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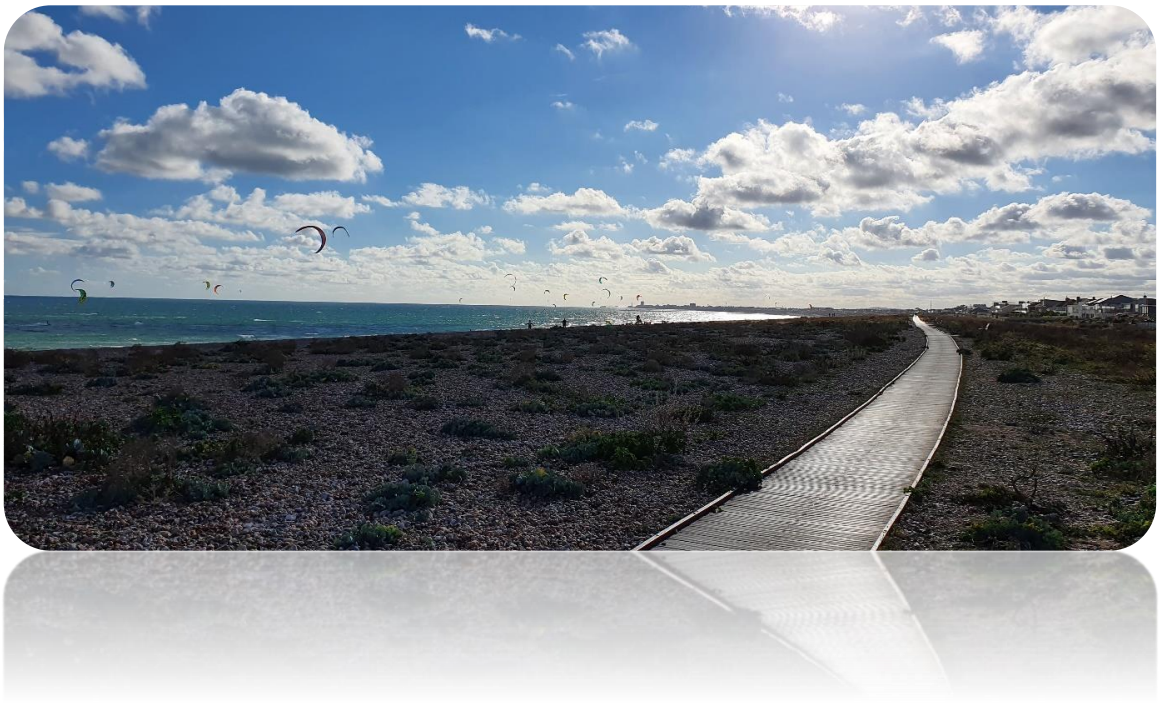

2020 Air Quality
Annual Status Report (ASR)

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

September 2020

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Executive Summary: Air Quality in Our Area

Air Quality in Adur

This report covers monitoring and action taken during 2019.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

There currently remain two Air Quality Management Areas (AQMA's) within the District: AQMA 1 – High Street, Shoreham-by-Sea; and AQMA 2 – Old Shoreham Road, Southwick. Both were declared for exceedances of the Nitrogen Dioxide annual mean objective. Levels in and around both AQMA's reduced during 2019 and remain below the annual mean objective.

Adur District Council undertook automatic (continuous) monitoring at one site during 2019, in Shoreham High Street (A259). The annual mean measured for 2019 was 26µg/m^3. This is comfortably below the objective of 40µg/m^3. There were no recorded exceedances of the one hour mean objective of 200µg/m.

Non-automatic (passive diffusion tube) monitoring of NO_2 also took place at 24 sites using 26 tubes. Three sites were removed and three added as previous results had shown levels well below the annual mean objective.

Measured levels have steadily fallen over recent years and this trend continued with all monitoring sites recording a fall in 2019.

No monitoring sites exceeded the annual mean objective of 40µg/m^3 during 2019.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

The highest level recorded in the District was 38.4µg/m^3 at a new site S44 Upper Brighton Road, Lancing. This monitoring site is located adjacent to the westbound A27 dual carriageway. The closest receptor is over 5m away and when predicted back to the façade the level reduces to 30.9µg/m^3, below the annual mean objective of 40µg/m^3.

Adur District Council will keep the measured levels in AQMA 1 under review, especially with more reliable and accurate automatic monitoring data being collected. There remains a number of major developments planned for the Adur District, particularly in and around the AQMA, which have yet to be completed. Therefore we do not consider it pertinent to revoke the AQMA at this time.

Measurements of NO_2 in AQMA 2 have again fallen to below the annual mean objective. In previous ASR's we advised that we would revoke AQMA 2 in Southwick and this remains our intention.

Measurements of Particulate Matter PM_{10} were measured to be below the annual mean objective of 40µg/m^3, at 24.3µg/m^3. There were 8 recorded exceedances of an hourly mean of 50µg/m^3; the national objectives state that up to 35 exceedances are permitted. An estimate of Particulate Matter $PM_{2.5}$ levels were made from our PM_{10} measurement. This suggested $PM_{2.5}$ concentrations of 17µg/m^3. This is within the permitted level of 25µg/m^3 (but above WHO recommendations).

We have yet to complete our new Action Plan. We have completed air quality modelling of NO_2 levels in and around AQMA 1, which alongside our completed source apportionment study will better inform a revised action plan. We have a good working relationship with West Sussex County Council (WSCC), the Highway Authority and will continue to work with them to improve air quality in the Adur District. However as WSCC are the Highway Authority, they are better placed to reduce the impacts on air quality caused by transport within the District.

More information is available on our website at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/local-air-quality-management/#page-content

Actions to Improve Air Quality

Adur District Council took forward a number of measures during 2019 in pursuit of improved air quality. These included commencing delivery of the Sussex-air Defra funded 'Clean Burn Sussex' project, to raise awareness of the health and environmental impact of burning solid fuels and reduce emissions of particulates; completed delivery of the Sussex-air Defra funded schools intervention programme; continued use of the Sussex Air Quality Emissions Mitigation Planning Guidance and contributed as part of the project team revising and updating the Guidance; West Sussex County Council published their new Parking Standards which included for the first time a target for the provision of active and passive electric vehicle charging points; Adur District (and Worthing Borough) Council declared a climate emergency and committed to reduce carbon emissions associated with council services to zero by 2030; published a Staff Travel Action Plan in association with Sustrans; developed & launched 'easitAdur & Worthing' to council staff and local businesses; produced a Draft Local Cycling & Walking Infrastructure Plan (LCWIP); commissioned a Green Fleet Review from the Energy Saving Trust (DfT funded); approved the purchase of the first council electric vehicles; and erected new anti-idling signs at level crossings and traffic hotspots in the District.

Conclusions and Priorities

Measured concentrations of NO_2 fell at all monitoring sites and were below the annual mean objective. Levels measured within AQMA 1 in Shoreham High Street decreased again whilst concentrations within AQMA 2 in Southwick also decreased again. As a result we will seek to revoke AQMA 2 next year.

Priority actions for 2020 include:

an updated and revised Adur Air Quality Action Plan, to be developed in partnership with West Sussex County Council; conclusion of the Defra grant-funded Clean Burn project through Sussex-air; consider revocation of the Southwick AQMA 2; publication of the final Local Cycling and Walking Infrastructure Plan (LCWIP); seek to further embed the Sussex Air Quality Planning Guidance within the planning regime; completion of the Highways England funded rapid charger at Lancing Manor; continue to work on establishing an Adur & Worthing Car Club; erect additional anti-

idling signs at traffic hotpots as and where deemed appropriate, commence work on a further revision of the Sussex Air Quality Planning Guidance.

As mentioned in last year's ASR, there remain a number of large scale developments planned for the Adur District and balancing the demand for development with the need to improve (or at least not worsen) air quality will bring challenges. These developments also bring opportunities to improve infrastructure, especially for walking and cycling, and thus seek to limit the impacts on the existing AQMA's, in particular Shoreham High Street. Planned developments are discussed in Section 2.

Local Engagement and How to get Involved

We engage with interested parties in the District, including community groups, elected members, transport planners, planning policy and development control. We are active members of the Sussex Air Quality Partnership (Sussex-air). The Partnership provides assistance to members and information to the public via their website with air quality data, news updates, educational resources, links and other services such as air Alert. See http://www.sussex-air.net/ for more information.

With development pressures across the Adur District, it is important that interested parties try to work together to achieve favourable outcomes.

The Council is always interested in hearing from residents who may have innovative ideas to reduce traffic congestion/air pollution in and around the District. You may contact us using our online form at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/local-air-quality-management/#have-your-say.

Road vehicles produce over 50 per cent of the emissions of nitrogen oxides in the UK.

Before using your car, ask yourself:

- could I walk or cycle instead of taking the car?
- could I take a bus or train?
- are the levels of air pollution high today? (See our website for forecasts: https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/air-quality-monitoring/#airalert)

- Using quieter streets when you're on a bike or on foot can lower your exposure to air pollution by up to 20%.

If you must drive:

- drive smoothly and don't rev your engine unnecessarily. You'll save fuel, and your engine will also pollute less;
- maintain your car. Keep the engine properly tuned and the tyres at the right pressure; and
- turn off your engine when your car is stationary for prolonged periods, particularly at main junctions and level crossings. By not idling your engine you'll help to make the air cleaner for you, other drivers, pedestrians and cyclists.

At home:

- Buy water-based or low-solvent paints, varnishes, glues and wood preservatives.
- Half of all deliveries to workplaces are personal parcels for staff. By using pick-up points in corner shops or lockers in train stations you can help to reduce pollution from delivery vehicles.
- Open fires and wood-burning stoves have risen in popularity over recent years. This means we now see more smoke from chimneys, which has a negative effect on air quality. This can result in elevated particulate emissions and cause breathing problems, asthma attacks and contribute to other health conditions. Fuels such as wood and coal are permitted as long as the smoke from their combustion does not cause a statutory nuisance to neighbouring properties. However the use of inappropriate fuel can cause problems with local air quality.
  The leaflet at the link below provides information and advicefor those that use wood burning stoves or open fires, to reduce environmental and health impacts. By following its advice you can help to minimise the effect of your burning: https://www.adur-worthing.gov.uk/media/media,149513,en.pdf

- Try to avoid lighting bonfires. If you must have a bonfire only burn dry material and never burn household waste, particularly plastic, rubber, foam or paint. Levels of pollution can be quite high on bonfire night and other events/festivals with bonfires, and sensitive people, including people with respiratory conditions, may notice some effects. However exposure can be considerably reduced by remaining indoors and keeping windows closed. Further information is available on our website at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/bonfires-and-smoke/.

Information on Air Quality, including reports and monitoring results, is available on our website at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/. Information is also available at http://www.sussex-air.net/.

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1 Local Air Quality Management

This report provides an overview of air quality in Adur during 2019. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Adur District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Adur District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/local-air-quality-management/#local-aqma. There is also a full list of nationally declared AQMA's at https://uk-air.defra.gov.uk/aqma/list.

Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

We will consider revoking AQMA2 – Southwick during 2020.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan		
						At Declaration	Now	Name	Date of Publication	Link
Adur District Council AQMA 1	2005	NO_2 Annual Mean	High Street Shoreham-by-Sea	An area encompassing the A259 High Street, Shoreham-by-Sea between the Ropetackle Roundabout and Surry Street.	NO	42 µg/m^3	29.4 µg/m^3 [4]	Adur Air Quality Action Plan 2007	2007	https://www.adur-worthing.gov.uk/media/media,104971,en.pdf
Adur District Council AQMA 2	2005	NO_2 Annual Mean	Old Shoreham Road Southwick	An area encompassing the A270 Old Shoreham Road, Southwick between Kinston Lane and Lower Drive	NO	46 µg/m^3	29.4 µg/m^3 [5]	Adur Air Quality Action Plan 2007	2007	https://www.adur-worthing.gov.uk/media/media,104971,en.pdf

☒ **Adur District Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

[4] Façade level measured directly from tube S42
[5] Façade level calculated from tube S9

2.2 Progress and Impact of Measures to address Air Quality in Adur District

Defra's appraisal of last year's ASR stated that the conclusions reached are acceptable for all sources and pollutants.

The following comments were made which have been noted and where necessary actioned.

1. *Trends are clearly presented and discussed and a robust comparison with air quality objectives is provided.*
2. *The diffusion tube mapping is comprehensive and clearly demonstrates the monitoring network. AQMA boundaries could be shown more clearly.*
3. *The decision to revoke the Southwick AQMA is supported. Concentrations have been below the air quality objective for a number of years.*
4. *It is supported to keep the Shoreham AQMA under review until a full year of data is collected from the new continuous monitor. It is noted the Council have also increased diffusion tube monitoring on Shoreham High Street and at Humphries Gap. This will help monitor concentrations in the AQMA as major development work takes place in the area and can aid the decision to either support or revoke the AQMA in the coming years.*
5. *Adoption of a revised AQAP should be a priority for the next reporting year. It is understood progress has been made and a draft is anticipated being available for consultation in 2019.*
6. *The report includes links to Public Health Outcomes Frameworks and the Council is working to reduce $PM_{2.5}$ concentrations across the district.*
7. *Distance correction was carried out for every site, calculations were only provided for 6 sites. The guidance was updated in April 2018 to state that distance correction is not necessary for sites below 36ug/m^3. See LAQM TG16 paragraph 7.78 for further details.* This has been noted for this year.
8. *In the excel document, Table A.3 the pre bias-adjusted value was entered for S42. Same is the case for AD1 in Table A.5. This should be corrected before publication.* Noted.
9. *Comments from the previous appraisal are provided and have been addressed.*
10. *The report is a good resource for members of the public wanting to know how they can get involved to improve air quality in their district.*

Adur District Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Key completed measures are:

1. Commenced delivery of the Sussex-air Defra funded 'Clean Burn Sussex' project. This was designed to raise awareness of the health and environmental impact of burning solid fuels such as wood and coal and encourage people to choose cleaner, more efficient fuels and ultimately reduce emissions of particulates, particularly $PM_{2.5}$. We assisted in the production of new webpages on the Sussex-air website to raise awareness - http://www.sussex-air.net/Cleanburn/clean-burning.aspx. We also promoted a clean burn survey to gather information on wood burning in Adur & Worthing – including information on the type of appliances used, the types of fuel used and whether these were used as primary sources of heating or simply recreational use. The results will be reported in the 2021 ASR.
2. Completed delivery of the Sussex-air Defra funded schools intervention programme. The project employed Sustrans to deliver a six week programme in primary schools. The project aimed to raise awareness of air quality issues with small groups of pupils who then presented their findings to the wider school community. A Sustrans Air Quality officer engaged with new schools and those already working with Sustrans to investigate local air quality. Living Streets ran one day anti-idling events outside the schools to tie in with the Sustrans work. At the time of writing Adur primary schools participating were Swiss Gardens and St Nicholas & St Mary's in Shoreham and Eastbrook in Southwick.

