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Title of meeting: Environmental Services Portfolio Decision Meeting

Subject: The 2023 Annual Status Report of Air Quality

Date of meeting: 14th December 2023

Report by: Richard Lee, Assistant Director Culture, Leisure, and Regulatory Services

Wards affected: All

1. Requested by Councillor Dave Ashmore, Cabinet Member for Environmental Services

2. Purpose

2.1 To provide the relevant Portfolio Holder information on the Local Air Quality Management (LAQM) process and recent Review and Assessment (R&A) of air quality (AQ) in Portsmouth through the publication of the 2023 Annual Status Report (ASR).

3. Information Requested

3.1 Through the LAQM system relevant local authorities must assess air quality in their area against air quality objectives and submit an ASR to His Majesty's Government (HMG). The 2023 ASR reports upon the 2022 data set.

3.2 The formal submission deadline of Portsmouth City Council's (the council) 2023 ASR to Department for Environment Food and Rural Affairs (Defra) was 30th June 2023. DEFRA had been advised of our delay in submitting this document which was uploaded to their platform on the 30th November 2023.

3.3 Whilst the 2022 ASR was comprehensive, as a result of Defra's assessment of such, additional information had been requested to be contained with the 2023 ASR. These recommendations were actioned / included. The majority of this information related to how the data was presented and not the data itself or the method it was collected and verified. Consequently the 2023 has expanded to over 350 pages. This report highlights the most relevant data sets and trends in pollutant levels contained within the 2023 ASR.

4. An introduction to our sampling network

4.1 The council has frequently revised its non-automatic monitoring of NO₂ network via Nitrogen Dioxide Diffusion Tubes (NDDT) expanding it in 2021 to reach 233 sites as a



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result of the additional monitoring requirements of the council's Clean Air Zone (CAZ). This number of sites is also reported within the 2023 ASR and is considered to provide a robust data set in respect to our monitoring and the pollution levels during 2022. The historical expansion of the NDDT monitoring network* is set out below:

- 27 sites prior to 2017.
- 76 additional monitoring sites were deployed in the period 2017-2018 (103 sites in total).
- 41 additional monitoring sites were deployed in 2019 (144 sites in total).
- 17 additional monitoring sites were deployed in 2020 (161 sites in total).
- 72 additional monitoring sites were deployed 2021 to specifically assess the performance of the CAZ (233 sites in total).

* The number of locations may have been subject to change during each year.

4.2 An expansion of the Continuous Air Quality Monitoring Station (CAQMS) network occurred in late 2020, increasing the council's network from four to five CAQMSs. The additional station was installed in Alfred Road to further assess the impact of the CAZ. The first comprehensive year of sampling data from this station occurred in 2022.

4.3 The impact of the increasing demands for data upon the existing staffing resource of 1 FTE created significant problems in respect to mandatory reporting during 2021/2022. This resourcing issue has been carefully considered and additional funding has now been provided to Regulatory Services (RS) to secure additional personnel to maintain the existing R&A requirements and the further reporting needs which have arisen as a result of the CAZ. It is therefore anticipated that the council will continue to be better placed to meet the requirements of Defra, both in relation to the ASR reporting process, and reporting the performance of the CAZ, moving forward.

4.4 Whilst the reporting of data had previously been significantly impacted as a result of the increased need for such, the council has acquired and retained all the necessary data as required by Defra therefore maintaining its mandatory reporting requirements.

5. What is the 2022 data telling us?

5.1 With respect to Nitrogen Dioxide (NO₂) annual mean, covering 227 NDDT monitoring locations for the last two years, the levels were in excess of the National Air Quality Objectives (NAQO) at four locations.

5.2 Two of these locations were in excess of the NO₂ annual mean NAQO in 2021. These are located along the road links, as identified by Defra as significant areas of concern and are now areas subject to the CAZ:

- Alfred Road, south / west of AQMA11: **Alfred Road, 48.54 µg/m³ (AR-Col 9)** and **Alfred Road, 45.89 µg/m³ (AR-Col12)**.



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- Hope Street south / west of AQMA11: **Hope Street, 44.88 µg/m³ (HR-opp-Column4).**
- The fourth monitoring location in excess of NO₂ annual mean NAQO is located on the south / west of AQMA11 on Market Way that is an extension of Alfred Road to the East: **Market Way, 48.47 µg/m³ (MW-OppStABS).**
- In addition to the above, the 2022 NO₂ annual mean increased from 2021 to 2022 to reach 40 µg/m³. This site is located in AQMA6 outside the geographical boundary of the CAZ: **Kingston Road, 40 µg/m³ (KR-Col4).**

5.3 A summary of annual mean concentrations as recorded by the network is as follows:

- NO₂ annual mean increased between 2021 and 2022 at 113 out of 227 locations (49.78%).
- NO₂ annual mean decreased between 2021 and 2022 at 114 out of 227 locations (50.22%).
- In the long-term, NO₂ annual mean trends for the last five years (2018-2022) exhibited downward trend at 119 out of 155 locations (76.77%) and exhibited upward trend at 36 out of 155 locations (23.23%) for the same period.

