



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF INSPECTOR GENERAL  
OFFICE OF INVESTIGATIONS

February 18, 2022

**MEMORANDUM**

**SUBJECT:** Management Implication Report Concerning Inappropriate Manipulation of Air Filter Data by Office of Research and Development Contractor

**FROM:** Marc Perez, Acting Assistant Inspector General  
Office of Investigations

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Perez

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**TO:** John Steenbock, Director  
Office of Resource Management  
Office of Research and Development

**Purpose:** The U.S. Environmental Protection Agency's Office of Inspector General confirmed that an Office of Research and Development laboratory contractor's inappropriate manipulation of air filter data and failure to follow applicable EPA and project guidance resulted in data for 95 air filter samples, which supported the PM<sub>2.5</sub> Air Monitoring Network, being rendered unusable.<sup>1</sup> An EPA Office of Air Quality Planning and Standards audit concluded that the air filter data "cannot be used due to data quality and integrity issues."

**Background:** Particulate matter monitoring networks, including the PM<sub>2.5</sub> Air Monitoring Network, collect ambient air data. Using performance evaluation samples, the ORD assesses the quality of the data that these networks collect as part of the EPA's responsibility to ensure the reliability of ambient air data. As part of the quality assurance process, an ORD contractor located in Research Triangle Park, North Carolina, was tasked with analyzing PM<sub>2.5</sub> air filter samples. The impacted PM<sub>2.5</sub> air filter samples were prepared at the EPA Research Triangle Park laboratory. After noting concerns as to both the substance and the format of air filter data that was submitted by the contractor, an EPA project manager requested an audit from OAQPS. The audit was conducted in May 2019. The *Summary of OAQPS Audit Findings* made the following determinations and conclusions:

- The contractor failed to use the Excel spreadsheet provided by the EPA for the required data analysis and instead created a new spreadsheet that did not present the data in the requested format.
- A subset of filters weighed by the contractor in November 2018 was "misidentified" by the contractor during either the loading process in the automated weighing system or by the manner of recording the weight of the filters after they were weighed.

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<sup>1</sup> PM<sub>2.5</sub> means particulate matter of less than 2.5 microns in size.

- The contractor failed to do a timely quality assurance check after initially weighing the air filters, so the contractor did not discover the initial misidentification error until February 2019.
- Instead of notifying the EPA of the initial misidentification, the contractor manipulated the data by substituting the data with data from other weigh sessions and improperly arranged the data, so the results appeared valid.

As a result of the audit findings, OAQPS determined that the air filter sample data collected by the contractor “cannot be used due to data quality and integrity issues.” OAQPS also requested ORD quality assurance personnel conduct an independent audit of the data. According to the OAQPS audit, the ORD conducted two audits that produced similar findings to those identified above.

**Concerns Identified:** In December 2019, the OIG received an allegation concerning this matter. As part of its investigation, the OIG interviewed EPA and contractor personnel, as well as reviewed the OAQPS and ORD audit findings. The OIG investigation supported the findings and conclusions of the OAQPS audit, including that the ORD contractor made mistakes in the original weighing of the data and inappropriately manipulated the data in an attempt to make the data appear valid. The investigation also supported the finding that the contractor did not consistently use the Excel spreadsheet provided by the EPA to report the PM<sub>2.5</sub> performance evaluation air filter data. Had the contractor used that spreadsheet instead of creating another spreadsheet, the contractor may have realized the mistake in the original weighing of the data, which in turn may have allowed a timely reweighing of the air filter samples.

Additionally, the contractor’s conduct in weighing the air filter samples failed to adhere to the project’s *Sample & Analysis Plan, Air Quality Monitoring: Mega Performance Evaluation (Mega PE) and PM<sub>2.5</sub> Round Robin Program Sampling, Gravimetric Analysis, and PE Sample Distribution*, dated June 27, 2018, referred to as the *Sampling Plan*. The contractor also failed to adhere to the EPA’s *Quality Assurance Document 2.12, Monitoring PM<sub>2.5</sub> in Ambient Air Using Designated Reference or Class I Equivalent Methods*, dated January 2016, referred to as the *Quality Assurance Guide*. Specifically:

- The contractor failed to keep a laboratory notebook as provided in the *Sampling Plan* and the *Quality Assurance Guidance*. Keeping a lab notebook is a recognized professional laboratory practice. If the contractor had done so, details which should have been contemporaneously recorded in the lab notebook may have aided in correcting the misidentified data.
- The contractor failed to review the PM<sub>2.5</sub> air filter weight data within 24 to 48 hours after the initial weighing of the filters, as specified in the *Sampling Plan*. If the data had been timely reviewed, the discrepancies may have been identified in time for the air filters to have been reweighed and data would not have been lost. Instead, by waiting several months after the initial weighing to identify the errors, it was too late to reweigh the air filter samples because they exceeded the allowable holding time as provided in the *Quality Assurance Guidance*.
- The contractor failed to adhere to the method cited in the *Sampling Plan* that provided for measuring a balance check weight every ten samples in order to meet the acceptance limits of  $\pm 3.1$  micrograms of known mass criteria. In multiple analytical sequences of filter weighings performed in November and December 2018, the balance check weights did not meet the method criteria for 40 to 50 percent of the balance check weight measurements in the sequence. For example, in one analytical sequence, 22 out of 44 measurements of the balance check weight did not meet the method criteria.

- The contractor failed to keep an instrument maintenance logbook, as provided in the *Quality Assurance Guidance*. The automated balance that was used to weigh the air filters was not operating properly, which should have been recorded in a maintenance logbook. The contractor stated in an OIG interview that the contractor was not responsible for maintaining the balance. Even if that was the case, as an appropriate professional practice, the contractor should have notified either the contractor's management or the EPA that the balance was not operating properly, so repairs could have been made.

Finally, in addition to the concerns identified above with respect to the conduct of the contractor, the OIG was concerned with the contractor management's view of the analysis of the air filters. In particular, when interviewed about the contractor's performance, the contractor's management responded that "it was not a matter of us providing...a regulatory compliance...service for the EPA," which implied that the air filter review process was not important because the data review was not direct regulatory or compliance work. However, as noted in the *Sampling Plan*, "[t]he ambient data collected from [the particulate matter monitoring networks] drives regulatory decisions, and therefore, it is crucial to accurately assess the quality of data being collected."

My office is notifying you of the concerns identified above, so that the Agency may take whatever steps it deems appropriate. If you decide it is appropriate for your office to take or plan to take action to address these matters, the OIG would appreciate notification of that action. Should you have any questions regarding this report, please do not hesitate to contact Assistant Special Agent in Charge [REDACTED] or me at [REDACTED].

cc: Sean W. O'Donnell, Inspector General  
Jeffrey Prieto, General Counsel  
Joseph Goffman, Principal Deputy Assistant Administrator for Air and Radiation  
Richard Wayland, Director, Air Quality Assessment Division, Office of Air Quality Planning and Standards, Office of Air and Radiation