   The local business aspect of the project was not completed as a result of a lack of businesses engaging with the project. As a result the funding intended for this part of the project was diverted to the schools engagement part of the project.
3. We continued to use the Sussex Air Quality Emissions Mitigation Planning Guidance as part of the planning process. All 'major' planning applications are required to follow the guidance and produce an Emissions Mitigation

Assessment, looking at transport emissions from a proposed development and determining the level (cost) of mitigation required to help reduce (offset) the potential effect on health and/or the local environment. The approach is quite novel and Sussex authorities are attempting to push for this approach as the norm. We have negotiated with developers to ensure appropriate mitigation is provided. The guidance is signposted within the Adur Local Plan. We also continued to work with planning colleagues at both District and County level to ensure air quality is highlighted during pre-application discussions with developers, with the aim of incorporating appropriate mitigation into the design of schemes.

4. Contributed as part of the project team to a revision of the Sussex Air Quality & Emissions Mitigation Guidance for Planning. Publication of the revised document, which had a greater emphasis on the provision of appropriate mitigation, was delayed until early 2020.
5. West Sussex County Council published their new Parking Standards - https://www.westsussex.gov.uk/media/1847/guidance_parking_res_dev.pdf. This includes a target for the provision of active and passive electric vehicle charging points in parking spaces with the percentage allocated to ev's increasing year on year.
6. Adur District (and Worthing Borough) Council declared a climate emergency and committed to reduce carbon emissions associated with council services to zero by 2030.
7. Publication of a Staff Travel Action Plan, working in association with Sustrans, and set up a Travel Action Plan working group to assist in delivering the Plan (e.g. improved bike secure parking and cycling facilities, e.g. at Commerce Way, provide Donkey Bikes for staff business travel, have a Cycle Day to promote cycling, promote walking to staff through Well@work).
8. Established a new cycle to work scheme for staff (with SODEXO) to make environmentally travel easier for staff.
9. Developed & launched 'easit Adur & Worthing' to council staff and businesses in March 2019. 17 organisations signed up representing. Businesses signed up to date:

- AIG Europe Ltd
- Adur & Worthing Councils
- Colonnade House
- Emerald Finance Ltd
- Equiniti Group
- Greater Brighton Metropolitan College
- GSK
- Higgidy Limited
- Infinity Foods Co-operative Ltd
- Mosaic Online Systems
- Paper Round South East
- Pier 2 Pier Care Services Limited
- Pitch Publishing Limited
- Sussex Partnership NHS Foundation Trust
- The Proto Restaurant Group
- West Sussex County Council
- Western Sussex Hospitals NHS Foundation Trust (Worthing and Southlands Hospitals)

10. Produced a Draft Local Cycling & Walking Infrastructure Plan (LCWIP). Sustrans were contracted to deliver this, working with the Council, West Sussex County Council and a stakeholder group 'A&W Walking and Cycling Action Group'. The draft was approved for consultation in November 2019.
11. Commissioned a Green Fleet Review from the Energy Saving Trust (DfT funded)
12. Approved the purchase of the first council electric vehicles (3 electric vans for environmental services)
13. Delivering new salary sacrifice schemes for bicycles (SODEXO) and low emission vehicles (Tusker). This aims to make environmentally travel easier for staff.
14. An Active Travel Day was held to promote active and low carbon travel. Plans were made to decarbonise business travel through switching the current pool car fleet to hybrid vehicles and increase cycling provision at council sites.

15. Two documents were developed from consultancies Energy Saving Trust and CLS - with no charge to the council - to review the business travel from civic buildings, and switching the corporate fleet to ultra-low emission vehicles.
16. At the time of writing there was still no decision or update from Highways England following their 2017 public consultation on a “proposal to improve the A27 junctions at Worthing and Lancing.”
17. The Highways England funded rapid charger at Lancing Manor was not delivered in 2019, due to issues with the provider. It was due in 2020.
18. An Adur & Worthing Car Club is awaited. Work had been ongoing with a delivery partner, but progress had been slow.
19. New anti-idling signs were erected at level crossings in Shoreham. These were funded by Sussex-air and produced by WSCC. Adur District Council erected smaller anti-idling signs at particular traffic hotspots across Adur in a bid to try and persuade vehicle drivers to switch off whilst waiting in queuing traffic.
20. Completed an updated air quality modelling report for Shoreham High Street. This will help inform the revised Adur Air Quality Action Plan.

Adur District Council expects the following measures to be completed over the course of the next reporting year:

- Publish a revised Adur Air Quality Action Plan – this remains overdue and is a key priority, drafted in partnership with West Sussex County Council.
- Consider revocation of the Southwick AQMA.
- Publish the final Local Cycling and Walking Infrastructure Plan (LCWIP).
- Completion of the Sussex-air Defra grant funded ‘Clean Burn’ project in Adur.
- Further embed the Sussex Air Quality Planning Guidance within the planning regime in Adur.
- Completion and operation of the Highways England funded rapid charger at Lancing Manor, assisting the take-up of ULEV’s.
- Provision of an Adur & Worthing Car Club, to reduce single car ownership and facilitate new developments with reduced parking;

- Erect additional anti-idling signs at traffic hotpots as and where deemed appropriate, to try and persuade vehicle drivers to switch off whilst waiting;
- Commence work on a further revision of the Sussex Air Quality Planning Guidance.

The principal challenges and barriers to implementation that Adur District Council anticipates facing are

- There remain development pressures in the Adur District. A large number of major developments have been granted permission and there remains a large number planned for the District. Balancing the demand for development with the need to improve (and not worsen) air quality brings challenges. These developments also bring opportunities to improve infrastructure, especially for walking and cycling, and thus limit the impacts on the existing AQMA's and avoid creating new hotspots.

  The Adur Local Plan 2017 allocated the following sites:

  - West Sompting – allocated in the Adur Local Plan for a minimum of 480 homes and a range of open space. Application AWDM/0323/19 seeks permission for 520 dwellings.
  - New Monks Farm. The Adur Local Plan 2017 allocated this site for a maximum of 600 dwellings, Country Park, extension and relocation of traveller's site, new access onto A27 and a primary school. The site lies adjacent to the A27. Subsequent to the adoption of the plan, an application for full permission for 249 dwellings, outline for a further 351 dwellings and a non-food retail store (A1) (instead of the employment generating floor space) and other uses referred to above has been granted permission. See planning ref.AWDM/0961/17.
  - The New Monks Farm application is linked to planning ref. AWDM/1093/17 at Shoreham Airport due to a shared access to the A27. This site was allocated in the Adur Local Plan 2017 for 15,000 square metres of employment generating floorspace. Subsequent to this application planning ref. AWDM/1093/17 was granted consent for 25,000sqm of business floorspace.

- The Adur Local Plan 2017 allocated the Shoreham Harbour Regeneration Area for a minimum of 1100 dwellings. Subsequently the Shoreham Harbour Joint Area Action Plan was adopted in 2019. Developments within this area include the following:
  - Free Wharf, planning permission granted for residential development (see planning ref. AWDM/1497/17) including 540 dwellings, and 2,707sqm of commercial floorspace including A1 retail, A3 cafes and restaurants, B1 and D1. The development will also provide 596 cycle parking spaces, open space, and provision of a pedestrian and cycle riverside route.
  - Kingston Wharf, Shoreham-by-Sea (ref. AWDM/0204/20) - permission granted subject to signing of legal agreement, for mixed use development of 255 residential dwellings, mixed-use business centre and cafe. Includes cycle parking.
  - Albion Street, Southwick (ref.AWDM/0954/18) - a residential scheme with a net gain of 38 dwellings.

- Providing sufficient resources (financial and personnel) in order to progress and deliver effective air quality measures.
- Identifying suitable sites for the provision of car club spaces alongside sufficient funding, particularly away from new developments.
- Identifying suitable sites for the installation of electric vehicle charge points remains an issue. Working in partnership with WSCC is vital at certain locations. Identifying sufficient funding is often an issue and sound business cases must be put forward before any commitments are made by elected Members;
- The provision of additional low emission vehicles into the Council's pool car fleet will depend on funding and suitable vehicles being available. At present electric vehicles are not part of the fleet due to the lack of ev charge points at Council sites.

Progress on the following measures has been slower than expected due to:

- We stated in our previous report that producing a revised air quality action plan was a priority, however this was delayed. Updated modelling in early

2020 alongside the source apportionment study already completed will assist and we hope to make further progress during 2020/21.

- WSCC led improvement schemes for Norfolk Bridge and High Street Shoreham were further delayed as a result of funding and priorities.
- The provision of a local car club has been delayed, primarily due to the permitted local developments funding these having yet to be commenced.
- The provision of additional low emission vehicles into the Council's pool car fleet was delayed due to the lack of EV charge points at Council sites. We are seeking to address this in 2020.

Adur District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA1 Shoreham High Street.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Adur/Worthing Car Club	Alternatives to private vehicle use	Car Clubs	2014-19	Adur DC/Worthing BC.	Funding: Developer contributions/Adur DC	Number of people using the service/Number of vehicles available	1%	Discussions with WSCC and car club providers continued during 2019, looking at both on street and off street spaces. Pool car providers continued discussions with developers in Shoreham.	2019/20	Principle of car clubs embedded in new developments planned.
2	LEZ/CAZ Feasibility	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2018/19	Adur DC	Unknown	Reduction in older Euro class HGV's/LGV's and buses within the AQMA	10-20%	No further discussions	TBC	No CAZ planned. Acceptability, feasibility and enforcement questioned. For these reasons this is not seen as a priority at this stage. Any feasibility study would need to understand the benefits, costs, deliverability, enforceability, level of support and any unintended consequences.
3	Embed AQ Emissions Mitigation Planning Guidance for Sussex into the planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2012	Adur DC/Worthing BC.	Adur DC	LE mitigation secured in developments	1-5%	Revised Guidance due for publication January 2020. The guidance is signposted within the Adur Local Plan. Guidance and appropriate mitigation is flagged as a requirement at an early stage. Emission mitigation assessments required from major developments to ensure meaningful mitigation. Shoreham Harbour JAAP includes policies for sustainable travel and infrastructure improvements.	Ongoing	ADC still to consider developing the Guidance into a Supplementary Planning Document.

4	Improve emissions from the Council's vehicle fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2014/15	Adur DC/Worthing BC/WSCC Funding: LA/WSCC	2015	No. of vehicles replaced with better Euro standard models	<1%	Programme of fleet replacement with low emission/ev/hybrid vehicles as and when they are due for replacement. All pool cars now hybrids.	Ongoing	Council to demonstrate leadership. Anticipated low reduction within AQMA
5	Reduce AQ impact of ADC/WSCC staff travel	Promoting Travel Alternatives	Encourage / Facilitate home-working	2012/13	Adur DC/Worthing BC/WSCC	Adur DC/WSCC	Staff travel surveys reduced commuting and business travel by car	<1%	Adur & Worthing EASIT scheme for staff and local businesses continues. WSCC EASIT scheme already exists. Staff car allowances under review, further hybrids added to pool car fleet.	Ongoing	Focus on reducing staff car journeys for work and promoting sustainable travel for trips to and from work including alternatives to car travel.
6	HGV/LGV assessment	Vehicle Fleet Efficiency	Other	2018/19	Adur DC	Adur DC	Data on Euro Classes	<5%	Defra AQ grant project via Sussex-air for business fleet advice was unsuccessful. Uptake by businesses in Sussex was v poor, so project was shelved. Source Apportionment study shows LGV's contribute more than HGV's	2020	Resource issues remain; LGV's would be prioritised over HGV's.
7	eV charging infrastructure	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016/17	Adur DC/Worthing BC/WSCC	Adur DC/Worthing BC/WSCC/ Developer contributions	Number of charge points provided	1-5%	eV charge points continue to be negotiated for new 'major' developments; new WSCC parking strategy sets minimum targets for ev charge points on new developments; Highways England funded rapid charge point being developed at Lancing Manor. WSCC Electric Vehicle Strategy published Dec 2019: https://www.westsussex.gov.uk/roads-and-travel/travel-and-public-transport/travelwise-sustainable-	2020 on	Focus is to increase the number of eV's.

									transport/electric-vehicles/		
8	Bus fleet improvements	Transport Planning and Infrastructure	Bus route improvements	2009	Adur DC/WSCC	WSCC or OLEV grants	Journey time and passenger number improvements	1-5%	No new progress to report. Bus operators continue to consider low emission fuel technologies in their fleets and WSCC are in dialogue with operators as plans develop, including consideration of any future funding opportunities	Ongoing	Improvement in journey times points towards improved traffic flow. Retrofitting or fleet replacement targeted next and should bring reductions in emissions; small in AQMA
9	Traffic light/pelican crossing optimisation /MOVA traffic control	Traffic Management	UTC, Congestion management, traffic reduction	2007/09	WSCC	WSCC	Improvement in traffic flows	5-10%	Signals continue to be optimised as far as reasonably practicable.	Ongoing	Improved flow/decrease in stop start driving will have a significant beneficial impact on emissions.
10	Travel Plans secured through the planning process for all significant development sites in West Sussex	Promoting Travel Alternatives	Other	Process established	WSCC/Adur DC	Developer contributions	Number of plans delivered	1-5%	Plans continue to be secured as and when developments come forward. The Adur Local Plan adds weight to the requirement for travel plans; Shoreham Harbour JAAP was adopted October 2019 and includes policies for sustainable travel and infrastucture improvements.	Ongoing	Focus on increasing public transport, walking and cycling trips whilst minimising private car journeys. Discussions must include emissions mitigation considerations, can be protracted.
11	Promotion of walking and cycling	Promoting Travel Alternatives	Personalised Travel Planning	2014/15	WSCC/Adur DC	Adur DC/WSCC/ developer contributions	Automatic cycle counters and travel surveys	1-5%	The Draft Adur and Worthing Local Cycling and Walking Infrastructure Plan (LCWIP) was published for consultation in Nov 2019. The Walk To project continued. The Sussex-air schools project promoted walking and cycling working with local primary schools and led to increases of up to 60% in active travel..	Ongoing	Focus on reducing traffic congestion and promoting sustainable travel for trips to and from work (see also item 12). Living Streets Outreach worker funding to 2019/20.

