



MEMORANDUM

TO: Climate, Energy, and Environment Policy Committee (CEEPC)
Metropolitan Washington Air Quality Committee (MWAQC)
FROM: Air and Climate Public Advisory Committee (ACPAC)
SUBJECT: Air Quality Monitoring in the Metropolitan Washington Region
DATE: October 9, 2026

Background

At the July 20, 2026 Air and Climate Public Advisory Committee (ACPAC) meeting, COG Staff Sunil Kumar presented an Ozone Season Summary. The presentation showed that air quality data trends indicate significant progress in reducing exceedances of pollution standards since the late 1990s. However, recent air quality issues stem from Canada's wildfire and July 4 fireworks, impacting PM2.5 levels significantly. In 2026, PM2.5 exceedance trend showed four exceedances:

- Orange: July 4-5
- Purple: July 17
- Red: July 18

The July 4 fireworks in the District of Columbia were among the largest displays in the region and the smoke from Canada's wildfires were shown to cause code purple levels on July 17 and code red levels on July 18. ACPAC members discussed the limitations of PM2.5 monitoring in assessing local air quality trends and recommended expanding and enhancing the air quality monitoring network to address data gaps and improve future analyses.

Discussion and Recommendations

Current efforts to monitor and analyze the region's changing airborne pollution leave significant room for improvement. Expanded monitoring focused on localized impacts would improve public understanding of the health and environmental effects of PM2.5 pollution and ultrafine particulate matter at the community level.¹

Recommendation 1: Conduct analysis and projection of past and future impacts of data center backup generators on local air quality, in light of PJM's recent requests for federal emergency orders and other unexpected drivers of potential backup generator use.

¹ <https://pubmed.ncbi.nlm.nih.gov/40079183/>

Backup generators at data centers are not subject to the same level of air pollution regulations as power plants and industrial facilities since they are intended to be used during emergencies rather than on a frequent basis. That means that backup generators could have an outsized impact on local and regional air quality if they are operated more frequently than expected, especially given that the data centers in our region mostly use dirty Tier 2 diesel generators.

A recent development is that PJM, has been requesting and receiving authorization from the U.S. Department of Energy (USDOE) to require data center operators to run their facilities on backup generation at times of peak load on the energy grid such as during extreme heat waves. According to USDOE's Federal Emergency Order Section 202(c) of the Federal Power Act², this occurred several times in 2026, including in mid-May and late June/early July. What is especially concerning about these emergency orders is that *they could override any environmental regulations*, whether at the federal, state, or local level. Being an option that PJM has only pursued since a letter³ was sent from the Secretary of Energy to reliability coordinators and balancing authorities on January 22, 2026, more work is needed to assess the impacts of these emergency actions on local air pollution both this year and in the future.

In addition, PJM has a demand response program, to which data centers can opt in, that allows the operation of backup generators as a measure for reducing grid electricity demand. This resulted in diesel generators running in Northern Virginia during a Pre-Emergency Load Management Reduction action in June 2025⁴. Data center backup generators may not be used for demand response in Maryland though.

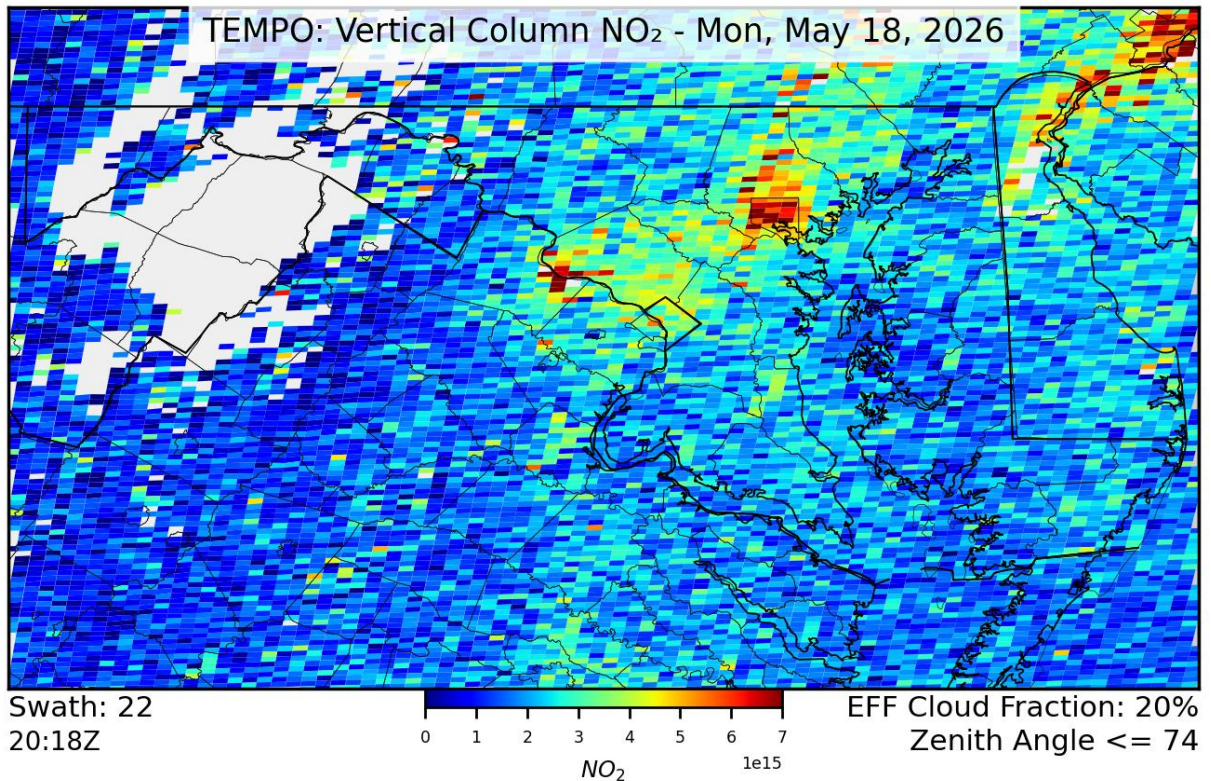
Satellite observations provide possible evidence that data center backup generators were employed and caused significant pollution during one or more of these emergency periods. For example, examination of data from NASA's TEMPO satellite instrument reveals a hotspot of nitrogen dioxide (NO₂) in the middle of Loudoun County on May 18,⁵ one of the days for which PJM received authorization from the USDOE to rely on backup generators (see graphic below). According to the Air Quality Monitoring Program in the Maryland Department of the Environment (MDE), although they have not been able to confirm that the backup generators were actually running on that day, they are not sure what else could have caused the very prominent NO₂ signal other than the preponderance of data centers in that area. It would be interesting to see whether the Virginia DEQ's data center air quality monitoring project captured any unusually high pollutant levels during the emergency periods and what impacts they may have on air quality in nearby communities and across the MWCOG region.

