

Air Quality- Update on the Development of a new Air Quality Action Plan

Cabinet - 8 July 2021

Report of: Chief Officer Planning & Regulatory Services

Status: For Decision

Also considered by:

- Cleaner & Greener Advisory Committee - 29 June 2021

Key Decision: Yes

Executive Summary:

Air Quality in Sevenoaks District has shown a trend of improvement and as a result the District Council can now consider revoking up to 5 of our 9 existing AQMA.

Whilst these improvements are very encouraging, we recognise that there is no safe exposure level to pollution. The District Council will therefore continue to identify and implement measures to reduce pollution in our remaining AQMA.

The District Council is currently developing its new Air Quality Action Plan. This document provides a commitment to undertaking measures and actions to improve air quality within our designated Air Quality Management Areas (AQMA). Agreement is sought on this process.

This report supports Sevenoaks District Councils own Net Zero 2030 commitment and its wider ambition for the district'

Portfolio Holder: Cllr. McArthur

Contact Officer: Nick Chapman, Ext. 3160

Recommendation to Cleaner and Greener Advisory Committee:

That the recommendations a) to i) below be recommended to Cabinet.

Recommendation to Cabinet:

- a) That officers approach DEFRA to request the revocation of the M20 AQMA on the basis of the assessment undertaken by BV
- b) That officers approach DEFRA to request the revocation of the M25 AQMA (PM10) on the basis of the assessment undertaken by BV

- c) That officers approach DEFRA to request the revocation of the M20 AQMA on the basis of the assessment undertaken by BV
- d) That officers approach DEFRA to request the revocation of the M25 AQMA (PM10) on the basis of the assessment undertaken by BV
- e) That, subject to additional monitoring demonstrating that NO2 levels do not exceed objective levels at the roundabout at London Road, Westerham and residential properties along the A224 and B221 near to the M25, that officers approach DEFRA to request revocation of the M25 AQMA (NO2)
- f) That, subject to additional monitoring demonstrating that NO2 levels do not exceed objective levels at receptors along the A224 London Road flyover, that officers approach DEFRA to request revocation of the M26 AQMA.
- g) That, subject to additional monitoring demonstrating that NO2 levels do not exceed objective levels at residential properties at Phillip Avenue/ Ladds Way/ Cyclamen Road, Swanley, that officers approach DEFRA to request revocation of the A20 AQMA.
- h) That the Deputy Chief Executive and Chief Officer for Planning and Regulatory Services, following consultation with the Portfolio Holder for Cleaner and Greener, be authorised to constitute a Working Group of up to 15 Members and Officers (with a quorum of 5) to develop a shortlist of workable measures to be tested (scenario testing) to quantify their impact upon Air Quality within the AQMA and to explore possible measures which could be included within the Action Plan. Such a Working Group is to report to the next Cleaner and Greener Advisory Committee.
- i) That, the District Council withdraw from the 'Air Alert' scheme as provided by Sussex Air and Imperial College and agree that alternate and comparable information/ links are made available via our website.

Current Air Quality Trends

- 1 The Department of Environment and Rural Affairs (DEFRA) require the District Council to analyse and publish its air quality monitoring data on an annual basis. Each published report details the monitoring results from the preceding year (i.e. the 2020 report contains 2019 data).
- 2 Before data can be published, it needs to be independently validated (undertaken by the Imperial Environmental Research Group on behalf of the District Council) and then bias adjusted (corrected in accordance with real time monitoring data). The latest full year of data is 2019 although as a

result of the National Lockdowns for Covid-19 it is unlikely that 2020 can be considered a representative year for air quality monitoring.