12	School Travel Plans.	Promoting Travel Alternatives	School Travel Plans	Approach established	WSCC	WSCC/Defra Grants	Hands-up travel mode surveys in schools	0.01	Schools are directed to Modeshift Stars for assistance with travel planning, which is a nationally recognised online travel planning tool. Sussex air project working with Primary schools in Adur influenced travel patterns to/from school.	Ongoing	Focus on promoting sustainable travel amongst young people and reducing peak time car traffic. WSCC Bikeability have been engaging the schools with cycle training (lots of work with primary and secondary schools across Adur to offer cycle training. The Sussex-air/Defra funded project is hoped to have influenced school travel plans.
13	Promotion of LEV's	Public Information	via the Internet	2015	Adur DC/Worthing BC	LA/OLEV grants	Number of LEV's	0.01	EV points being requested for new developments. New Rapid charge point at Lancing Manor due 2020. Grant funding signposted on Council website.	Ongoing	Developer contributions/installation of EV charge points continues to be sought at new developments; WSCC Parking Standards require % provision of ev charge points.
14	Car Sharing	Public Information	via the Internet	Webpage	WSCC	WSCC	Website hits/journeys planned/Number of registrants/take-up of initiatives	1-5%	Car share website now https://liftshare.com/uk/community/westsussexcarshare	Ongoing	Focus on promoting sustainable travel/car. Link on Adur website.
15	Public Health Information Campaigns	Public Information	Via the Internet	Ongoing	Adur DC/Worthing BC/WSCC	Adur DC/Worthing BC/WSCC	Number of promotional events, publications, social media. Annual increase in air alert subscribers	<1%	Liaison with WSCC Public Health/Sustainability Teams who have supported the promotion of air Alert through part funding the service and supporting publicity.	Ongoing	Attempt to reduce car journeys/increase walking and cycling, particularly through the AQMA, promotion of air Alert. (Title changed from 'Health & Wellbeing Promotion')
16	Air Quality Monitoring and availability of AQ information	Public Information	via the Internet	2006	Adur DC	Adur DC	Reduction in levels of NO2	N/A	Air Quality Monitoring station in Shoreham High Street -results available via Sussex-air website, link on Council's website.	Ongoing	
17	Transport network infrastructure improvements for new development	Traffic Management	UTC, Congestion management, traffic reduction	Approach established	WSCC	WSCC/developer contributions	Number of infrastructure improvements	<1%	Development funding contributions continue to be sought for identified schemes in Shoreham High Street and Norfolk	Ongoing	Focus on minimising traffic congestion. Finding suitable funding had been an issue, hence delays.

									Bridge		
18	Anti-idling promotion	Traffic Management	Anti-idling enforcement	2007	Adur DC /WSCC	WSCC/Adur DC/Sussex-air	Localised air quality monitoring	N/A	New anti-idling signs placed at level crossings and other stationary traffic hotspots, funded by Adur DC and Sussex-air. Sussex-air Defra funded anti idling around schools campaign at various schools, ongoing into 2019.	Ongoing	Campaigns to promote anti-idling more generally being considered e.g. social media campaign.
19	New infrastructure for cyclists and pedestrians	Transport Planning and Infrastructure	Cycle network	Ongoing	WSCC	WSCC/developer contributions	Length of new cycle routes provided	<1%	Adur DC published the draft Local Cycling & Walking Infrastructure Plan (LCWIP) in late 2019. Cycle route improvements across the Borough, mainly through contributions from developments. Schemes/routes identified in West Sussex Walking and Cycling Strategy 2016	Ongoing	Minimising the impacts of traffic on local streets
20	Shoreham High Street and Norfolk Bridge infrastructure improvements to reduce traffic flow conflicts with car, bus and taxi bays, and improve access and public realm within the High Street	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	Ongoing	WSCC	WSCC	Number of projects delivered	1-5%	Feasibility work undertaken through Shoreham Town Centre Study 2014. Schemes identified for preliminary design development in WSCC Annual Delivery Programme 2020-21; Further discussion is required with Members and stakeholders regarding these schemes.	Ongoing	Focus on smoothing traffic flow to reduce stop/star and improve air quality
21	Shoreham Area Sustainable Transport Package Feasibility	Transport Planning and Infrastructure	Other	2018/19	WSCC	WSCC/developer contributions	Cycle counter flows, traffic counts, travel behaviour surveys		Feasibility Study completed for the development of high quality cycling facilities from Adur Ferry Bridge to	Est. 2023	Focus on promoting sustainable transport and minimising car use and vehicle congestion

	Study								Brighton and Hove on the A259. Dialogue has continued with developers regarding safeguarding land for this scheme, and to secure funding contributions		
22	Taxi Fleet Emission Improvements	Promoting Low Emission Transport	Taxi Licensing conditions	2017-19	Adur DC	Adur DC/OLEV grants	Number of taxi's replaced with better Euro standard models	0.01	Discussions on fleet improvements through minimum standards. No further progress.		Work to develop during 2019, implementation phase moved to 2020. District wide improvement will have some limited effect in High Street, particularly at taxi rank

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Adur District Council continues to develop its approach to address $PM_{2.5}$ in partnership with West Sussex Public Health and other Sussex local authority officers through Sussex-air. The Clean Burn campaign, funded through the Sussex-air Defra funding, ran through 2019 and into 2020, in an attempt to reduce particulate emissions from domestic burning. The results will be reported in next year's ASR.

We have updated domestic burning guidance on our website linking to the Clean Burn campaign.

The District Council has considered the declaration of Smoke Control Areas. However there are considerable barriers to this, most notably associated with non-compliant stoves and fireplaces existing at the time of any declaration. This would also require political and public support.

Adur & Worthing Councils monitor levels of $PM_{2.5}$ through an AURN affiliated continuous monitoring station at Grove Lodge, Worthing (A27), which will assist us with assessing any $PM_{2.5}$ issues in the area. The annual mean for $PM_{2.5}$ in Worthing in 2019 was 9.9µgm^{-3}.

Work carried out by Public Health England as part of the Public Health Outcomes Framework (PHOF) shows that the mortality associated with particulate air pollution within Adur District Council is 4.4 %. This information is available from the following web link: http://www.phoutcomes.info/search/air#page/1/gid/1/pat/6/par/E12000008/ati/101/are/E07000223/iid/30101/age/230/sex/4

The figure below shows that the mortality calculated for Adur District Council is less than that calculated for south east England (4.9 %) and England (5.1 %) as a whole.

Fraction of mortality attributed to particulate air pollution in Adur District Council

Compared with benchmark Better Similar Worse Lower Similar Higher Not Compared

Benchmark Value

Worst/Lowest 25th Percentile 75th Percentile Best/Highest

Indicator	Period	Adur		Region	England	England		
		Count	Value	Value	Value	Worst/ Lowest	Range	Best/ Highest
3.01 - Fraction of mortality attributable to particulate air pollution	2014	-	4.4%	4.9%	5.1%	8.3%		2.6%

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Adur District Council undertook automatic (continuous) monitoring at one site during 2019. Table A.1 in Appendix A shows the details of this site.

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. National monitoring results are available at https://uk-air.defra.gov.uk/.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

It is important to mention here that the national air quality objectives apply to sites where there is 'relevant exposure'. These are normally taken to be the facades of residential premises, schools etc. and do not cover scenarios such as passing pedestrians. Therefore measured levels are often predicted back to represent the nearest relevant exposure as required by TG(16) using standard prediction methods and tools.

3.1.2 Non-Automatic Monitoring Sites

Adur District Council undertook non-automatic (passive) monitoring of NO_2 at 24 sites using 26 tubes during 2019. Table A.2 in Appendix A shows the details of the sites.

The following sites were removed for 2019:

1) S1 Albion Street (A259), Southwick as levels had dropped each year and the adjacent residential properties were demolished;
2) S16 Kings Road, Lancing an urban background site showing levels consistently around 16ug/m^3
3) S38 The Ham, Eastern Avenue Shoreham – a tube was placed here for one year to see what the levels were at the skatepark. Recorded levels were 22.9ug/m^3, well below the annual mean objective.

The tubes were relocated at 3 new sites for 2019:

1) S43 Brunswick Road Shoreham – close to a level crossing at Shoreham station;
2) S44 Upper Brighton Road Lancing, close to the Lancing Manor roundabout on the A27;
3) S45 Dolphin Mews Shoreham, close to another level crossing on Eastern Avenue.

Maps showing the location of monitoring sites are provided in Appendix D. Scalable maps are also available at https://www.adur-worthing.gov.uk/maps/general-map/ (tick the Air Quality Management Areas box to the left side of the map).

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.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[6], "annualisation" (where the data capture falls below 75%), and distance correction[7]. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. Note that the concentration data presented in Table A.3 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).

[6] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[7] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

For diffusion tubes, the full 2019 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.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Continuous monitoring in Shoreham High Street resumed in 2018 with NOx measurements in May 2018 and PM_{10} in September 2018. Therefore 2019 presents us with the first full years dataset since 2015.

The annual mean measured at the continuous monitoring site for 2019 was 26µg/m^3. This is comfortably below the objective of 40µg/m^3. There were no recorded exceedances of the one hour mean objective of 200µg/m^3. Data capture was 94%.

Of the 26 diffusion tubes used in 2019 all 23 of those that existed in 2018 showed a decrease in measured annual means during 2019, with reductions ranging from 1.7µg/m^3 at St. Mary's Close Sompting (S40) to 5.1µg/m^3 at West Street Shoreham (S27).

No monitoring sites exceeded the annual mean objective of 40µg/m^3 during 2019.

The highest annual mean recorded was 38.4µg/m^3 at a new site S44 Upper Brighton Road, Lancing. This monitoring site is located at the roadside (within 1-5m of a busy road) adjacent to the westbound A27 dual carriageway. The closest receptor is over 5m away and when predicted back to the façade the level reduces to 30.9µg/m^3.

Around the AQMA, West Street (S27) decreased again, this time by 5.1µg/m^3 to 26.9µg/m^3 and Victoria Road (S36) decreased by 2.4µg/m^3 to 24.3µg/m^3. Monitoring at Humphrey's Gap (S37) produced a level of 29.1µg/m^3. The level in 2018 was deemed unreliable as it was affected by adjacent construction works so the tube had to be moved a few times.

In September 2018 we placed a tube on a facade adjacent to the continuous monitoring site in Shoreham High Street in order to try and more accurately measure levels at a site of relevant exposure (S42). Levels recorded in 2019 were 29.4µg/m^3, well below the annual mean objective. Interestingly this was higher than the results obtained from the continuous monitor at the kerbside a few metres away. This could be due to the effect of a building overhang trapping pollutants near the facade.

We believe the actions listed in section 2 are assisting with year on year reductions alongside the national trend towards a cleaner vehicle fleet. We remain hopeful that increased awareness of air quality is resulting in more people changing their behaviour – cycling and walking, eco-friendly driving, etc. As with last year it remains feasible that alternative routes are being used to avoid the AQMA as it suffers from congestion during many parts of the day, although the number of alternative routes is limited. We remain unable to compare annual average traffic levels through the High Street as there has been no West Sussex County Council (WSCC) automatic traffic counter (ATC) in place since 2016. West Sussex County Council continue to review options for replacement.

As with previous reports, we must keep the measured levels in AQMA1 under review before making decisions on the future of the AQMA. The large number of approved major developments have yet to begin construction. Alongside other planned major developments for the Adur District (as detailed in section 2), we still do not consider revocation of the AQMA is a reasonable option at this time. This was a view endorsed in the review of last year's ASR.

Levels in AQMA2 have reduced slightly over 2017 levels. Site S8 recorded a level of 27.5µg/m^3 down another 3µg/m^3 and site S9 reduced by almost 4µg/m^3 to 31.1µg/m^3. Both are roadside locations and levels drop further when predicted back to the nearest receptors, 4m and 2m away respectively. These are well below the annual mean objective. In previous ASR's we advised that we would consider revoking AQMA2 in Southwick as measured levels had been below the annual mean objective for a number of years. We now propose to do this in 2020.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3 (with a gap during 2016-17 where no monitoring took place).

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

The annual mean for 2019 was 24.3µg/m^3, below the objective of 40µg/m^3 (data capture rate 96%). There were 8 recorded exceedances of an hourly mean of 50µg/m^3. The objectives state there should be no more than 35 exceedances of this national level in any given year. This is well below that limit.

3.2.3 Particulate Matter ($PM_{2.5}$)

Error! Reference source not found. in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years.

Adur District Council does not monitor levels of $PM_{2.5}$. Therefore an estimate of $PM_{2.5}$ concentrations has been made following the guidance contained within Technical Guidance LAQM TG16. See Appendix C for the calculation.

The estimate of $PM_{2.5}$ concentrations is 17µg/m^3. This is much higher than the measured level in Worthing, another roadside site, which was 9.9µg/m^3 in 2019. As the calculated level is an estimation, the result needs to be treated with caution. Further, the measured PM_{10} level is well below the annual mean objective, suggesting the fraction of $PM_{2.5}$ will also be lower.

Adur District Council will consider options for monitoring $PM_{2.5}$ in Shoreham High Street.