² <https://www.energy.gov/ceser/2026-doe-202c-orders>

³ <https://www.energy.gov/documents/leveraging-backup-generation-facilities-during-energy-emergencies>

⁴ <https://emergencyprocedures.pjm.com/ep/pages/viewposting.jsf?id=104655>

⁵ This was only two days before the May 20, 2026 MWAQC meeting, which could explain why the unusually high NO₂ was not brought up during the presentation by the Virginia DEQ on their newly launched data center air quality monitoring project.



(Graphic courtesy of MDE Air Monitoring group, based on NASA's TEMPO Near Real-Time NO₂ data product)

Recommendation 2: Broaden the analysis to assess finer particles like black carbon.

- PM2.5 monitoring does not analyze exposures occurring in smaller geographic areas and over time-limited periods.
- Black carbon monitoring is better at monitoring those trends.

In the 2024 Virginia Joint Legislative Audit and Review Commission (JLARC) report⁶ on data centers, the Virginia Department of Environmental Quality (VADEQ) stated that “air quality monitoring occurs regionally and does not effectively capture localized effects”. Given the high concentration of diesel generators for backup purposes, and the erosion of the definition of emergency use, more study of localized air quality impacts is needed in Northern Virginia, and likely other areas with similarly concentrated fossil fuel-based energy generation.

⁶ <https://jlarc.virginia.gov/pdfs/reports/Rpt598.pdf>

Recommendation 3: Consider the use of ultrafine particulate sensors to detect ultra-fine particulates (UFPs).

Ultra-fine particles are an under-measured type of particulate pollution. Particles of that size can pass into the brain through the olfactory pathways and cause cognitive diseases such as Alzheimer's Disease (AD)⁷.

Currently neither the EPA nor VADEQ is measuring UFPs in Virginia. Detection hardware is available, though at a significant financial cost, roughly \$15k per monitoring station. Cost would be further increased by the short dropoff distance (around 1,000 meters) of UFPs.

There are additional benefits to instituting this type of monitoring. Local geographic variation in exposure to air pollutants is not well captured by conventional monitoring techniques. This lessens our ability to communicate effectively to the public about what their real risks may be. For example, people living near high traffic corridors may experience higher risks from exposure to traffic related pollutants (and components of that exposure are attributed to diesel fuel burning vehicles).

Conclusion

ACPAC suggests that MWCOG and/or the MWAQC assess the potential impacts of data center backup generator use on local and regional air quality. There are worrisome indications that the backup generators may be used more frequently than previously anticipated. Also, it would be beneficial to have an assessment by MWCOG and/or the MWAQC of the current UFP and black carbon monitoring systems and research projects across the MWCOG jurisdictions, and how gaps in the monitoring could be addressed to provide more information on local and hyper-local exposures. We request a briefing and summary documentation and would be happy to provide further comments and suggestions.

Additional Resources

- [Heat Wave Prompts Increased Data Center Generator Use; Turner Pushes for Tier 4 Upgrades, July 2025](#)
- [PJM Filings & Orders](#)
- [October 3-5, 2026 PJM Post Contingency Local Load Relief Warning](#)
- [Transcriptomic Alterations in the Olfactory Bulb Induced by Exposure to Air Pollution: Identification of Potential Biomarkers and Insights into Olfactory System Function](#)

⁷ <https://pubmed.ncbi.nlm.nih.gov/40079183/>