

Preliminary Results from the CASTNET Ammonia Special Study

Christopher Rogers¹, Kevin Mishoe², Marcus Stewart², Michael Smith²,
Garry Price², H. Kemp Howell²

As part of the CASTNET monitoring program, AMEC is conducting a special study for the U. S. Environmental Protection Agency that compares methods for collecting sulfur and nitrogen containing compounds at five CASTNET sites for one year. The CASTNET 3-stage filter pack captures particulate sulfate (SO_4^{2+}), ammonium (NH_4^+), and nitrate (NO_3^-) on the first (Teflon) filter; gaseous nitric acid (HNO_3) and part of the gaseous sulfur dioxide (SO_2) on the second (nylon) filter; and the remainder of the SO_2 on the final (potassium carbonate-impregnated cellulose) filters. Regarding nitrogen, CASTNET measurements represent only part of the nitrogen budget with gaseous ammonia (NH_3) being a key missing species. The goals of the study are to: assess the precision, accuracy, and bias of Radiello passive ammonia samplers, used for the NADP Ammonia Monitoring Network (AMoN); characterize Met One SuperSASS mini parallel plate denuders for NH_3 collection; and compare SuperSASS ion module collection, used for the Chemical Speciation Network (CSN), with CASTNET 3-stage filter pack collection.

Duplicate annular denuder systems (ADS) are deployed as the reference method. Site selection was based on proximity to ammonia emissions sources, operator capability, and collocation with AMoN. Sampling began in August 2010 and will continue through September 2011, a total of ten 2-week sampling periods. Preliminary review of the data collected during the first half of the study shows good agreement between the ADS and the CASTNET filter pack, SuperSASS ion module, and AMoN passive NH_3 sampler. The SuperSASS NH_3 module produced concentrations lower than the ADS.

¹ AMEC E&I, Inc., 3901 Carmichael Ave., Jacksonville, FL 32207, 904.391.3744,
cmrogers@mactec.com

² AMEC E&I, Inc., 404 SW 140th Terr., Newberry, FL 32669, 352.332.3318,
kpmishoe@mactec.com, mostewart@mactec.com, mjsmith@mactec.com,
glprice@mactec.com, and hkhowell@mactec.com.