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)
AD1	High Street Shoreham	Kerbside	521399	105039	NO2; PM10	YES	Chemiluminescent; BAM	4.0	1.6	2.0

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
S2	Old Mill Close Fishersgate	Roadside	525330	105085	NO2	NO	3.5	1.5	NO	2.5
S3	St. Aubyns Crescent Fishersgate	Urban Background	525562	105313	NO2	NO	5.1	2.4	NO	2.5
S7	Queens Road Southwick	Urban Background	524139	106321	NO2	NO	3.0	2.5	NO	3.0
S8	Underdown Road Southwick	Roadside	524018	106070	NO2	YES	4.3	2.3	NO	2.5
S9	Old Shoreham Road Southwick	Roadside	523784	106081	NO2	YES	1.6	2.8	NO	2.3
S10	Holmbush Roundabout Shoreham	Roadside	523343	106111	NO2	NO	27.0	1.7	NO	2.7
S11	Lancing Manor Lancing	Roadside	518820	105584	NO2	NO	14.8	2.0	NO	3.0
S12	Boundstone Lane Lancing	Roadside	517731	105505	NO2	NO	N/A	1.8	NO	3.0
S13	Upper Brighton Road Sompting	Roadside	517291	105550	NO2	NO	8.6	4.6	NO	2.5
S14	West Street Sompting	Urban Background	516057	105190	NO2	NO	3.7	1.1	NO	2.0
S15	Western Road Lancing	Roadside	517512	103367	NO2	NO	6.4	1.5	NO	2.7
S17	High Street AQMS 1 Shoreham	Kerbside	521400	105040	NO2	YES	5.0	0.9	YES	2.6

S18	High Street AQMS 2 Shoreham	Kerbside	521400	105040	NO2	YES	5.0	0.9	YES	2.6
S19	High Street AQMS 3 Shoreham	Kerbside	521400	105040	NO2	YES	5.0	0.9	YES	2.6
S25	Mash Barn Lane Lancing	Roadside	519117	105710	NO2	NO	N/A	6.0	NO	2.5
S26	Loose Lane Sompting	Suburban	516536	104783	NO2	NO	12.0	0.8	NO	2.5
S27	West Street Shoreham	Roadside	521371	105087	NO2	NO	0.2	1.4	NO	2.8
S36	Victoria Road Footpath Shoreham	Roadside	521282	105254	NO2	NO	5.8	1.9	NO	2.8
S37	Humphrey's Gap Shoreham	Roadside	522103	105126	NO2	NO	0.5	1.7	NO	3.0
S39	Brighton Road Kingston	Kerbside	523329	104960	NO2	NO	4.0	1.2	NO	3.0
S40	St. Mary's Close Sompting	Suburban	516466	105171	NO2	NO	4.7	0.8	NO	3.0
S41	North Road Lancing	Roadside	518238	104432	NO2	NO	0.2	2.0	NO	3.0
S42	High Street Shoreham	Roadside	521390	105039	NO2	YES	0.0	4.1	YES	2.6
S43	Brunswick Road Shoreham	Roadside	521733	105251	NO2	NO	0.0	2.7	NO	2.5
S44	Upper Brighton Road Lancing	Roadside	518494	105464	NO2	NO	5.4	2.0	NO	3.0
S45	Dolphin Mews Shoreham	Roadside	522300	105258	NO2	NO	0.0	4.7	NO	2.5

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3) (4)				
							2015	2016	2017	2018	2019
AD1	521399	105039	Kerbside	Automatic	93.6	93.6	**48.3 (45.2)**	**N/A**	**N/A**	**29.2**	**26.0**
S2	525330	105085	Roadside	Diffusion tube	92.5	92.5	**23.9**	**24.9**	**26.4**	**27.0**	**23.6**
S3	525562	105313	Urban Background	Diffusion tube	100.0	100.0	**15.5**	**17.5**	**17.2**	**18.1**	**16.7**
S7	524139	106321	Urban Background	Diffusion tube	100.0	100.0	**12.9**	**14.8**	**15.1**	**15.9**	**14.1**
S8	524018	106070	Roadside	Diffusion tube	100.0	100.0	**27.8**	**30.4**	**32.8**	**30.4**	**27.5**
S9	523784	106081	Roadside	Diffusion tube	100.0	100.0	**32.1**	**34.5**	**35.8**	**35.0**	**31.1**
S10	523343	106111	Roadside	Diffusion tube	100.0	100.0	**22.2**	**25.2**	**24.6**	**27.0**	**23.2**
S11	518820	105584	Kerbside	Diffusion tube	100.0	100.0	**33.0**	**35.6**	**36.3**	**35.1**	**32.5**
S12	517731	105505	Kerbside	Diffusion tube	100.0	100.0	**30.1**	**31.1**	**31.4**	**30.2**	**25.8**
S13	517291	105550	Kerbside	Diffusion tube	100.0	100.0	**35.5**	**38.3**	**40.3**	**39.0**	**36.3**
S14	516057	105190	Urban Background	Diffusion tube	100.0	100.0	**18.8**	**20.4**	**19.5**	**19.5**	**23.7**
S15	517512	103367	Roadside	Diffusion tube	100.0	100.0	**27.3**	**29.3**	**30.5**	**32.5**	**27.7**
S17	521400	105040	Kerbside	Diffusion tube	100.0	100.0	**38.1**	**38.4**	**38.1**	**33.7**	**30.4**

S18	521400	105040	Kerbside	Diffusion tube	100.0	100.0	**38.0**	**39.1**	**37.8**	**32.8**	**30.9**
S19	521400	105040	Kerbside	Diffusion tube	100.0	100.0	**40.1**	**40.9**	**37.8**	**32.4**	**29.6**
S25	519117	105710	Roadside	Diffusion tube	100.0	100.0	**27.2**	**28.8**	**28.9**	**30.4**	**26.2**
S26	516536	104783	Suburban	Diffusion tube	90.7	90.7	**13.3**	**15.4**	**14.3**	**16.5**	**13.4**
S27	521371	105087	Kerbside	Diffusion tube	100.0	100.0	**N/A**	**33.5**	**33.9**	**32.1**	**26.9**
S36	521282	105254	Roadside	Diffusion Tube	100.0	100.0	**N/A**	**N/A**	**26.1**	**26.6**	**24.3**
S37	522103	105126	Roadside	Diffusion Tube	100.0	100.0	**N/A**	**N/A**	**41.0**	**32.6**	**29.1**
S39	523329	104960	Kerbside	Diffusion Tube	100.0	100.0	**N/A**	**N/A**	**N/A**	**26.1**	**21.9**
S40	516466	105171	Suburban	Diffusion Tube	100.0	100.0	**N/A**	**N/A**	**N/A**	**17.8**	**16.1**
S41	518238	104432	Roadside	Diffusion Tube	100.0	100.0	**N/A**	**N/A**	**N/A**	**23.2**	**20.8**
S42	521390	105039	Roadside	Diffusion Tube	100.0	100.0	**N/A**	**N/A**	**N/A**	**34.5**	**29.4**
S43	521733	105251	Roadside	Diffusion Tube	100.0	100.0	**N/A**	**N/A**	**N/A**	**N/A**	**22.5**
S44	518494	105464	Roadside	Diffusion Tube	82.7	82.7	**N/A**	**N/A**	**N/A**	**N/A**	**38.4**
S45	522300	105258	Roadside	Diffusion Tube	100.0	92.1	**N/A**	**N/A**	**N/A**	**N/A**	**19.1**

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

☒ **Annualisation has been conducted where data capture is <75%**

☒ **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 adjustment**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

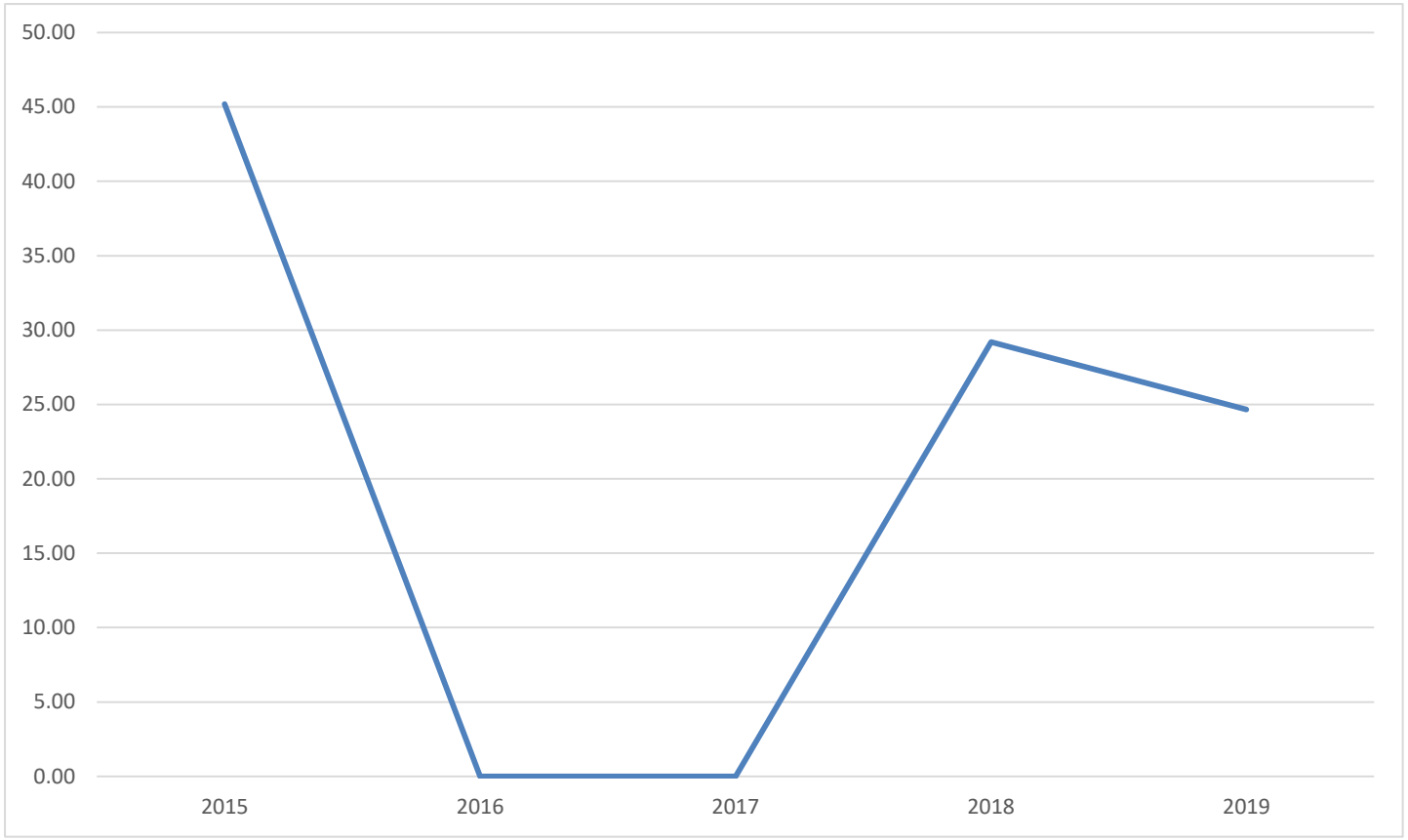
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

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

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

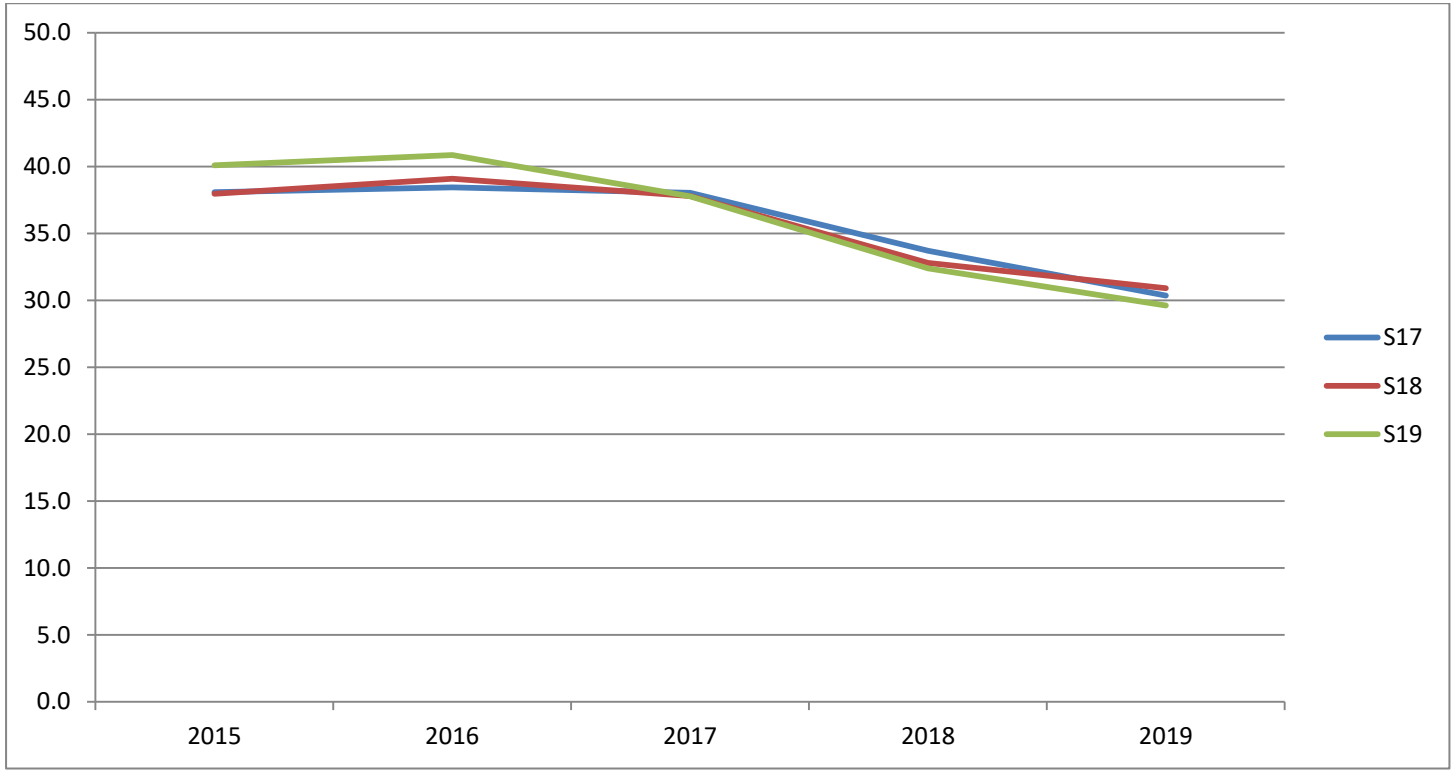
Figure A.1 – Trends in Annual Mean NO_2 Concentrations ($\mu g/m^3$)

A1.1 - Trend in measured NO_2 at continuous monitoring site AD1 within AQMA 1 Shoreham High Street

