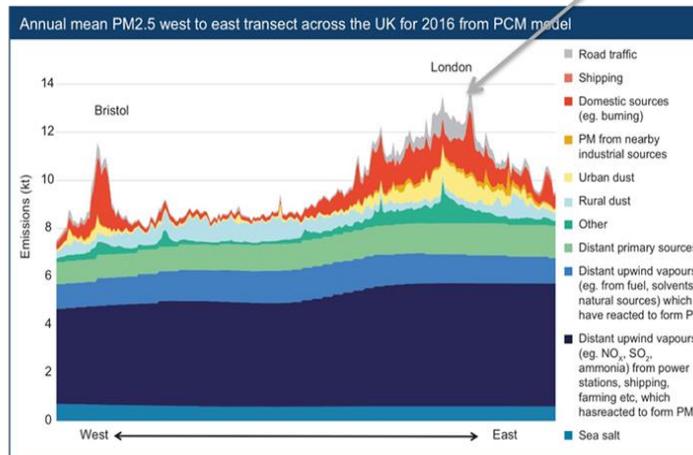
Particulate Matter – PM_{2.5}

Strategies for reducing PM_{2.5}

Domestic sources

– Well publicized issues of domestic burning, fuel and stove regulation?

Road traffic – some future reductions are likely, but PM is still emitted from Electric Vehicles. (Future AQG report)



Urban Dust – Very hard to control since it is agitated by even clean vehicles.

Distant primary – PM_{2.5} is long-lived and brought in to the UK from other countries, including North America

Sea salt – maritime aerosol when combined with other biogenic PM_{2.5} ~ 1-2 mg / m³. e.g ~20% of PM_{2.5} WHO limit is taken up by natural particles.

Upwind Vapours (inorganic)
Planned reductions in NO_x and SO₂ will help. Controls are proposed on farming ammonia, but PM_{2.5} formation is highly non-linear. Small NH₃ reductions have little effect on PM_{2.5}

Upwind Vapours (organic)
Volatile Organic Compounds are precursors to both ozone and PM_{2.5}. UK needs to halve emissions by 2030. CAS focuses on domestic sources.



Nitrogen Dioxide Monitoring Trends in AQMA Hassocks 2011 - 2018

