U.S. Environmental Protection Agency
Office of Inspector General

09-P-0235
September 16, 2009

At a Glance

Catalyst for Improving the Environment

Why We Did This Review

The accuracy of continuous emissions monitors is critical to the U.S. Environmental Protection Agency's (EPA's) Acid Rain Program because data from these monitors determine the number of allowances a utility can bank, sell, or trade. Specialized gases known as "EPA Protocol Gases" are used to calibrate and assure the quality of these monitors. We sought to determine whether certified concentrations of these gases are accurate.

Background

Vendors produce and certify EPA Protocol Gases in high-pressure cylinders according to EPA procedures. EPA regulations require the use of these gases, or National Institute of Standards and Technology (NIST)-certified reference materials, when conducting quality assurance for continuous emissions and ambient air monitoring systems. EPA's Acid Rain Program requires that the certified concentration of the gases be within ± 2 percent of the true concentration.

For further information, contact our Office of Congressional, Public Affairs and Management at (202) 566-2391.

To view the full report, click on the following link:
www.epa.gov/oig/reports/2009/20090916-09-P-0235.pdf

EPA Needs an Oversight Program for Protocol Gases

What We Found

We purchased 87 cylinders of EPA Protocol Gases and had NIST analyze each cylinder to determine whether the three gaseous mixtures contained in each cylinder (carbon dioxide, nitric oxide, and sulfur dioxide) met the Acid Rain Program's accuracy criterion. We found that 89 percent (233 components) met the Acid Rain Program's accuracy criterion and 11 percent (28 components) did not. Of the 28 components that did not meet the criterion, 17 were within 3.0 percent of the NIST-determined true concentration; 7 were within 3.0 to 5.0 percent; and 4 exceeded the true concentration by more than 5.0 percent.

Our sample was not designed to estimate the impact of the test results on the Acid Rain Program. However inaccurately certified concentrations could cause system operators to unknowingly calibrate their monitoring systems to record inaccurate measurements. For example, if a utility overstates its emissions, it could lose the opportunity to sell allowances to other utilities. If a utility understates its emissions, the utility and regulators may incorrectly conclude that the source is complying with emissions standards. With respect to ambient air monitoring, the accuracy of these monitors is important because the data are used to determine whether areas are in compliance with the Nation's ambient air quality standards.

EPA has conducted only two tests of the accuracy of EPA Protocol Gases since 1997, when EPA's Office of Research and Development discontinued its annual testing program. Thus, EPA does not have reasonable assurance that the gases used to calibrate emissions monitors for the Acid Rain Program and continuous ambient monitors for the Nation's air monitoring network are accurate.

What We Recommend

We recommend that the Office of Air and Radiation (OAR) implement oversight programs to assure the quality of EPA Protocol Gases used to calibrate continuous emissions monitoring systems and ambient air monitors. We also recommend that the Office of Research and Development (ORD) update and maintain the protocol gas procedures to ensure that the protocol meets the objectives of the Acid Rain, ambient air, and stationary source air programs. OAR and ORD concurred with our recommendations. OAR has initiated efforts to conduct another gas audit later this year. OAR also plans to propose a rule later in 2009 to establish a largely self-supported, annual gas audit program of protocol gases used for the Acid Rain Program. Further, OAR plans to implement a separate verification program to address the lower concentration protocol gases used to calibrate continuous ambient air monitors. ORD will update and maintain the protocol gas procedures. EPA's planned actions meet the intent of our recommendations.