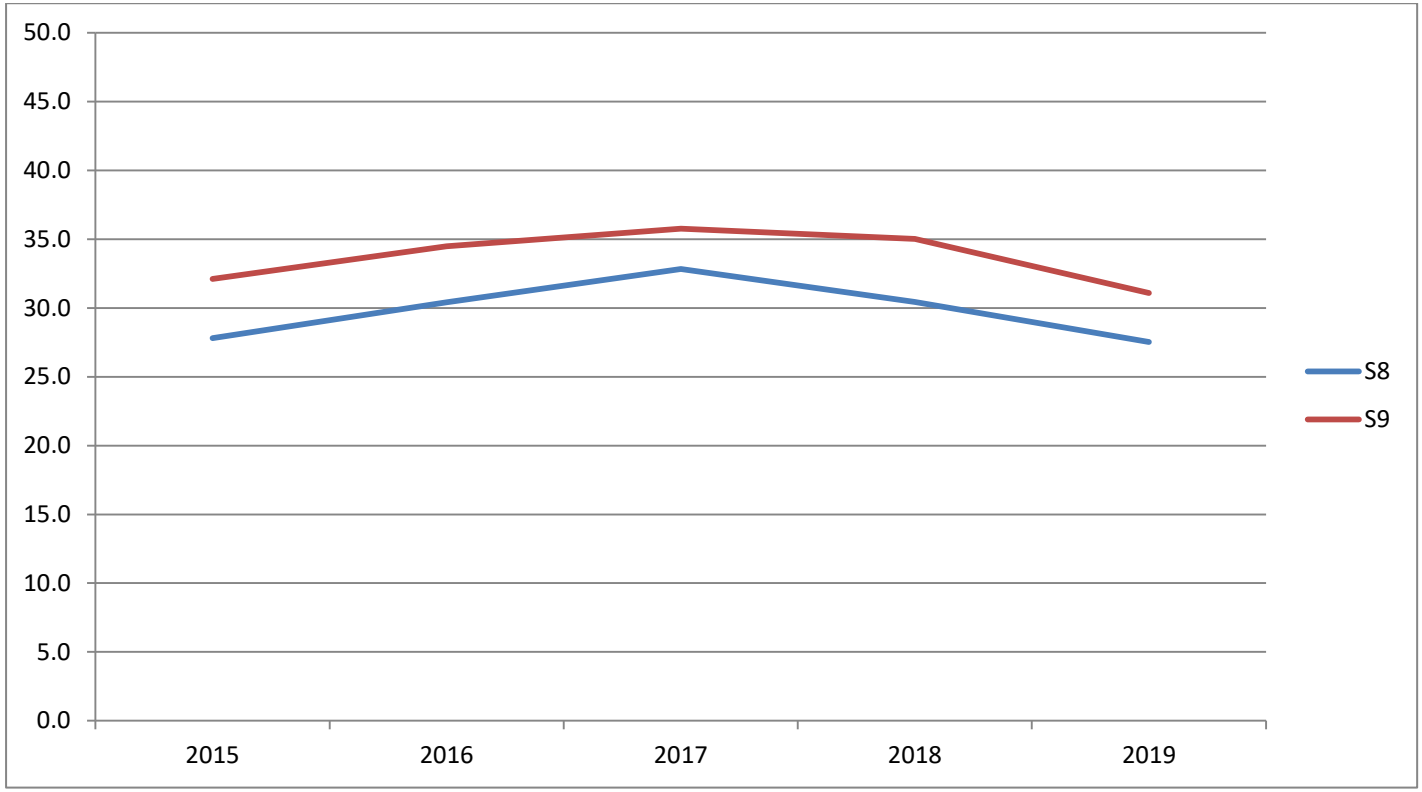


Note: No data for 2016 or 2017

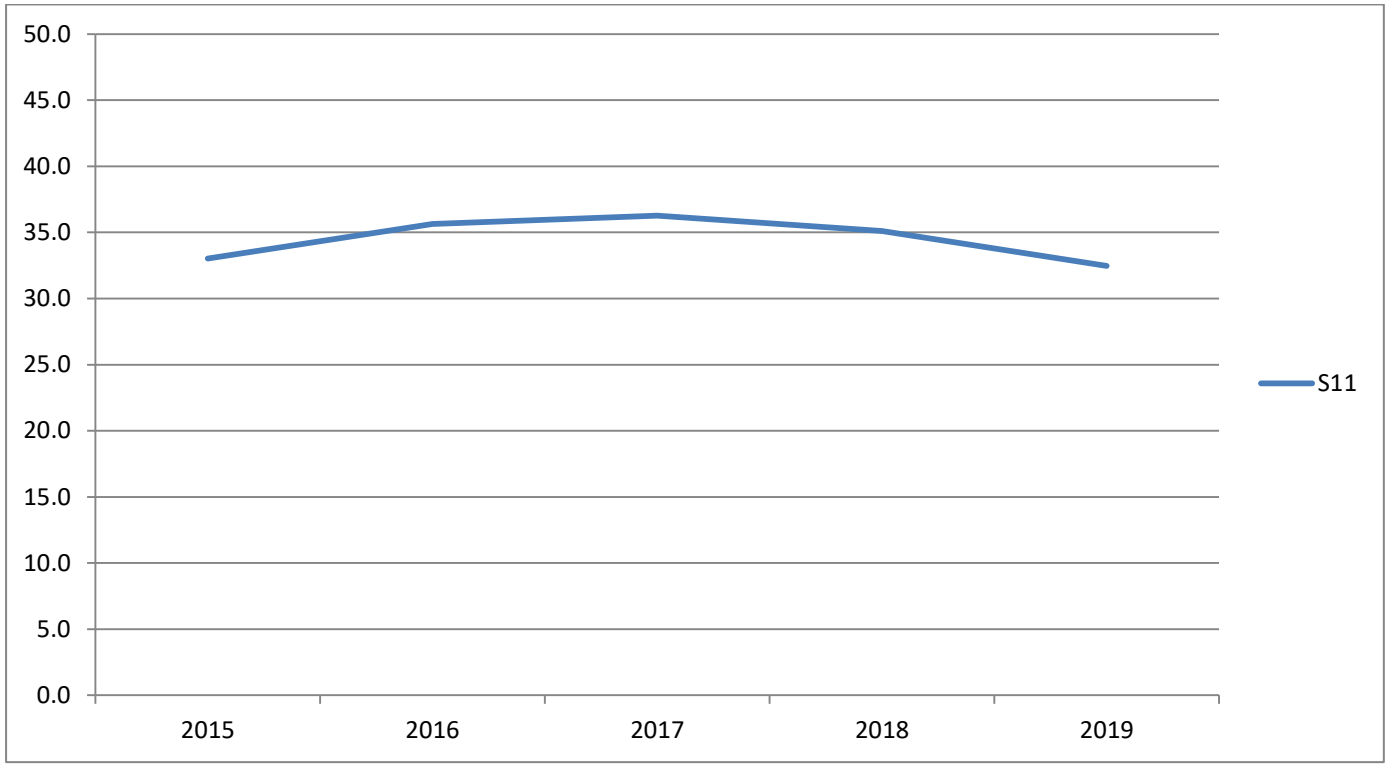
A1.2 - Trends in measured NO_2 at co-located sites S17/18/19 within AQMA 1 Shoreham High Street



A1.3 - Trends in measured NO_2 at sites S8 and S9 within AQMA 2



A1.4 -Trend in measured NO_2 at site S11 (Lancing Manor, Lancing)



A1.5 -Trend in measured NO2 at site S13 (Upper Brighton Road Lancing)

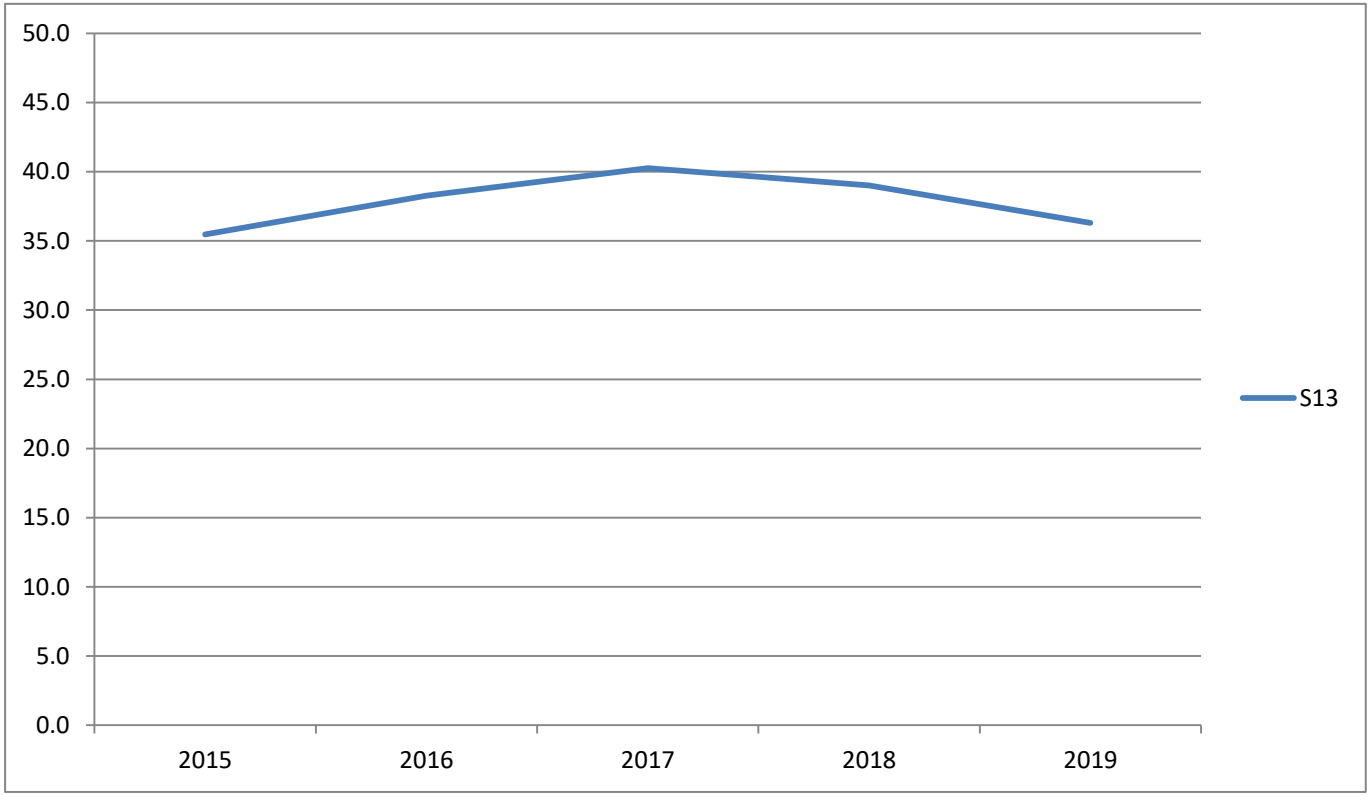


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
							2015	2016	2017	2018	2019
AD1	521399	105039	Kerbside	Automatic	93.6	93.6	**N/A**	**N/A**	**N/A**	**0**	**0**

Notes:

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

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

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

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

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} Annual Mean Concentration (µg/m³) (3)				
						2015	2016	2017	2018	2019
AD1	521399	105039	Kerbside	96.0	96.0	N/A	N/A	N/A	23	24.3

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the PM_{10} annual mean objective of 40µg/m³ are shown in **bold.**

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

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
						2015	2016	2017	2018	2019
AD1	521399	105039	Kerbside	96.0	96.0	**N/A**	**N/A**	**N/A**	**0**	8

Notes:

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations ($\mu g/m^3$)												Annual Mean		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.87) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
S2	525330	105085	30.9	37.0	28.7	26.0	24.7	22.1	21.9	24.1	21.6	26.3	29.7	33.1	27.2	23.6	23.6
S3	525562	105313	23.6	24.4	18.7	19.2	15.3	15.5	15.1	-	14.7	13.8	27.5	22.7	19.1	16.7	16.7
S7	524139	106321	22.8	26.0	16.6	13.9	13.5	11.0	6.5	12.5	12.3	16.6	23.0	20.1	16.2	14.1	14.1
S8	524018	106070	39.3	41.2	32.5	26.5	26.9	25.5	25.5	29.5	26.1	31.5	39.8	35.4	31.6	27.5	27.5
S9	523784	106081	43.7	43.5	39.0	34.2	35.8	23.7	29.6	32.0	31.9	36.9	44.0	34.6	35.7	31.1	31.1
S10	523343	106111	29.9	30.1	27.9	26.6	22.6	21.8	21.1	20.4	20.6	31.4	39.1	28.2	26.6	23.2	23.2
S11	518820	105584	44.9	40.0	41.0	34.4	34.8	30.6	31.2	36.2	35.9	37.9	40.3	40.6	37.3	32.5	32.5
S12	517731	105505	40.6	37.2	30.5	30.3	26.9	27.0	25.0	24.0	26.2	19.9	41.1	27.3	29.7	25.8	25.8
S13	517291	105550	38.1	49.5	39.3	39.2	38.4	41.1	46.0	47.7	39.9	34.4	41.1	46.2	41.7	36.3	29.6
S14	516057	105190	30.5	34.7	23.7	26.2	23.1	23.3	24.7	23.3	24.2	25.5	34.0	33.0	27.2	23.6	23.6
S15	517512	103367	41.8	38.5	28.8	29.7	29.5	31.5	28.8	27.6	30.2	30.7	33.7	31.2	31.8	27.7	27.7
S17	521400	105040	41.0	41.0	39.4	30.4	32.7	31.7	30.4	31.0	30.1	35.0	38.7	37.3	34.9	30.4	30.4
S18	521400	105040	42.7	41.2	35.6	32.8	33.3	32.2	30.6	35.3	32.1	35.9	38.6	36.1	35.5	30.9	30.9
S19	521400	105040	37.9	43.2	34.5	30.9	33.7	31.9	31.3	33.7	29.4	32.5	40.0	29.7	34.0	29.6	29.6

S25	519117	105710	39.2	33.0	33.7	26.1	27.1	25.7	26.0	26.1	28.1	31.4	36.7	27.8	30.1	26.2	26.2
S26	516536	104783	22.9	20.2	15.4	14.2	13.6	11.6	12.0	10.8	11.4	-	20.5	17.3	15.4	13.4	13.4
S27	521371	105087	37.2	36.9	30.3	27.1	29.5	24.0	27.7	28.4	24.3	32.6	38.7	34.5	31.0	26.9	26.9
S36	521282	105254	39.1	34.6	29.0	30.9	25.5	24.7	22.7	22.7	22.6	26.7	32.9	23.4	27.9	24.3	24.3
S37	522103	105126	40.3	37.8	34.0	33.0	28.1	30.3	34.6	34.1	23.9	32.0	38.1	35.8	33.5	29.1	29.1
S39	523329	104960	35.9	32.3	28.7	24.6	21.7	20.3	17.8	18.8	18.9	24.6	31.1	27.0	25.1	21.9	21.9
S40	516466	105171	26.5	24.1	17.4	18.4	15.5	13.7	12.7	14.1	15.4	20.5	23.5	20.1	18.5	16.1	16.1
S41	518238	104432	26.7	29.6	25.8	26.2	21.1	18.2	19.3	21.8	19.6	25.4	30.0	23.3	23.9	20.8	20.8
S42	521390	105039	38.3	42.8	34.7	28.9	29.7	29.2	30.2	33.7	30.5	34.3	35.5	38.0	33.8	29.4	29.4
S43	521733	105251	36.2	34.0	29.9	23.8	22.2	20.1	21.0	22.1	19.7	23.6	31.4	25.9	25.8	22.5	22.5
S44	518494	105464	48.1	51.1	39.1	42.1	42.5	41.4	-	-	38.4	43.4	48.9	46.0	44.1	38.4	30.9
S45	522300	105258	-	25.1	23.4	21.8	20.4	19.1	18.9	18.7	20.0	24.1	27.2	22.5	21.9	19.1	19.1

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

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

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure. Distance correction is not necessary for sites below 36 ug/m^3 - see LAQM TG16 paragraph 7.78.

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

Automatic Monitoring Site

The automatic continuous monitoring site in Shoreham High Street is part of the Sussex-air monitoring network (www.sussex-air.net/). The site is serviced every 6 months and Local Site Operator (LSO) routine calibrations are completed by Adur District Council approximately every 2 weeks.

