

What Goes On At An Air Monitoring Site?

Inside a CAMS (continuous air monitoring station) trailer there may be one or more of the following analyzers: ozone, sulphur dioxide, carbon monoxide, and oxides of nitrogen. These ambient air monitoring analyzers run 24 hours a day. Outside some trailers, there are meteorological sensors at the top of a 30 ft tower and on the roof. The sensors include wind speed, wind direction, temperature, relative humidity, solar radiometer, ultraviolet radiometer, precipitation, and barometric pressure.

The voltage outputs from each analyzer or sensor are sent to and stored as 5 minute averages in the datalogger inside the trailer. Every 15 minutes, the TCEQ (Texas Commission on Environmental Quality) computer system in Austin connects to the trailer's datalogger via phone lines and the 5 minute data records are transmitted to Austin. The Austin computer converts the voltages to the final units of parts per billion (ppb), etc. Some meteorological data is already converted to final units of miles/hr, etc. by the datalogger at the site. While in the station, we can connect to the datalogger with the PC and view our millivolt data from each monitor.

The ambient air is drawn in through the probe inlets on the roof of the trailer. An inlet consists of a glass funnel and Teflon tubing that runs down into the inside of the trailer through a PVC pipe. Each one connects to a gaseous analyzer (O₃, SO₂, CO, NO_x).

Each gaseous analyzer is checked automatically every day with the calibration system. The calibration system consists of a clean, dry air, or "zero" air supply, a dilution calibrator, and sometimes a concentrated, pressurized, gas cylinder. The calibration system can generate "zero" concentrations of gas and also different "span" concentrations of gas to check each analyzer.

Also outside some trailers, there are particulate monitors. One type is considered continuous because the particulates are analyzed instantaneously and the data is transmitted to the Austin computer as it is for the gaseous and meteorological monitors. This type of particulate monitor is called "TEOM" (tapered element oscillating microbalance) and analyzes the PM_{2.5} (2.5 micron and smaller) particulates. There are also intermittent particulate monitors for PM₁₀ (10 micron and smaller) and PM_{2.5}. For the intermittent samplers, filters need to be installed before the sample period, removed afterwards, and weighed by a laboratory to get the final $\mu\text{g}/\text{m}^3$ concentration over a 24 hour period.

Air Monitoring Personnel perform preventative maintenance inspections, audits, calibrations, verification checks, troubleshooting, and repair on all these instruments. Data Validators will verify or reject continuous monitors' data using an electronic program which is part of the TCEQ system. After that, data files are made, sent to TCEQ, and eventually uploaded to the U.S. EPA Air Quality System (AQS) database, which is U.S. EPA's repository of ambient air quality data.