5.4 A further assessment of NDDT results within and in the immediate vicinity of the existing five Quality Management Areas (AQMA) in the short term (between 2021 and 2022) and long-term (period between 2018 -2022) concluded the following:

- **AQMA 6:** LAQ worsened within AQMA 6 in the long-term and improved in the short term. However, LAQ improved in the vicinity of AQMA 6 in the long-term and in the short term.
- **AQMA 7:** LAQ improved within and in the vicinity of AQMA 7 in the long-term. However, LAQ worsened within and in the vicinity of AQMA 7 in the short-term.
- **AQMA 9:** LAQ improved within and in the vicinity of AQMA 9 in the long-term. However, LAQ improved within and in the vicinity of AQMA 9 in the short term.
- **AQMA 11:** LAQ improved within and in the vicinity of AQMA 11 in the long-term, However, LAQ worsened within and in the vicinity of AQMA 11 in the short term.
- **AQMA 12:** LAQ improved within AQMA 12 in the long-term. However, LAQ worsened within AQMA 12 in the short term.



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5.5 With respect to NDDT NO₂ 1-hour mean values, none of CAQMS NO₂ annual mean exceeded 60µg/m³ which indicates that an exceedance of the NO₂ 1-hour mean NAQO is highly unlikely.

5.6 The 2022 NO₂ annual mean level increased across 3 out of five CAQMSs (60%), however, still met the NO₂ annual mean NAQO at all long-term CAQMSs. These changes are considered as adverse with variable degrees. However, an overall long-term AQ improvement over the last five years was still exhibited.

5.7 A breach of NO₂ annual mean was registered at the council's newly established 5th CAQMS at Alfred Road 43.45 µg/m³.

5.8 The annual means at each CAQMS are confirmed below:

- London Road, 32.08 µg/m³, **Adverse, Upward No Exceedance**
- AURN, 14.87 µg/m³, **Beneficial Downward No Exceedance**
- Burrfields Road, 27.07 µg/m³, **Adverse Upward No Exceedance**
- Mile End Road, 26.73 µg/m³, **Beneficial Downward No Exceedance**
- Defra, 23.31 µg/m³, **Adverse Upward No Exceedance**
- Alfred Road, **43.45 µg/m³, Exceedance**

5.9 There has been no exceedance of the PM₁₀ annual mean NAQO since 2018 at any of Portsmouth based CAQMSs. The highest registered PM₁₀ annual mean since then was recorded in 2018 at PCC's Burrfields Road roadside CAQMS (21.69µg/m³). The highest PM₁₀ annual mean recorded in 2022 was 19.27µg/m³ at Defra's CAQMS located at Anglesea Road.

5.10 In the long-term, PM₁₀ annual means are decreasing across all the council's and Defra's owned CAQMSs, except for the AURN Gatcombe Park CAQMS since 2018. In the short-term, PM₁₀ annual mean increased across all Portsmouth based CAQMS in the, except for Mile End Road CAQMS where the PM₁₀ annual mean decreased by 0.45 µg/m³.

5.11 The 2022 PM₁₀ monitoring concluded the following:

- London Road, 17.39 µg/m³, **Adverse Downward No Exceedance**
- AURN, 15.7 µg/m³, **Adverse Upward No Exceedance**



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- Burrfield Road, 16.12 $\mu\text{g}/\text{m}^3$, **Adverse** **Downward** **No Exceedance**
- Mile End Road, 14.04 $\mu\text{g}/\text{m}^3$, **Beneficial** **Downward** **No Exceedance**
- Angelsea Road, 19.27 $\mu\text{g}/\text{m}^3$, **Adverse** **Downward** **No Exceedance**
- Alfred Road, 17.68 $\mu\text{g}/\text{m}^3$, **No Exceedance**

5.12 There were four occurrences in 2022 at Alfred Road CAQMS where the PM_{10} 24-hour mean was in excess of $50\mu\text{g}/\text{m}^3$. This does not amount to an exceedance on PM_{10} 24-hour mean NAQO. The highest number of PM_{10} 24-hour mean in excess of $50\mu\text{g}/\text{m}^3$ in the last five years (2018-2022) reached five occurrences in 2018 at London Road and Mile End Road CAQMSs. This does not amount to an exceedance of the PM_{10} 24-hour Mean NAQO.

