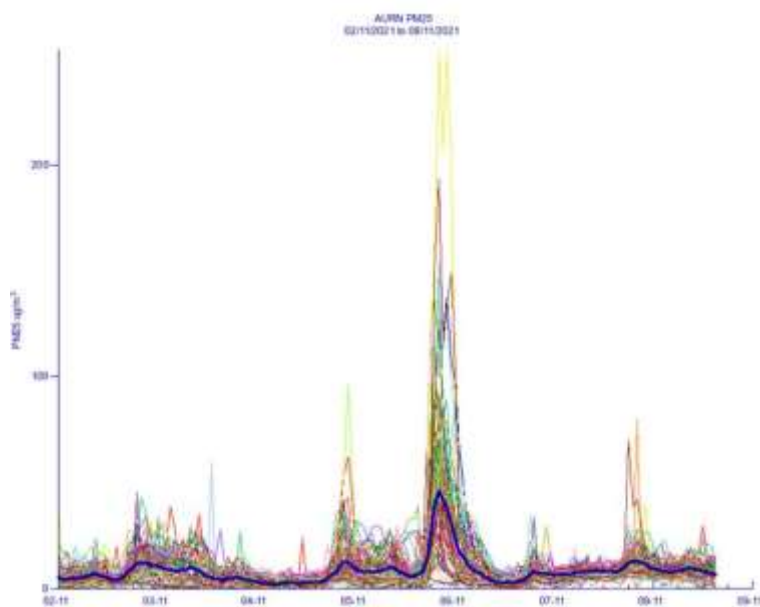


## Ricardo's Bonfire Night and Diwali Air Quality Analysis 2021

There are hourly mean peak measured concentrations for PM<sub>2.5</sub> across the UK between 4<sup>th</sup>-7<sup>th</sup> November which coincide with events related to Diwali and Bonfire Night. The largest peaks occurring between 8-10 pm on 5<sup>th</sup> November (**Figure 1**). PM<sub>10</sub> and PM<sub>2.5</sub> concentrations at some measurement locations in South Wales and Southeast England exceeded 75 µg.m<sup>-3</sup> (**Figure 2**),<sup>1</sup> and the DAQI (Daily Air Quality Index <https://uk-air.defra.gov.uk/air-pollution/daq>) was 'moderate' and 'high', respectively, in these regions (**Figure 3**). The DAQI is calculated from daily mean concentrations of PM<sub>10</sub> and PM<sub>2.5</sub>, peaks in concentration spanning a few hours can increase the daily mean and lead to a higher DAQI banding for the day. Proximity of bonfires and fireworks in relation to the monitoring locations can also affect the measurements.

There was less of an impact from Bonfire Night overall in 2021 compared to previous years, as the dispersion of PM relies on weather conditions. This year, conditions were predominantly calm and settled, particularly in southern England and southern Wales, with some parts of the country experiencing wet weather and gentle to moderate, westerly winds (for example, in Scotland and Northern England).<sup>2</sup> Although Bonfire Night events were reduced in number and size because of COVID-19 restrictions in 2020 and 2021, higher particulate concentrations were recorded in 2020, likely to be caused by a settled, high pressure system preventing the dispersion of PM.<sup>3</sup> In 2019, there were localised particulate pollution events around London and North-western England related to Bonfire Night events<sup>4</sup>, but most parts of the country experienced moderate winds and unsettled conditions.

Although there were still PM peaks over a few hours on the days around Bonfire Night, the reduction in the number and size of events and weather conditions lead to less of an impact from Bonfire Night events on PM pollution in 2021 than in previous years.



**Figure 1 – Hourly mean PM<sub>2.5</sub> concentrations across the AURN network during November**

<sup>1</sup> [https://uk-air.defra.gov.uk/data/data\\_selector](https://uk-air.defra.gov.uk/data/data_selector)

<sup>2</sup> <https://www.metoffice.gov.uk/>

<sup>3</sup> UK Annual Report 2020, [https://uk-air.defra.gov.uk/library/annualreport/viewonline?year=2020\\_issue\\_1&jump=6-6#report\\_pdf](https://uk-air.defra.gov.uk/library/annualreport/viewonline?year=2020_issue_1&jump=6-6#report_pdf)

<sup>4</sup> UK Annual Report 2019, [https://uk-air.defra.gov.uk/library/annualreport/viewonline?year=2019\\_issue\\_1&jump=6#report\\_pdf](https://uk-air.defra.gov.uk/library/annualreport/viewonline?year=2019_issue_1&jump=6#report_pdf)

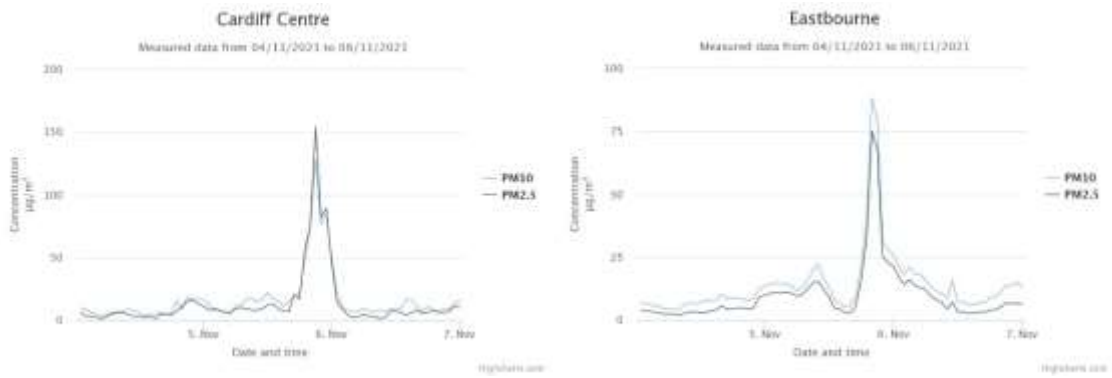


Figure 2 – Example PM peaks in South Wales and Southeast England on 5<sup>th</sup> November



Figure 3 – The UK DAQI for 5/11/21<sup>5</sup>

<sup>5</sup> <https://uk-air.defra.gov.uk/>