Diffusion Tube Bias Adjustment Factors

NO_2 diffusion tubes are provided and analysed by Gradko laboratory. The NO_2 tube preparation method used is 50% triethanolamine (TEA) in Acetone**.**

Data from the NO_2 diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location database available from Defra, http://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html

The bias adjustment factor used for 2019, obtained via tools at the aforementioned website, was **0.87**.

QA/QC of diffusion tube monitoring

All diffusion monitoring data has been ratified following the methods described in LAQM.TG(16). A quality assurance / quality control (QA/QC) programme including field duplicates and blanks, and instrument calibration with standard gases has been followed (AEAT, 2000).

Fall off with Distance Calculations

Screen shots of the falloff of NO_2 concentration with distance from kerb calculator spreadsheet (downloaded from the LAQM website) are shown below, with the calculations for sites S13 and S44, both Upper Brighton Road, Lancing.

S13 Upper Brighton Road, Lancing

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	4.6	metres
Step 2	How far from the KERB is your receptor (in metres)?	12.3	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	12.74	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	36.3	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	29.6	µg/m^3

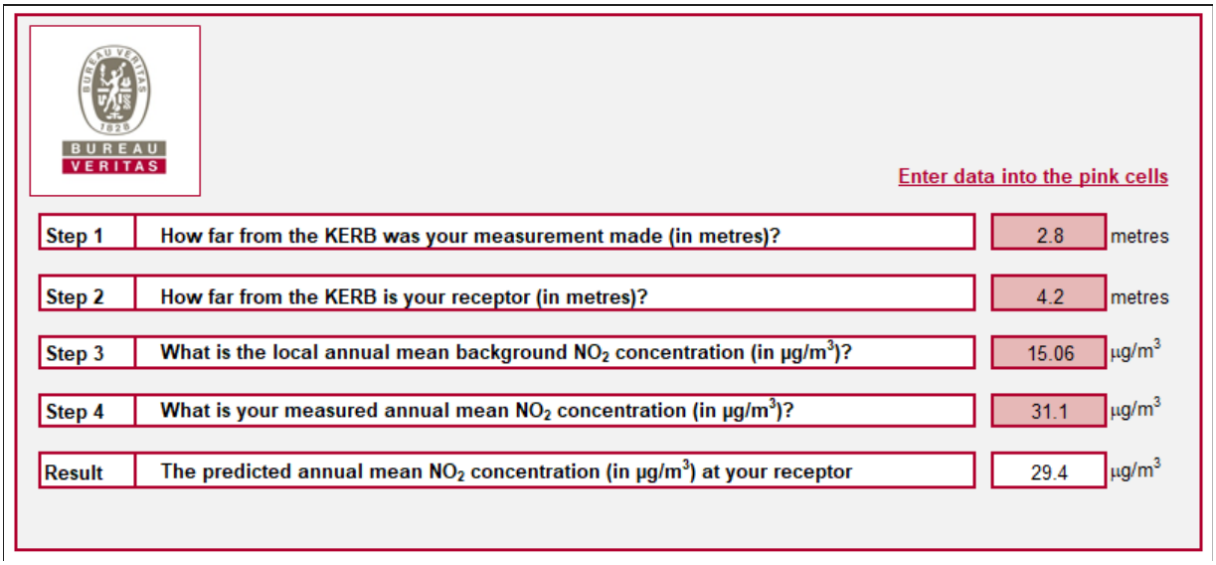
S44 Upper Brighton Road, Lancing

NO2-Fall-Off-With-Distance-from-Roads-Calculator-v4.2 [Compatibility Mode]

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	7.4	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	13.8	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	38.4	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	30.9	µg/m^3

S9 Underdown Road Southwick



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.8	metres
Step 2	How far from the KERB is your receptor (in metres)?	4.2	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	15.06	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	31.1	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	29.4	µg/m^3

Estimation of $PM_{2.5}$ using the National Factor

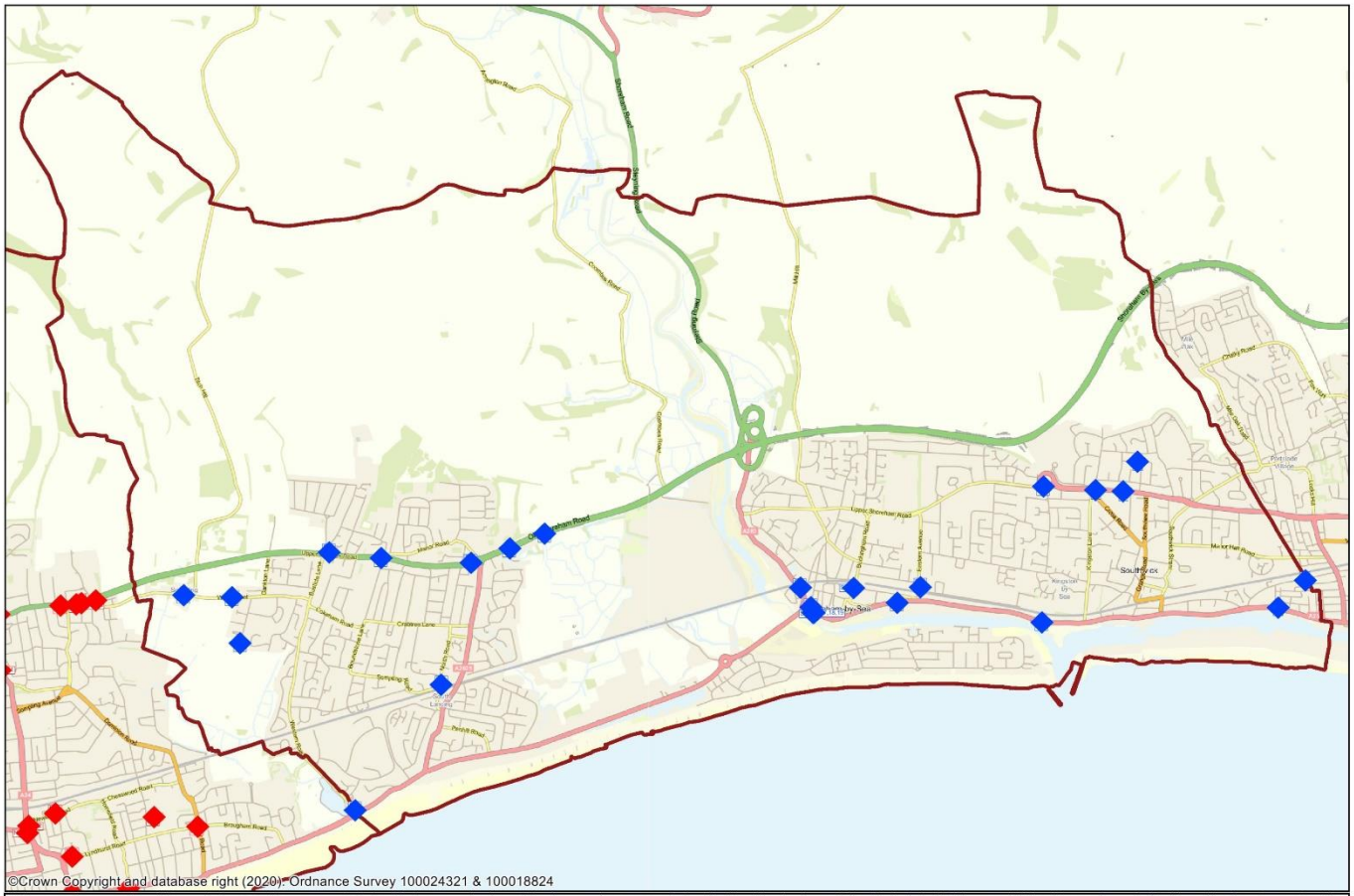
Recorded annual mean concentration at roadside site in 2019 was 24.3µg/m^3.

Step 1: Multiply the annual mean PM_{10} concentration by the nationally derived correction factor: 24.3 x 0.7 = 17

Step 2: Estimated annual mean $PM_{2.5}$ = 17µg/m^3

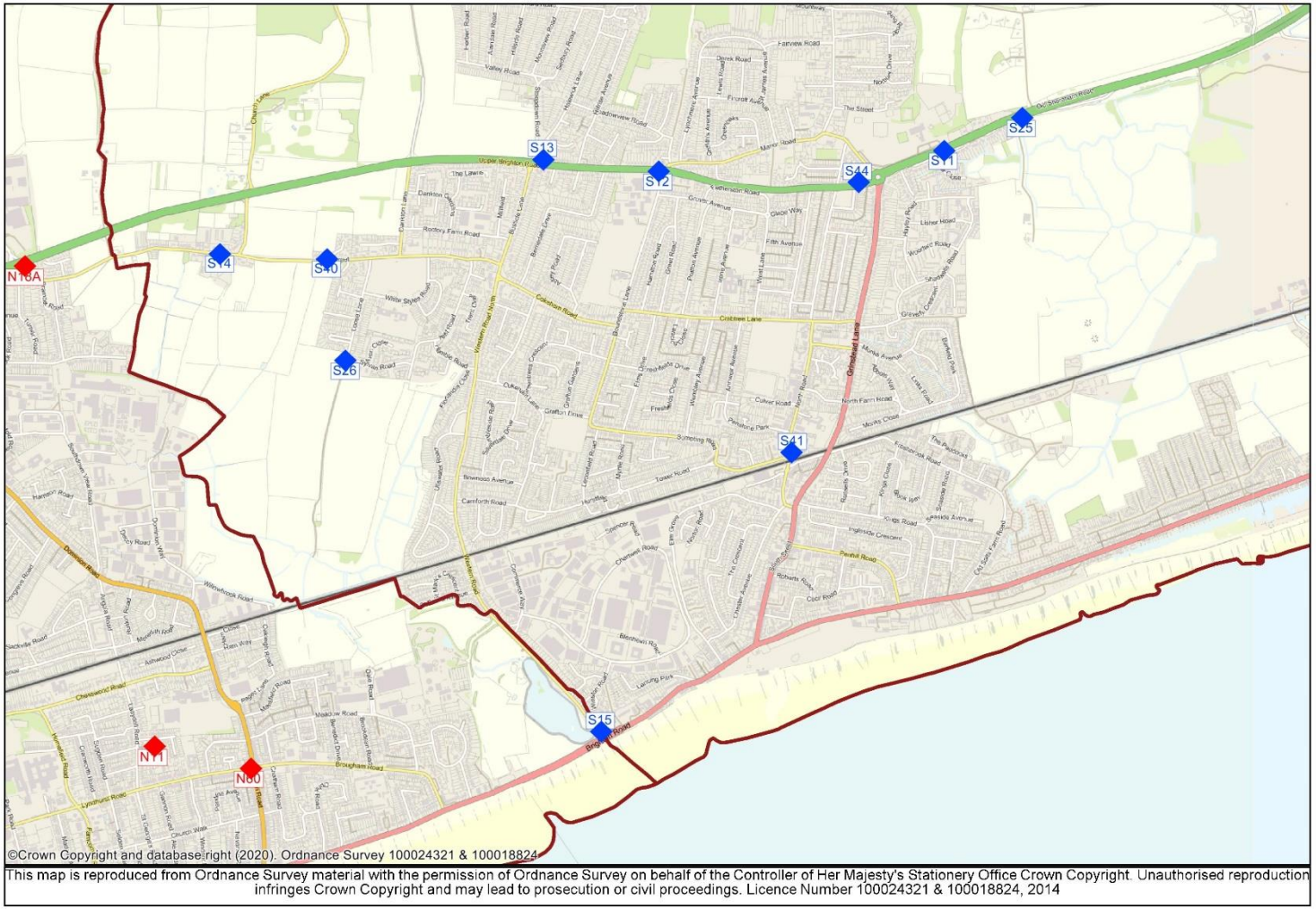
Appendix D: Map(s) of Monitoring Locations and AQMAs

D.1 Adur District (showing spatial distribution of monitoring sites)



