

PORTABLE EMISSION ANALYZER STANDARD OPERATING PROCEDURES (SOP)

A number of quality assurance activities are undertaken before, during, and after each testing project. The following paragraphs detail the quality control techniques, which are rigorously followed during testing projects.

Each instrument's response is checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity is checked by first adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response is then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within ± 2 percent of range of the predicted values.

The analyzers are periodically checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documents the precision of the data collected. The criterion for acceptable data is that the instrument drift is no more than 3 percent of the full-scale response. Quality assurance worksheets are prepared to document the multipoint calibration checks and zero to span checks performed during the tests.

The sampling system is leak checked after the system is set up and before the system is dismantled. This test is conducted to ensure that ambient air does not dilute the sample. Any leakage detected prior to the tests would be repaired and another leak check conducted before testing commenced.

The control gases used to calibrate the instruments are analyzed and certified by the compressed gas vendors to $\pm 1\%$ accuracy for all gases. EPA Protocol No. 1 was used, where applicable to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials.

Air Hygiene, Inc. maintains a large variety of calibration gases to allow the flexibility to accurately test emissions over a wide range of concentrations.

Test runs are conducted for approximately ten (10) minutes (or until stable). After the instrument has reached a stable reading AHI will provide measurements for NO_x, CO, Oxygen, and combustion parameters with our direct reading instruments. Three emission samples will be taken from the centroid of the exhaust stack within one (1) hour. The results of the three (3) tests will be averaged to determine compliance. If any one of these samples is not within a 10% average, the remaining two (2) sample averages will be used for determining compliance. During emissions tests, engine RPM, fuel consumption, operating horsepower, and exhaust temperatures will be monitored and recorded.

A report detailing the results of each quarterly test will be prepared. This report will meet the requirements of the respective state agency for quarterly compliance testing and will include a discussion of the following:

- Facility Information (Gas analysis, accumulated operating hours, flow meter calibration data)
- Engine Operating Parameters (timing setpoints, speed, horsepower, and fuel flow)
- Summary of Test Results
- Sampling and Analytical Procedures
- QA/QC Activities (i.e. analyzer calibration, calibration gas certifications)