5.13 The Council monitors $\text{PM}_{2.5}$ at London Road, Gatcombe Park AURN), Burrfields Road, Mile End Road and Alfred Road CAQMSs. In 2022 $\text{PM}_{2.5}$ the highest $\text{PM}_{2.5}$ Annual Mean level ($10.47\mu\text{g}/\text{m}^3$) being recorded at London Road CAQMS.

5.14 In the short-term, the 2022 $\text{PM}_{2.5}$ annual mean:

- decreased at London Road and Mile End Road resulting in short-term AQ amelioration.
- increased at Gatcombe Park and Burrfields Road CAQMS resulting in short-term AQ deterioration.

5.15 In the long-term the 2022 $\text{PM}_{2.5}$ annual mean exhibited a downward trend cross London Road, Gatcombe Park AURN), Burrfields Road, Mile End Road CAQMSs resulting in a long-term AQ improvement.

5.16 Historically, the highest $\text{PM}_{2.5}$ annual mean recorded in Portsmouth was $14.26\mu\text{g}/\text{m}^3$ in 2014 at the AURN CAQMS. This level dropped in 2018 to $12.32\mu\text{g}/\text{m}^3$, decreased further in 2019 to $8.9\mu\text{g}/\text{m}^3$ and then started to increase since to reach $10.47\mu\text{g}/\text{m}^3$ in 2022.

5.17 The 2022 $\text{PM}_{2.5}$ monitoring concluded:

- London Road, $10.47\mu\text{g}/\text{m}^3$ **Beneficial** **Downward**
- AURN, $9.26\mu\text{g}/\text{m}^3$ **Adverse** **Downward**
- Burrfields Road, $9.85\mu\text{g}/\text{m}^3$, **Adverse**
- Mile End Road, $8.32\mu\text{g}/\text{m}^3$, **Beneficial** **Downward**



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- Alfred Road, 9.83 $\mu\text{g}/\text{m}^3$.

6. Non-technical summary - a one minute guide

6.1 It is difficult to summarise a year's worth of data across hundreds of monitoring locations and three different pollutants. When doing so it is important to recognise the significant public health implications that are created as a result to poor air quality and that the council is working hard to continue to further reduce levels of pollutant within the city.

6.2 The work of RS is to create a robust data set which will assist others in making important decisions in respect to health and the causes of pollution. RS immediate work concentrates around the NAQO and the council's compliance with such. Therefore, when attempting to summarise the data within this report and the 2023 ASR with reference to the 2022 data set it may be possible to do so as follows:

- With respect to nitrogen dioxide levels across our monitoring network, six results in four separate locations exceed (or are equal to) the NAQO. These are shown through five NDDT and one CAQMS. The focus of these areas are within the geographical extent of the CAZ and are concentrated around the road links which are subject to the government's primary attention - i.e., Alfred Way and Hope Street. One of these exceedances (that equal to the NAQO) sits outside the CAZ within Kingston Crescent.
- With respect to particulate matter (both of PM_{10} and $\text{PM}_{2.5}$) levels are significantly below those stipulated within the NAQO or the current target concentrations for such.

6.3 The level of nitrogen dioxide therefore remains the primary concern of the council in respect to compliance with the NAQO.

6.4 The 2022 data in its entirety, its relevance to public health, and necessary actions to improve air quality, will continue to be discussed with our partners within those functions of the council together with external interested parties who need to have high regard to this data and the pollution trend lines formulated (where they exist) over a period of years.

7. Conclusions

7.1 It is not always possible to categorically state why the NO_2 , $\text{PM}_{2.5}$ and PM_{10} levels changed in 2022, given that a multitude of factors influence pollutant generation and their subsequent dispersion.

7.2 It should however be noted that, as a result of the impact of the Covid-19 pandemic, levels of pollution fell uncharacteristically in 2020 and therefore it may not be unexpected that increases in NO_2 occurred in 2021 and 2022 as traffic levels returned gradually to pre-pandemic levels when compared with the levels recorded in 2020. Therefore, a collation



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between levels of NO₂ increasing between 2020 and 2022 as a consequence of other contributory factors such as the Covid-19 pandemic is more than likely and should be taken into consideration when considering the data within this report.

7.3 A copy of the 2023 ASR is available on request from:
cleanerair@portsmouthcc.gov.uk.

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Signed by Richard Lee, Assistant Director Culture, Leisure, and Regulatory Services

Appendices: None

Background list of documents: Section 100D of the Local Government Act 1972

The following documents disclose facts or matters, which have been relied upon to a material extent by the author in preparing this report:

Title of document	Location
LAQM Technical Guidance (TG16)	Technical Guidance LAQM.TG(16) Online Viewer - Defra, UK
Locations of Portsmouth AQMAs	Local Authority Details - Defra, UK
Drive in a clean air zone	Drive in a clean air zone - GOV.UK (www.gov.uk)
UK National Air Quality Limits	UK Air Quality Limits - Defra, UK