- 3 In 2019, only five (5) of our fifty seven (57) diffusion tubes recorded Nitrogen Dioxide (NO₂) levels above the national objective level. Further, once the data from these five diffusion tubes was corrected so that they represented relevant exposure (i.e. the façade of a dwelling) only one location recorded levels above the annual mean objective.
- 4 We did not monitor any exceedances (at the Air Quality Monitoring Stations), or likely exceedances (via diffusion tubes) of the NO₂ 1-hour mean objective in 2019.
- 5 Levels of small particulates (PM₁₀)(monitored only at the Air Quality Monitoring Stations) also remained well below objective levels for the same period.
- 6 These results continue an overall downwards trend in air pollution which has continued generally since 2013.
- 7 At present, the District Council is awaiting final analysis of our data from 2020. It is however anticipated that this will show that during the National Lockdowns when there was a significant drop in vehicles on the roads of Sevenoaks, there was a corresponding decrease in local NO₂ emissions.

Review of the existing Air Quality Management Areas

- 8 In February 2020, the Environmental Protection Team commissioned the specialist company Bureau Veritas (BV) to undertake a technical review of our AQMA. **This work utilised data obtained in 2018** (an outlying year in terms of the ongoing improvement in pollution levels) to remodel and validate the existing declared areas. As a result the results of the modelling can be considered conservative as pollution levels recorded in 2017 and 2019 were lower.
- 9 BV used air quality modelling, validated by our own monitoring data and the latest road traffic data for the district, to predict relevant human exposure within each of our existing AQMA.
- 10 BV were unable to undertake validation of the Swanley AQMA as there was insufficient traffic data available to carry out modelling.
- 11 As a result of this work, BV have made a number of recommendations regarding our existing AQMA which are outlined below;
 - a. M20 AQMA- can be considered for revocation due to no monitored exceedances at any of the monitoring locations, nor has the model predicted exceedances at any receptor locations within the AQMA. Additional monitoring could be carried out at specific receptor locations to confirm this as there are only 2 monitoring locations currently along the stretch of the AQMA.
 - b. M25 AQMA (NO₂)- As a consequence of the modelling results, additional monitoring is recommended to be carried out near the residential properties at the roundabout of London Road in

Westerham. Monitoring should also be carried out near to residential properties along the A224 and B2211 near to the M25. If these concentrations are shown to be compliant with the annual mean objective, then the AQMA can be revoked.

- c. M26 AQMA- The model predicted concentrations within 10% of the AQS objective at one location. Therefore, monitoring is recommended to be carried out close to this location, along the A224 London Road flyover. If these concentrations are shown to be compliant, then the AQMA can be revoked.
- d. A20 AQMA- No exceedances were predicted by the dispersion model within the AQMA. However, as no monitoring locations are present within the AQMA, it is recommended that monitoring be carried out close to residential properties on Phillip Avenue/Ladds Way/Cyclamen Road to confirm the modelled results. If no exceedances are reported, the AQMA should be revoked.
- e. A25 AQMA- Should remain in place. However the District Council could consider reducing the size of the AQMA boundary west of Westerham and east of Seal where no exceedances are predicted. Additional monitoring could be carried out to confirm this at residential properties along these stretches.

Additional monitoring should also be carried out near to the junction of London Road to the A25 Market Square in Westerham, as well as on the north-western side of the southern roundabout in Riverhead in order to determine whether there are any exceedances of the 1-hour NO₂ objective.

- f. A225 & A224 AQMA- the AQMA should remain in place. Additional monitoring carried out along the narrow section of the High Street near to the Bus Station, as well as at the closest point of relevant exposure to the A224 between the junctions to South Park and Lime Tree Walk. This is to ascertain whether there are any exceedances of the 1-hour NO₂ objective.
- g. M25 AQMA (PM₁₀)- Based upon the modelling results, no exceedances at relevant receptor locations are expected. Therefore, this AQMA can be revoked.

12 All of the additional monitoring recommended by BV has been already been installed. However, due to the suppressed traffic levels as a result of the Covid-19 pandemic, it is not clear when this monitoring will be representative of “normal” conditions. For example; pollution levels fell at the Bat & Ball roadside monitoring station by 22% in 2020 compared to 2019 levels.

