Further Notes and Concerns Regarding Facility PAH Emissions (Poly-cyclic and/or Poly-nuclear Aromatic Hydrocarbons)

Submitted to the 11 July 2023 SCAQMD Working Group Meeting #4 on Rule 1180 Expansion
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Note 1: The SCAQMD Staff noted in their Working Group Meeting #1 that their present rules and procedures require updating their Board on technology progress once every 5 years. Citizen noted that, as a matter of Public Health and Safety, that progress and updates on PAH assessment should be done more often, and SCAQMD Staff verbally agreed to do a yearly PAH update assessment to their Board. This SCAQMD commitment should be explicitly captured in these Working-Groups Meeting charts.

Note 2: As Citizen has previously noted (Citizen communication to SCAQMD Staff circa 4/19/2023), Rule 1180 already has Fenceline Point-Monitors (FPM) for Black Carbon (BC) as a near-real-time (one datum every 5 minutes) alternative to the optical 'Real-Time Path Monitoring', which primarily interrogates gaseous molecules. As p. 27 of the present Working Group #4 SCQMD presentation notes: "No real-time monitoring technologies currently available for PAHs, other than Naphthalene". Citizen notes that even if the 'holy grail' of an optically-based gas-phase "real-time monitoring technologies" were available for PAHs, it would be incomplete, and it would underestimate net PAH emissions, since many of the PAH molecules that are emitted by facilities are attached to PM (Particulate Matter), which would not be detected by the optically-based methods, due to the PAH surface bonding.

Note 3: The SCAQMD has two particle size points: PM-10 for airborne particulate matter of diameter 10 um or smaller, and PM-2.5 for airborne particulate matter of diameter 2.5 um or smaller. The attached graphic shows that it was even known in the late 1970's that a significant amount of airborne PAH's resides on particulate matter. Those historical Pasadena, CA data show that more than 50% of the PAH mass on particles using a PM-4.0 standard actually reside in the PM-0.12 category, meaning that the PAH is captured on particles 20X smaller than the PM-2.5 limit. These data show that the SCAQMD needs to work harder to establish at least a Near-Real-Time Interim Monitor (NRT-IM) for PAH, such as by using an intermittent PAH assay of already collected Black Carbon (BC) specimens.

Note 4: The intermittent assay of BC specimens for PAH content could then be used as calibration to estimate the PAH content of all the other collected BC specimens between these PAH assessment points. Those same BC samples could also be used as an alternative assay for Cd, Mn, and Ni, to complement any real-time or near-real-time XRF (X-Ray Fluorescence) measurements that the SCAQMD is presently considering.

Note 5: Page 20 of 54 of the SCAQMD Working-Group Presentation #4 notes that the highest 1-hour averaged VOC emission for a facility during one quarter in 2022 was as low as 230 ppb. That value establishes a facility baseline estimate for what 'normal operation' is. Unfortunately, that same facility must have had 'non-routine' operations during another 2022 quarter, where it's highest 1-hour averaged VOC emission was 15,000 ppb, with the next quarter showing a similar event at 14,000 ppb, both exceeding the 230 ppb baseline by over **50X**. These data highlight that much of the ongoing community risk from these facilites may be due to short but intense periods of 'non-routine' operation. Citizen expects the same will be true for facility net PAH emissions, when PAHs on BC are included.

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DISTRIBUTION OF POLYCYCLIC AROMATIC HYDROCARBONS WITH RESPECT TO PARTICLE SIZE IN PASADENA AEROSOLS IN THE SUBMICROMETER RANGE

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