



## FACT SHEET

### EPA's ETV Program Verifies Ambient Ammonia Analyzers

EPA's Environmental Technology Verification (ETV) Program, part of the National Risk Management Research Laboratory (NRMRL) headquartered in Cincinnati, Ohio, has verified the performance of ambient ammonia analyzers designed to measure ammonia emissions from animal feeding operations (AFOs).

#### Background

AFOs are the largest source of atmospheric ammonia ( $\text{NH}_3$ ) emissions in the United States, accounting for more than 70% of those emissions. Ammonia has been shown to cause respiratory tract irritation and is highly reactive. It also combines with certain atmospheric pollutants to form secondary fine particulate matter known as  $\text{PM}_{2.5}$ .

While ammonia emissions are not currently regulated at the federal level,  $\text{PM}_{2.5}$  is regulated under the Federal Clean Air Act. Availability of analyzers that accurately measure ammonia is of critical importance in light of the growing need to assess ammonia emissions from AFOs. These analyzers help study patterns in ammonia emissions from AFOs and help evaluate the effectiveness of farm management practices and treatments to reduce ammonia emissions. There are a number of novel real-time, or near real-time, ammonia monitoring technologies that are commercially available and provide significant advantages over traditional integrated sampling techniques. These technologies provide continuous monitoring data that can be viewed remotely and are much less labor intensive than integrated sampling and analysis. However, performance data on the use of these technologies at AFOs have been limited until now.

#### Performance Verification

ETV, in cooperation with Battelle, an EPA partner, verified the performance of ammonia analyzers from seven companies. The verified analyzers utilize several different analytical technologies, and some have features useful in specialized ammonia measurement applications. The developers of the verified analyzers, working under Battelle's EPA cooperative agreement, are: Aerodyne Research, Inc.; Bruker Daltonics, Inc.; Mechatronics Instruments BV; Molecular Analytics; Pranalytica, Inc.; Ominsens SA; and Thermo Electron Corporation. The verification test was designed to evaluate relative accuracy, linearity, precision, response time, calibration and zero drift, interference effects, comparability, ease of use, and data completeness. The U.S. Department of Agriculture collaborated with EPA in completing these verifications. The verification test results for these analyzers are available on the ETV Web Site at <http://www.epa.gov/etv/verifications/vcenter1-30.html>.

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## **Future Verifications**

In addition to completing verification of ammonia analyzers, ETV is soliciting vendors to participate in a verification test of ambient hydrogen sulfide monitors, also used for measuring emissions from AFOs. As with the ammonia analyzer verification, this project will be conducted in collaboration with the U.S. Department of Agriculture. The verification test for the hydrogen sulfide monitors is scheduled to begin in April 2005.

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