Ambient Monitoring of Ethylene Oxide

(Updated 7/27/2022)

What experience does South Coast AQMD have conducting ambient monitoring for toxic air contaminants?
South Coast AQMD has been monitoring toxic air contaminants, including Volatile Organic Compounds (VOCs), for many years to satisfy the requirements of U.S. EPA's National Air Toxics Trends Stations (NATTS) program. Additionally, South Coast AQMD has for years conducted this type of monitoring for our Multiple Air Toxics Exposure Study (MATES) as well as for special projects and during Emergency Response Incidents. Monitoring for ethylene oxide (EtO) began in 2020 when the U.S. EPA added this species to the list of NATTS pollutants.

What testing method does South Coast AQMD use to conduct ambient monitoring of EtO?
South Coast AQMD conducts ambient monitoring for EtO based upon the 2016 NATTS Technical Assistance Document (TAD) using U.S. EPA Compendium Method TO-15. Our laboratory has already started to adopt some of the more stringent quality control requirements, including the stricter canister cleanliness criteria described in U.S. EPA Compendium Method TO-15A, which will be fully adopted later this year.

Has South Coast AQMD confirmed that methods TO-15 and TO-15A are the appropriate methods?
Yes, South Coast AQMD has had numerous discussions and confirmed with U.S. EPA that TO-15 and TO-15A are the only federally approved methods for measuring EtO in ambient air.

What issues have been raised about using TO-15 and TO-15A for measuring EtO?
The primary concern is that the use of stainless-steel canisters, which are typically used to collect VOC samples, may lead to EtO growth and bias higher results. Studies have shown that silica-lined stainless-steel canisters minimize this problem by stabilizing EtO after collection. South Coast AQMD only uses silica-lined stainless-steel canisters that have been validated for EtO monitoring.

How does South Coast AQMD guarantee canister cleanliness and ensure the samplers do not present EtO bias?
All silica-line stainless-steel canisters are cleaned and undergo rigorous assessment testing prior to use. Canisters failing this assessment are recleaned and reevaluated to eliminate any risk of contamination. Only canisters that pass this assessment are used for EtO monitoring. All our canister samples are typically analyzed for EtO within 7 days from collection, much earlier than the 30 days maximum allowed by the U.S. EPA.

What types of quality assurance is conducted to ensure EtO monitoring results are accurate?
A Quality Assurance Project Plan for EtO measurements in ambient air, and specific standard operating procedures and quality assurance documents have been developed to ensure EtO monitoring results are scientifically valid and follow U.S. EPA procedures. South Coast AQMD tests canisters for cleanliness before sample collection, analyzes samples quickly and follows U.S. EPA's approved methods to ensure accurate results. For more information on our quality assurance protocols and procedures please contact Dr. Brandon Feenstra (Quality Assurance Manager; bfeenstra@aqmd.gov) or Dr. Andrea Polidori (Director of Monitoring and Analysis; apolidori@aqmd.gov).