D.2 Adur East

D.3 Adur West


S13
S12
S44
S11
S25
S14
S10
N16A
S26
S41
S15
N11
N60
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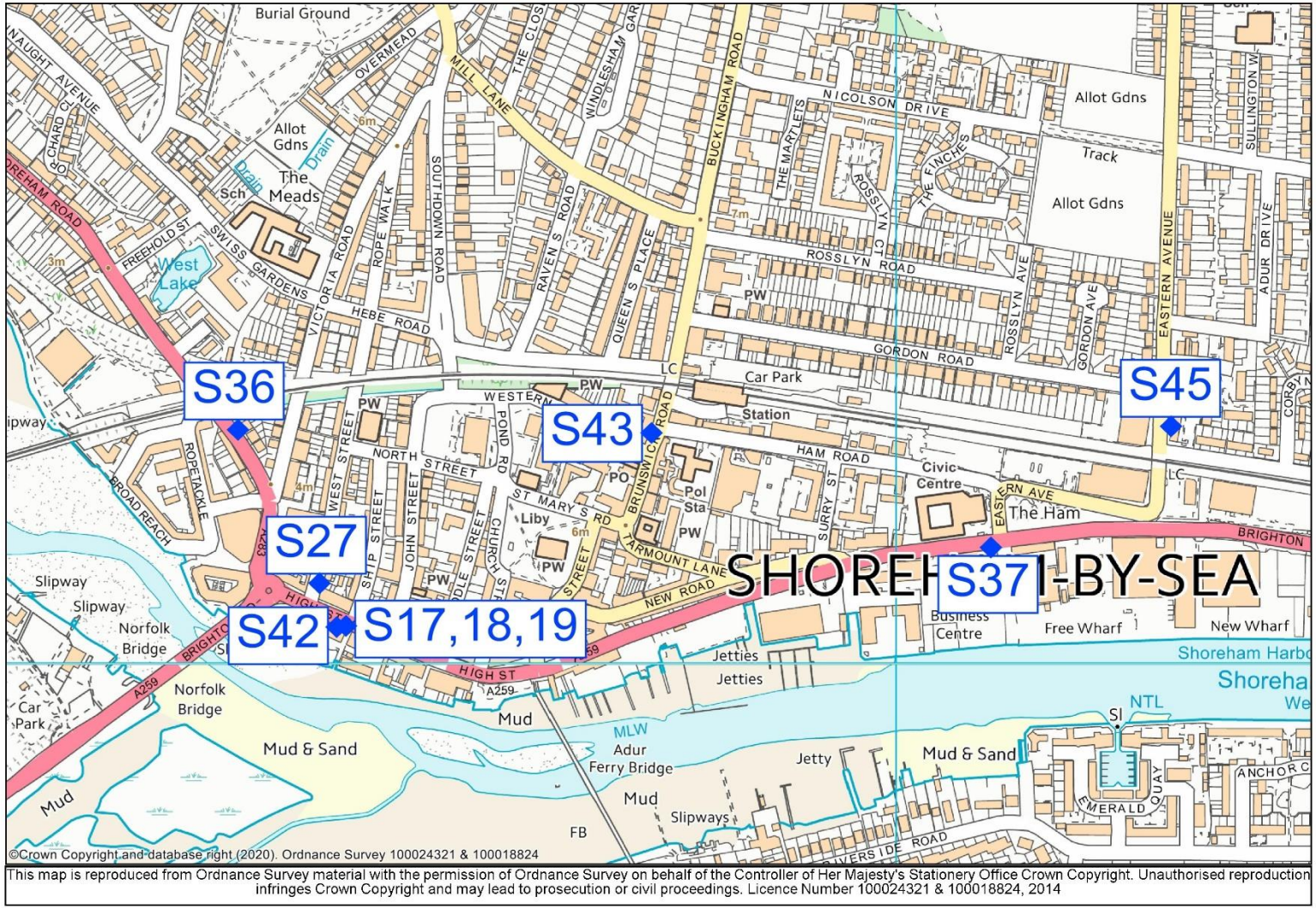
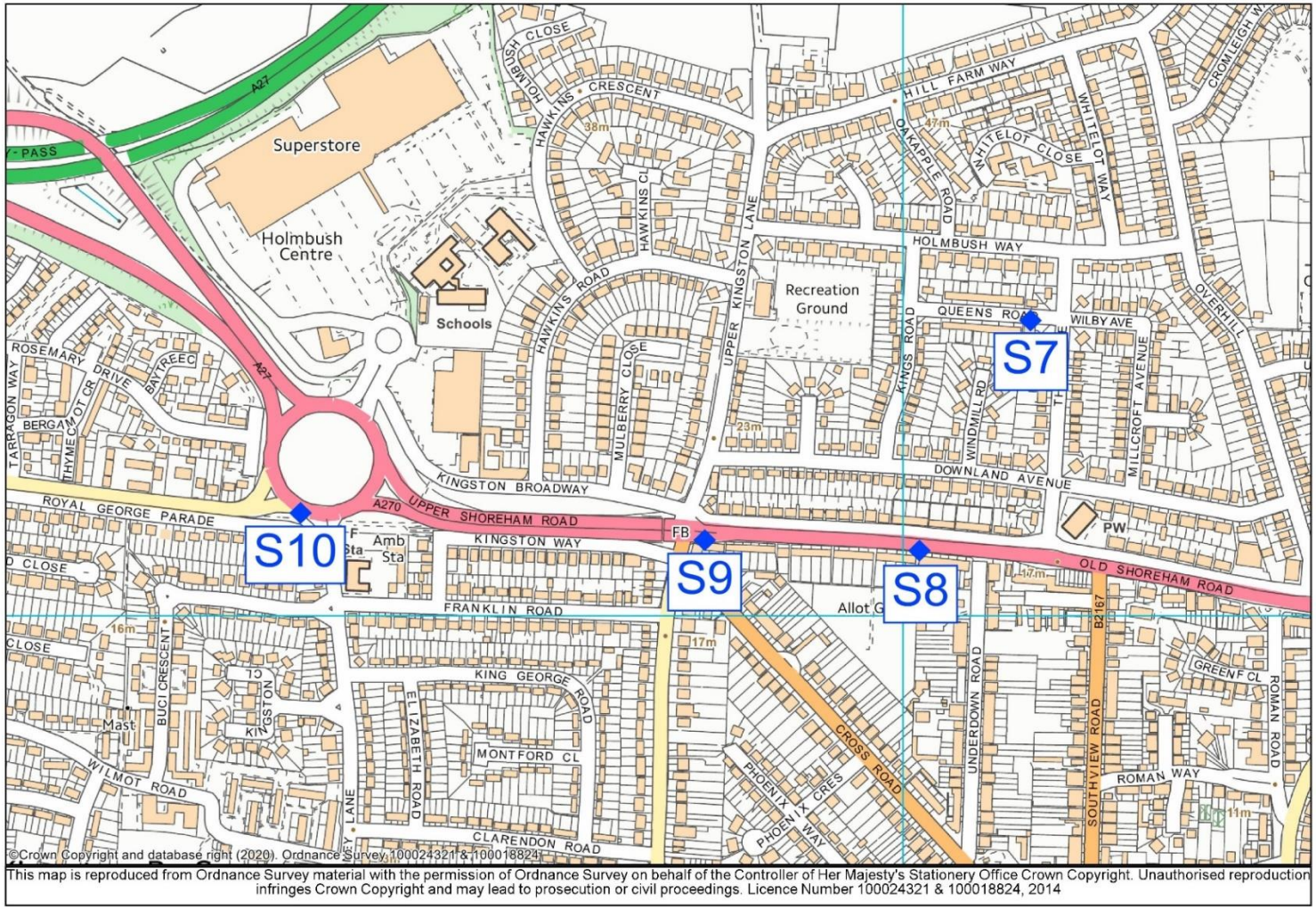
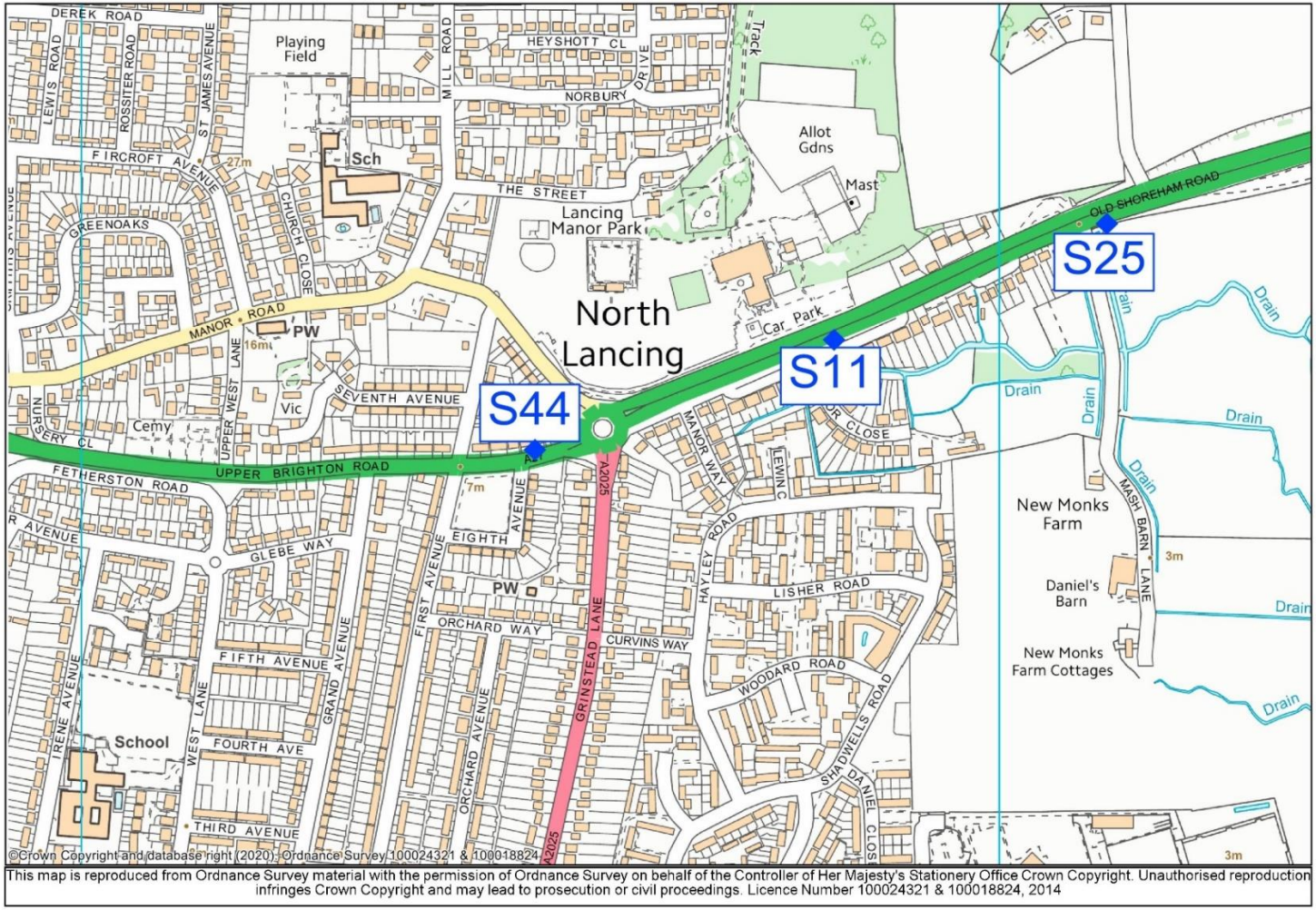
D.4 Shoreham AQMA (No.1)



