Reference Method Best Practices/Uncertainty Study

Background

Many EPA reference methods were developed 40+ years ago for pollutant concentrations many times higher than those typically found today. Small method biases that were insignificant 40 years ago when compared with measured emissions are very significant today with emissions levels sometimes one or two magnitudes lower. The Electric Power Research Institute (EPRI) realized this was the case with EPA Method 5 for filterable particulate matter. EPRI engaged CleanAir to survey best practices for applying Method 5 to very low-level particulate sources and to examine detection limit issues at these very low levels. The objective of this project was to improve the consistency and quality of filterable particulate data collected during stack tests.

CleanAir's Approach

To determine best practices for low-level particulate testing, CleanAir surveyed our own field personnel as well as those from other testing companies and compiled a list of factors that should be taken into consideration when conducting low-level Method 5 tests.

CleanAir also examined method biases, the significance of isokinetic sampling rate variation on collected particulate at various particle sizes, the effect of humidity on filter weights, and other potential bias issues.

Finally, CleanAir surveyed and reported previous studies estimating Method 5 precision and developed a comprehensive spreadsheet to estimate Method uncertainty at any desired grain loading.

Results

The EPRI guidance was made available to EPRI members and is now publically available at https://www.epri.com/#/pages/product/000000003002000975/

Summary

A survey of reference method best practices and detection limit issues for improving the quality of low-level pollutant concentration testing.

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