Introducing the report series on XRF QA/QC

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For IMPROVE samples collected since June 1992, CNL has used XRF for the analysis of elements above Fe. The analysis is performed with an energy-dispersive system designed and built here specifically for the 25 mm Teflon filters used in IMPROVE sampling. The system employs a Mo-anode source tube and a Si-Li detector, as documented in standard operating procedures ([SOP](SOP)).

Starting with samples collected in December 2001, CNL has also used XRF for the analysis of the lighter elements (Na-Fe). These analyses are performed with a similar system employing a Cu-anode source tube. The new system was introduced when the IMPROVE network was undergoing a rapid expansion that was straining operational and analytical capacities. After a period of initial testing, it was put into routine operation without a formal set of standard operating procedures.

Since the Cu-XRF system was introduced, modifications have been made from time to time in both the operating procedures and the system. For samples collected through 2004, these changes were not formally documented. The operation of the Mo-XRF system has also evolved since its SOP was last updated, in 1997. In recognition of the increasing regulatory use of IMPROVE data, CNL is now giving increased attention to documentation. An improved Cu-XRF system was introduced for the analysis of 2005 and later samples, and with it was launched this new series of quarterly reports.

In truly routine operations, "standard" procedures are both prescriptive and descriptive: they instruct operators what they are supposed to do, and simultaneously inform others what operators actually do. The initial XRF QA/QC reports are not yet prescriptive, instead documenting the physical systems and procedures in each quarter only after the fact. As is normal for non-commercial research measurements, systems and procedures may further evolve as experience is gained or conditions change in the future.