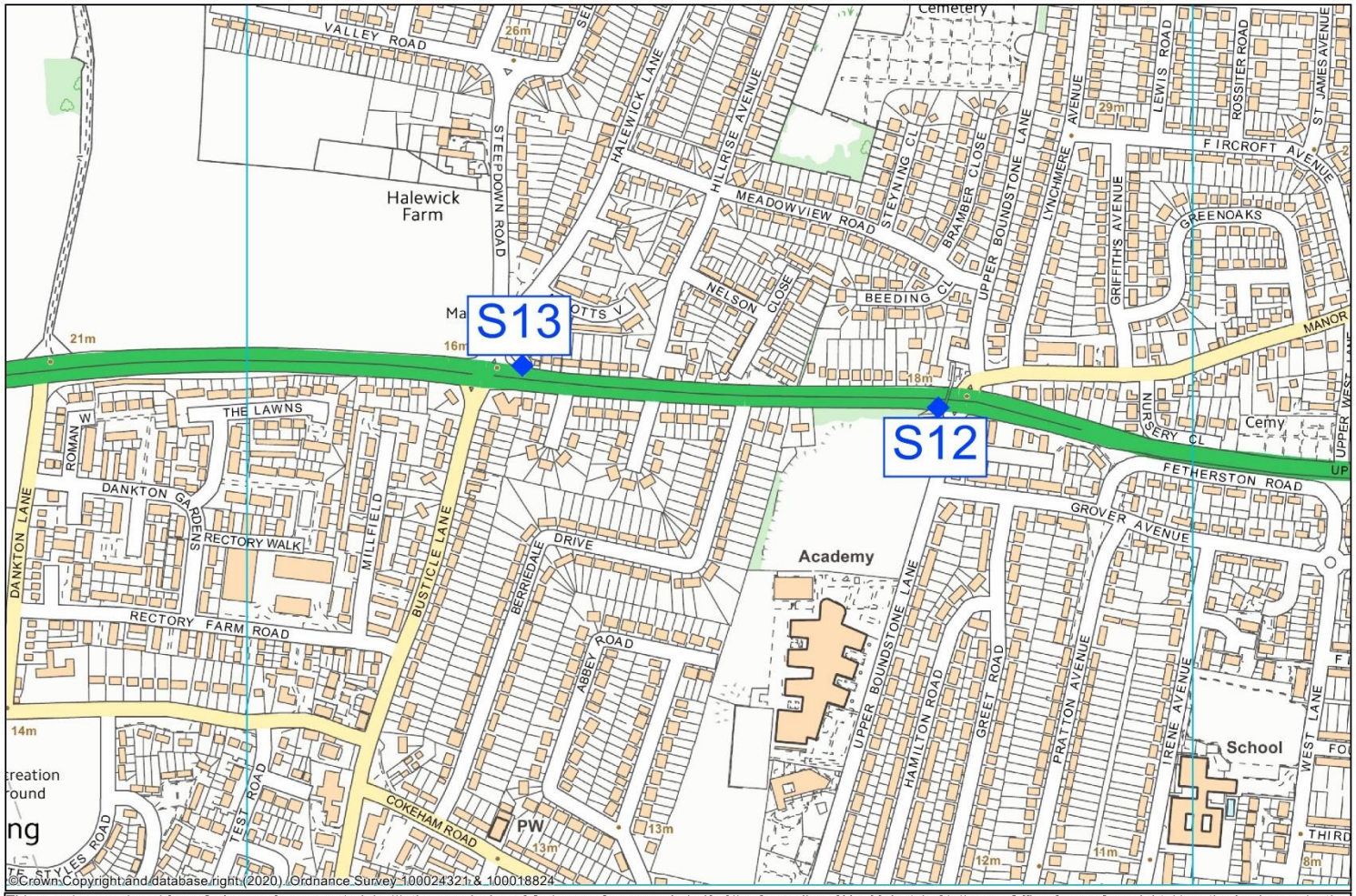
D.5 Southwick AQMA 2



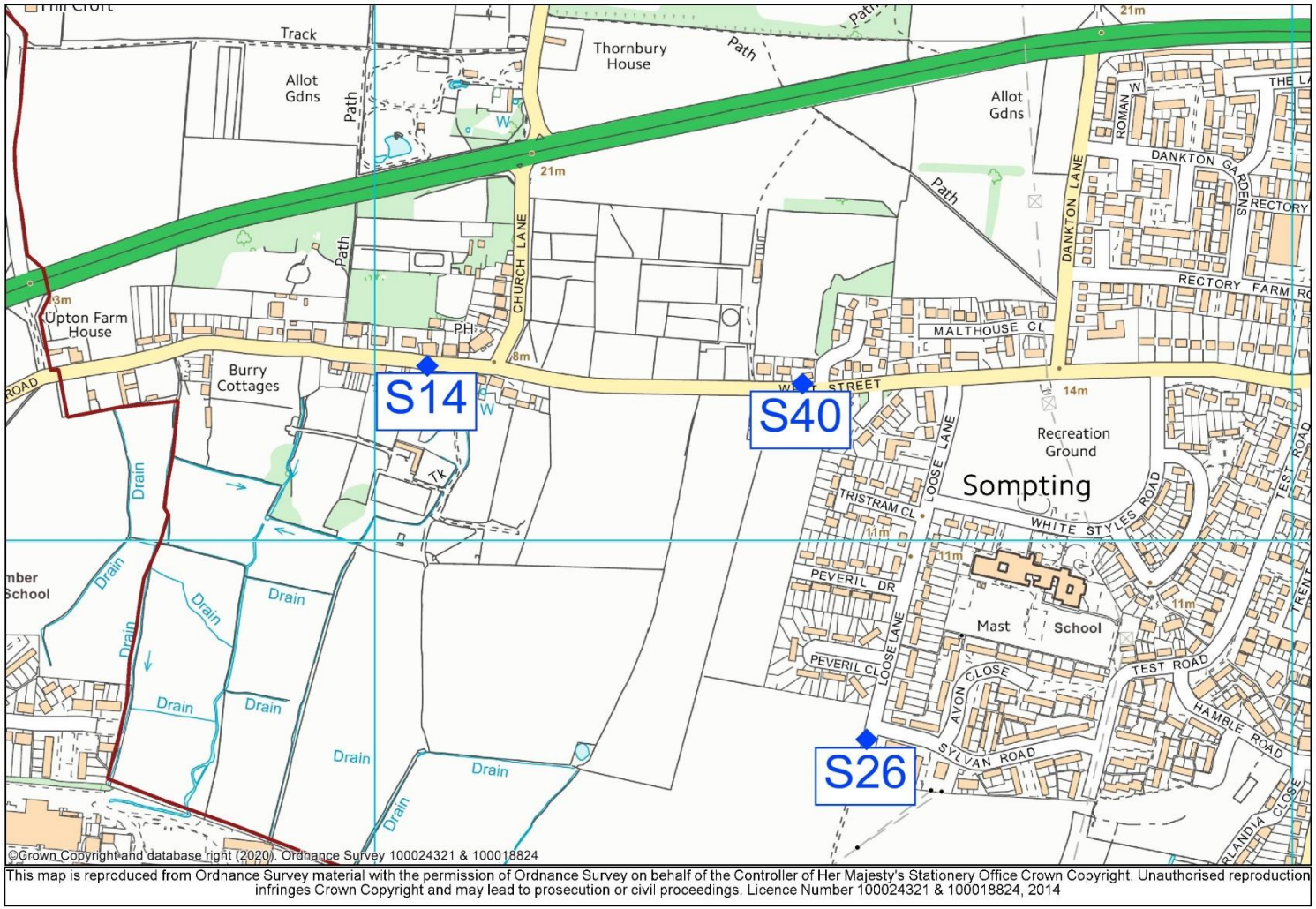
D.6 North Lancing



D.7 A27 Lancing



D.8 Sompting


S14
S40
S26
Track
Allot Gdns
Path
Thornbury House
21m
CHURCH LANE
Upton Farm House
PH
Burry Cottages
8m
MALTHOUSE CL
WEST STREET
14m
Recreation Ground
Sompting
DANKTON LANE
DANKTON GARDENS
RECTORY
RECTORY FARM
ROMAN
LOOSE LANE
TRISTRAM CL
WHITE STYLES ROAD
TEST ROAD
PEVERIL DR
PEVERIL CL
Mast
School
AVON CLOSE
HAMBLE ROAD
SYLVAN ROAD
Drain
11m
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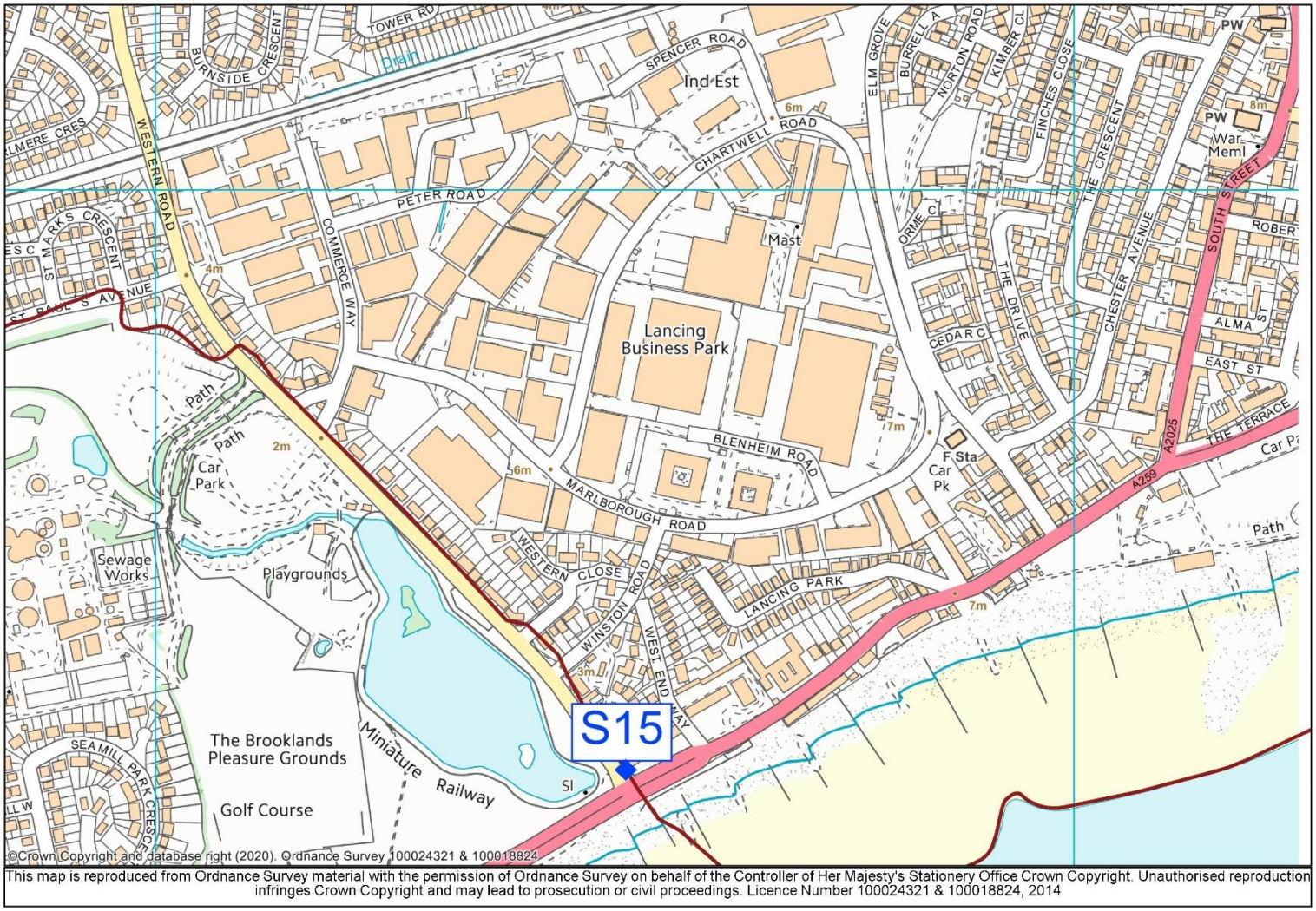
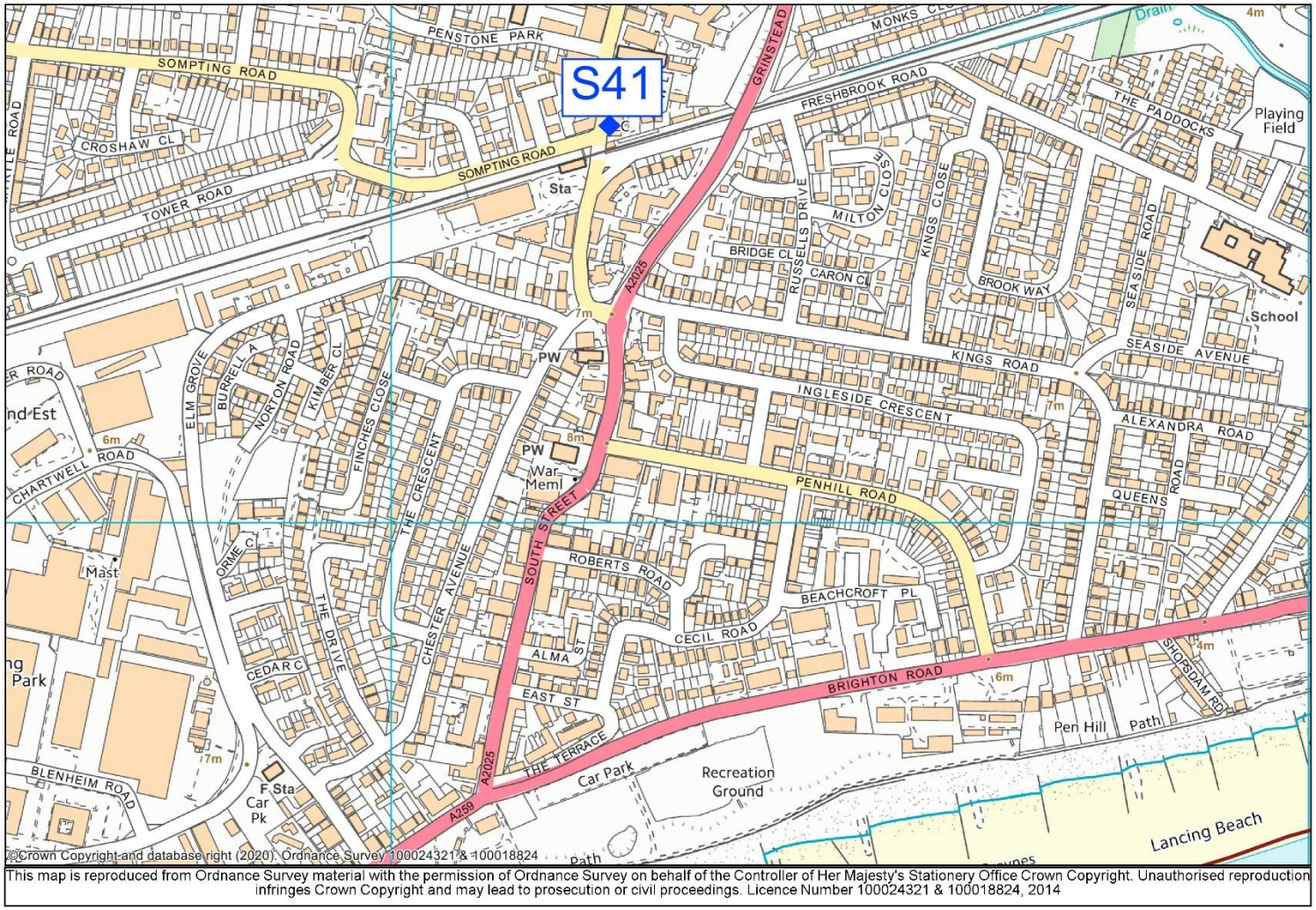
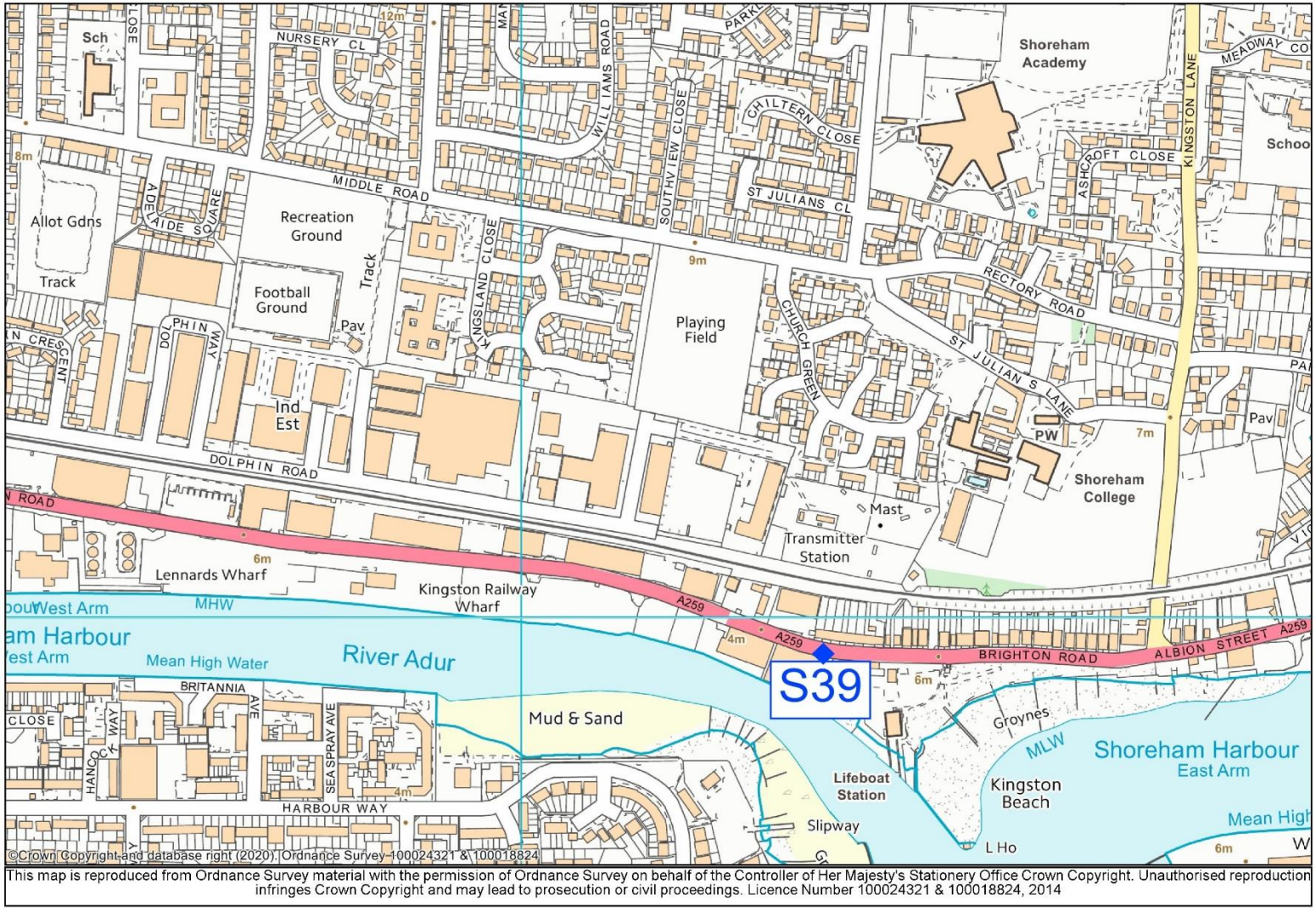
D.9 Brooklands



D.10 Lancing



D.11 Kingston



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[8]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[8] 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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
HE	Highways England
HGV	Heavy Goods Vehicle
LAQM	Local Air Quality Management
LGV	Light Goods Vehicle
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
ULEV	Ultra-Low Emission Vehicles
WSCC	West Sussex County Council

References

Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006, Defra, Report Number AEAT/ENV/R/2170. Available from UK-AIR https://uk-air.defra.gov.uk/assets/documents/reports/cat09/0701110944_AQinequalitiesFNL_AEAT_0506.pdf

Local Air Quality Management Technical Guidance (TG16), Defra
Available from https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf

Local Air Quality Management Policy Guidance (PG16), Defra
Available from
https://consult.defra.gov.uk/communications/laqm_changes/supporting_documents/LAQM%20Policy%20Guidance%202016.pdf

Air Quality and Emission Mitigation Guidance for Sussex (2019)
Available from https://www.sussex-air.net/

NO_2 Fall-Off with Distance Calculator available from:
http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Defra Background Maps for Adur
https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017