

Fenceline Sensor Loan Program for Improved Screening & Characterization of Volatile Organic Compound Emissions

FACT SHEET

Background

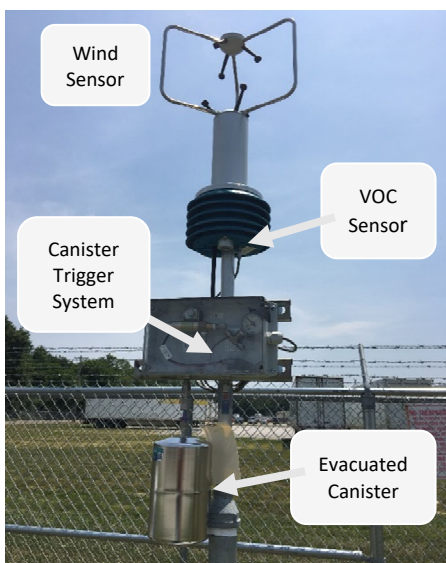
Industries, regulators, and communities have a mutual interest in minimizing emissions of air pollutants and odorous compounds. Under the Next Generation Emission Measurement (NGEM) Program, the EPA, private sector, and state and local partners have been working to develop new lower-cost sensor and emissions source measurement approaches that can assist facility operators, regulators, and others in the detection and assessment of unanticipated or excess air pollutant emissions.

To help advance NGEM, EPA Region 4, with support from the EPA's Office of Research and Development (ORD), is working with delegated air regulatory agencies on a project basis to support the deployment of Sensor Pods (SPods) near facility fencelines to better understand emissions and sources of volatile organic compounds (VOCs), some of which are hazardous air pollutants (HAPs). VOCs can also contribute to odor nuisances and ground-level ozone formation.

Fenceline VOC sensors can help the EPA and delegated regulatory agencies gain a better understanding of emissions sources and provide indications of whether VOC concentrations are higher than expected. These sensors can also help facility operators better monitor emissions on a near real-time basis and optimize strategies for minimizing emissions.

Air Monitoring of VOCs

VOC concentrations in ambient air are generally highest closer to emissions sources and disperse with distance. Concerns about odors and potential health impacts associated with VOCs are common in "fenceline" communities that are located near emissions sources. Meanwhile, the types of community air



An EPA prototype SPod is shown here. EPA R4's SPod Loan Program uses improved commercial SPods that are based on EPA ORD's original open-source design.

monitoring systems that are needed to help determine air quality impacts are complex, time-consuming, and expensive. Using lower-cost screening tools to identify areas where further investigation of air quality and/or regulatory compliance is warranted can help with the prioritization of limited resources.

Fenceline VOC Sensor Technology

SPod fenceline VOC sensors were originally developed by the EPA's ORD by combining different sensors into one relatively low-cost unit. SPods use a photoionization detector to register "total" VOCs in the air and a sonic anemometer to measure wind speed and direction continuously. SPods do not detect all types of VOCs and are therefore not appropriate for all types of emissions sources, but they can detect many different VOCs that are commonly emitted by commercial and industrial sources of air pollution.

SPods cannot themselves differentiate between different VOC species. However, SPods can trigger evacuated canisters to collect discrete air samples that can then be analyzed in a laboratory for precise measurement of different VOCs and HAPs. SPods can trigger canister sample collections based on VOC readings and/or wind speed and direction, which allows for optimal sample targeting and timing that is otherwise very difficult to accomplish.

Project Approach and Limitations

Each Fenceline VOC Sensor Loan project has unique objectives, but deployments are generally intended to provide new information on air pollution sources to regulators, operators, and communities, especially where concerns have been raised or indications of disproportionate impacts have been identified.

SPods are designed to be placed near emissions sources to help understand releases from those sources. SPod data alone cannot be used to assess exposures to people living or working nearby or to directly assess whether companies are complying with environmental regulations. However, over time and in combination with canister samples and air dispersion modeling, SPod data can allow for the estimation of actual emission levels and their sources, which can identify previously unknown or potentially excessive emissions. As a uniquely cost-effective screening tool, SPods can provide useful information to explore concerns, identify potential issues, and inform decision-making on whether further investigation or action is needed.

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