13 It is also unclear if pre-Covid-19 levels of traffic will return and what the longer-term impact will be local air quality due to the shift towards home-working.

Source Apportionment

- 14 BV were able to use traffic data to undertake a pollution source apportionment exercise to help us identify the constituent parts of pollution in our AQMA. In effect, they are able to accurately predict the percentage of pollution at any monitored location from each vehicle type.
- 15 These modelling assessments have identified that Diesel Light Goods Vehicles and Diesel Cars are the two principle sources of roadside nitrogen dioxide pollution.
- 16 In Sevenoaks Town Centre, more than 60% of the measured NO₂ is derived from these sources and in almost all AQMA they make up more than 50% of the measured NO₂ emission.
- 17 Within Sevenoaks Town Centre, Heavy Goods Vehicles account for approximately 4.6% of the NO₂ emission and across all AQMA account for a much smaller percentage of the total emissions.
- 18 Whilst HGVs are directly responsible for a lower proportion of emissions, it needs to be recognised that the modelling cannot take account of pollution emissions that indirectly result from congestion caused by HGVs.

Air Quality Action Plans

- 19 A Local Authority has a statutory duty to develop an air quality action plan to identify and implement measures to improve air quality within its AQMA.
- 20 Our current Action Plan was developed in 2009, and whilst it was recognised at the time as a model document for other authorities to follow, most of the actions it contains have now been completed or are no longer relevant.
- 21 The District Council is now moving forward to develop a new, up to date and more relevant plan, which will allow us to continue driving improvements in air quality over the next 5-10 years.
- 22 Although Air Quality within Sevenoaks District is improving, and modelling/ monitoring shows that much of the district is now compliant with UK air quality standards; there is no safe level of exposure to air pollution.
- 23 It is therefore in the interests of residents that we continue to work to improve local air quality and that we strive to reduce exposure to pollution as far as possible.
- 24 There is an intrinsic link between measures which seek to improve local air quality and those which can help to mitigate climate change.

Environmental benefits that are achieved through schemes to reduce use of private vehicles and which encourage the use of public transport or active travel help reduce both NO₂ and CO₂ emissions and can therefore have a significant influence on the District Council's work to achieve 'Net Zero'.

- 25 In order to develop the AQMA, the District Council needs to develop a new schedule of measures which will reduce emissions within our AQMA. These measures will be assessed using computer modelling (scenario testing) to quantify the reductions of pollution levels associated with their implementation.
- 26 It is proposed that a joint officer and Councillor technical group will be created to develop a short list of potential measures which may be appropriate to reduce pollution within the AQMAs. The potential measures will undergo scenario testing by BV.
- 27 The group ought to include a member from each of the following wards affected:
 - Seal & Weald
 - Sevenoaks Eastern
 - Sevenoaks Northern
 - Dunton Green & Riverhead
 - Sevenoaks Town & St Johns
 - Brasted, Chevening & Sundridge
 - Westerham & Crockham Hill
 - Swanley Christchurch & Swanley Village
 - Swanley White Oak
 - Swanley St Mary's
- 28 The shortlisted options, together with the results of the scenario testing shall be reported to the Cabinet for consideration and agreement to formally adopt those measures.
- 29 Following agreement and adoption of the measures, the District Council will publish its new Air Quality Action Plan and will begin implementation or investigation of the identified measures.

Air Alert

- 30 Councillors may be aware that Sevenoaks District Council is currently a member of the Air Alert scheme operated by Sussex Air in partnership with Imperial College London (formerly Kings College).
- 31 This system enables members of the public to subscribe to 'free' text message alerts or download a mobile application to receive alerts when Air Quality within Sevenoaks District is expected to be poor.
- 32 When the District Council joined Air Alert, there were very few systems that predicted pollution in an area. At that time there was a very clear benefit to our residents by providing them with access to the warning system.

- 33 Unfortunately, despite efforts to encourage residents to subscribe to the service it has always been underutilised and consequently the health benefit from the service has never been quantifiable.
- 34 There are now several other services (operated by private companies as well as national organisations) which effectively provide the same information as Air Alert. These sources of information have become more accessible in recent years as personal digital technology has improved. For example the Met Office now provides forecasting for each region of the UK and this data is easily available via the government’s website (<https://uk-air.defra.gov.uk/forecasting/>).
- 35 Residents are able to subscribe on the DEFRA website to an email mailing list or to an “RSS Feed” which provides the following services:
- a. **Measurement:** Summary of last 24-hour’s or last hour’s air quality measurement data.
 - b. **Forecasts:** Daily updated forecasts of UK air pollution concentrations up to 24-hours ahead.
 - c. **Alert:** If the Alert Threshold in an Air Quality Daughter Directive is exceeded then an alert is issued.
- 36 This information replicates and enhances that provided by Air Alert. The District Council can therefore continue to positively influence public health by signposting residents to this service on our website and assisting existing users to switch to the DEFRA service.

Background Information

- 37 Air Pollution is now widely recognised as a life limiting environmental factor. Not only does it contribute to chronic health conditions, including respiratory disease, heart disease and cancer, but following the verdict and recommendations of the coroner in the case of Ella Kissi-Debrah (April 2021) it has now been shown as a direct cause of premature death.
- 38 It is estimated that between 28,000 and 36,000 early deaths are attributable to air pollution each year in the UK. Public Health England estimates that by 2035, the cumulative health and social care costs of air pollution in England could reach £5.3 billion.
- 39 Air pollution particularly impacts upon children, the elderly or those with pre-existing conditions. Asthma UK reports that two thirds of people with asthma believe that poor air quality makes their condition worse. This is because pollution can quickly irritate airways triggering asthma symptoms (Asthma UK, 2021).
- 40 Sources of air pollution are multiple and context specific. The major outdoor pollution sources include residential energy (for cooking and heating), vehicle emissions, power generation, agriculture/ waste incineration and industry (WHO, 2021). Indoor air pollutants include

residential fuels, aerosols, solvents, cleaning products, Volatile Organic Compounds (VOC's) (emitted by furnishings) and smoking.

- 41 The Air Quality in any area is affected by two primary components; background and localised pollution sources.
- 42 Background pollution can be defined as that which is found in an area but cannot easily be attributed to a particular or localised source. Some types of pollution are highly mobile and once in the atmosphere can travel considerable distances. It is therefore entirely possible for the Air Quality in a local authority's area to be influence by transcontinental pollution.
- 43 Localised sources of air pollution include vehicle emissions (from the combustion of fuels and degradation of tyres and brakes), localised industry, construction, home energy and agriculture.
- 44 In addition the air quality in an area is heavily influenced by prevailing climatic conditions. Pollution levels are generally worse in still conditions as wind can help disperse particulates and gases. During warmer periods sunlight reacts with primary pollutants such as Nitrogen Dioxide (NO₂) to form secondary pollutants such as Ozone (O₃). O₃ is a cause of urban smogs and occurs when it reacts with particles suspended in the air. In cold weather, temperature inversion can trap emission at ground level.
- 45 A Local Authority (LA) is required to assess its area for exceedances of specific pollutants as defined in law. Where air quality is found (through monitoring or modelling) to exceed the required legal levels, a LA is then is required to "declare" an Air Quality Management Area (AQMA) for the specific pollutant or pollutants.
- 46 Normally an AQMA only covers an area where a human is being exposed to poor air quality (in excess of the objective level) although some LAs have declared their entire districts as AQMA.
- 47 Sevenoaks District Council currently has nine (9) Air Quality Management Areas (AQMA). Each of these was declared between 2002 and 2014 and they are all associated with emissions from traffic on congested or busy roads.
- 48 Assessments undertaken by the District Council at the time of declaration identified exceedances in these areas of the following National Air Quality Objectives;
 - a. PM₁₀- These are small particles up to 10 microns in size. There are two appropriate legal standards:
 - i. 50ug/m³ (measured as a 24hr mean)- not to be exceeded more than 35 times per year
 - ii. 40ug/m³ (measured as an annual mean)
 - b. NO₂- Nitrogen Dioxide. There are two appropriate legal standards
 - i. 40ug/m³ (measured as an annual mean)
 - ii. 200ug/m³ not to be exceeded more than 18 times a year (measured as a 1-hour mean)

- 49 The AQMA cover the following areas which are declared for NO₂:
- a. M20- along the entire length from the boundary with Tonbridge & Malling Borough to Junction 3 of the M25
 - b. M25- from the county border with Surry to the district boundary with Dartford including junctions 3,4 ,5 and the extension of junction 5 to connect with the A25 at Bessels Green.
 - c. M26- from junction 5 of the M25 to the district boundary with Tonbridge & Malling Borough
 - d. A20- the Swanley Bypass from junction 3 of the M25 to the boundary with the London Borough of Bromley.
 - e. A25- along the entire length from the county border with Surry to the boundary with Tonbridge and Malling Borough.
 - f. A225 & A224- Sevenoaks town centre encompassing High Street and London Road
 - g. B2173- Swanley encompassing London Road, High Street, Bartholomew Way and parts of the town centre.
 - h. B2173- Swanley at the junction of London Road and Birchwood Road

And the following area declared for PM₁₀

- i) M25- Junction 5 to the border with Surrey
- 50 Each of these AQMA extend only a few meters from the associated road and are almost exclusively caused by vehicle emissions.
- 51 In addition to the pollutants above; concentrations of PM_{2.5} (particles less than 2.5 microns) are of significant concern. These particles can be readily absorbed into the lungs and be transported throughout the body. Whilst PM_{2.5} is emitted by vehicles (12.4% of total in atmosphere) the largest proportion is emitted by residential and small-scale commercial settings (43.1%).
- 52 PM_{2.5} is not directly monitored by the District Council and we do not have either a legal duty or the equipment to do so. Instead PM_{2.5} concentrations are extrapolated from national monitoring data and are presented in 1km squares. Within the UK (except Scotland) the National Objective is 25ug.m³ (measured as an annual mean) however the World Health Organisation considers that the acceptable standard should instead be 10ug/m³.
- 53 Owing to the methodology used to calculate PM_{2.5}, it only takes into account known sources and is unable to take into account of those that may be highly localised and affecting a small geographic area. As a consequence there is little variation in predicted PM_{2.5} concentrations year by year.
- 54 Unfortunately, a large proportion of the UK fails to comply with the WHO suggested standard of 10ug/m³ although the UK's standard (25ug/m³) is achieved nationally.

- 55 Concentration maps for Sevenoaks District show that the highest levels of PM_{2.5} (between 10-12ug/m³) are predicted to be found along the length of the M25, M26 and M20. Swanley, Farningham and New Ash Green are also predicted to have similar levels of PM_{2.5}. The remainder of Sevenoaks District is predicted to be affected by PM_{2.5} concentrations of between 5-10ug/m³.
- 56 PM_{2.5} is a highly mobile pollutant and can travel significant distances within the atmosphere. It is however apparent that the highest levels of PM_{2.5} are associated with more densely populated urban conurbations.
- 57 Within the Sevenoaks District, the primary source of PM_{2.5} is likely to be domestic combustion particularly that associated with solid fuel appliances (such as wood burners), open fires, uncontrolled fires (such as bonfires), and in some specific areas construction and quarrying.
- 58 Although Local Authorities are not required to monitor PM_{2.5}, we do have a duty to work towards reducing their emissions as part of our overall work to improve air quality.

Air Quality Monitoring within Sevenoaks District

- 59 The District Council has two Automatic Air Quality Monitoring Stations (AQMS) located at the Bat and Ball junction on the A25 and at Greatness Park.
- 60 The Bat & Ball AQMS is located adjacent to the road (roadside analyser) and was situated to measure emissions in the vicinity of the busy junction. This analyser is able to measure PM₁₀ and NO₂ on a minute by minute basis.
- 61 The Greatness AQMS is located on the edge of Greatness Park and was situated to measure background concentrations of pollution. This analyser is able to measure PM₁₀, NO₂ and O₃ (Ozone) on a minute by minute basis.
- 62 All of the air quality monitoring data collected by our AQMS is automatically uploaded to the London Air Quality Network and is available to residents via the following link:
<https://www.londonair.org.uk/london/asp/publicdetails.asp>
- 63 In addition to our two AQMS, the District Council maintains a network of 49 diffusion tubes which are sited in areas of predicted poor air quality. These diffusion tubes contain a small metal mesh which is impregnated with a chemical which reacts to NO₂. Each diffusion tube is exposed for one month before being sent for analysis.
- 64 Each year, we are able to analyse the monthly diffusion tube results to calculate compliance with the National Objective level (40ug/m³).

Other options Considered and/or rejected

That the District Council continue to maintain all of the AQMA throughout Sevenoaks District.

That Officers identify/ develop a shortlist of actions and measures to improve Air Quality which would be presented to Committee for discussion and selection

That the District Council continues to purchase access to the Air Alert scheme with funding to be derived from existing budgets.

That the District Council consider developing an alternative scheme to 'Air Alert' which would allow officers greater control of its content and messaging. This would allow us to continually improve the service and messaging could be expanded to other areas of public health information, or council messaging.

That officers will, following scenario testing, provided a report on recommended/ proposed Air Quality Actions to Cabinet for consideration and decision.

Key Implications

Financial

Nil- costs of developing the Air Quality Action Plan are already accounted for within service budgets

Legal Implications and Risk Assessment Statement.

The District Council has a legal obligation to develop and deliver an Air Quality Action plan which identifies appropriate measures to improve Air Quality within an AQMA.

Where a proposed development is likely to impact upon air quality within an AQMA, there may be enhanced grounds to require mitigation or health protection measures from the developer.

The District Council cannot revoke an AQMA without agreement from DEFRA.

The District Council also has a legal duty to report air quality monitoring data on an annual basis to DEFRA within an Air Quality Status Report.

The District Council is acting lawfully within the provisions of the relevant legislation.

Equality Assessment

Members are reminded of the requirement, under the Public Sector Equality Duty (section 149 of the Equality Act 2010) to have due regard to (i) eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Equality Act 2010, (ii) advance equality of opportunity between people from different groups, and (iii) foster good relations between people from different groups. The decisions recommended through this paper directly impact on end

users. The impact has been analysed and varies between groups of people. The results of this analysis are set out immediately below.

There are 161 users of the Air Alert System text messaging system. Owing to its targeted audience a large proportion of these are likely to be individuals with pre-existing respiratory health conditions (i.e. asthma, COPD etc). The District Council has seen a decline in the number of subscriptions to the service since its inception in 2011 and it is unclear how many of the 161 'users' remain active. Additionally users can download the Air Alert mobile application. The District Council does not have any data to quantify the usage of this application.

There are now multiple sources of information which predict poor air quality within the district including a forecast that is published on the DEFRA website. It is therefore considered that there is unlikely to be a significant impact from the District Council withdrawing from this service and we are able to signpost to alternate sources of the information.

Net Zero

The proposals within this report are likely to have a complimentary effect on the District Council's efforts to achieve Net Zero

Appendices

Appendix A - Report from Bureau Veritas- Sevenoaks District Council Detailed Assessment of Existing AQMA

Appendix B - 2020 Air Quality Annual Status Report

Background Papers

None

Richard Morris

Deputy Chief Executive and Chief Officer - Planning & Regulatory Services