**Section 291.204 Meteorological Data**

a) Meteorological data is required for input to the various annual and short-term dispersion models as well as for the identification of the frequency and duration of conditions when short-term, high air pollution concentrations may be expected to exist. Hourly meteorological data shall be acquired from:

1) Acceptable on-site meteorological monitoring equipment physically located within the study area or

2) The nearest National Weather Service weather reporting station which can be justified as having meteorological conditions representative of the study area.

b) On-site monitors. To be acceptable, the monitoring site must have been maintained and operated as a continuous meteorological sensing network designed to determine the wind and temperature structure controlling downwind transport and the dispersion of pollutants.

1) The system shall contain adequate instrumentation for measuring the following parameters at or near 10 meters above ground-level: wind speed, wind direction and dry bulb temperature. A determination of the wind speed, wind direction and air temperature in the mixing layer must have been made at least twice every 24-hour period by use of remote sensing techniques such as pibals, radiosondes, acoustic sounders or aircraft.

2) A record of the maintenance and service schedule must be available to allow the determination of acceptability of on-site meteorological monitoring equipment. The service and maintenance should have been performed at a frequency necessary to maintain a minimum of 90% data recovery per parameter per quarter. Maintenance should have included periodic cleaning, testing and calibration of all sensors and recorder.

3) Justification should be submitted with the operating application including that the meteorological parameters measured at the on-site monitor(s) are representative of the meteorology in the study area. Included in this justification should be a discussion of the effects of local terrain, bodies of water, heat islands and any other conditions which could substantially affect the meteorology of the area.

c) No on-site monitors. If on-site meteorological monitoring equipment is unavailable or not selected for use, a justification must be submitted indicating that the meteorological parameters which are utilized are representative of the study area. Meteorological data may be obtained from the following sources:

1) Seasonal and annual wind speed, wind direction, and atmospheric stability. The National Climatic Center (NCC) in Asheville, North Carolina has wind speed and wind direction data available as part of hourly or three-hourly weather records. Data for wind speed and wind direction are combined with atmospheric stability in a joint frequency distribution called a STAR Program. Various forms of stability wind rose data are available from NCC in tabular form, on punched cards, and on magnetic tape. The tapes include the hourly or three-hourly observations upon which the stability wind rose is based. Five-year, annual, seasonal and monthly stability wind roses are available.

2) Mixing height. Climatological summaries of mixing heights based on radiosonde observations are available in Mixing Height, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States (AP-101) by George Holzworth of the U.S. Environmental Protection Agency (USEPA). Data contained in this text are acceptable for utilization with annual dispersion modeling analyses. Mixing height data for use in determining short-term air quality levels may be computed from measured meteorological parameters using the methods outlined in the USEPA's AQMA Guideline Document 10 or the USEPA's Interim User's Guide to a Computation Technique to Estimate Maximum 24-Hour Concentrations from Single Sources. Radiosonde observation data is available for selected meteorological sites from the NCC.

3) Temperature. Hourly, three-hourly and annual mean temperature records for meteorological reporting sites are available from the NCC.

4) Hourly atmospheric stability. The atmospheric stability data may be estimated from other meteorological parameters by Turner's Method, which is explained in AQMA Guideline Document 10. The method requires: solar altitude, cloud cover, ceiling and wind speed. The solar altitude can be obtained from Table 170 entitled "Solar Altitude and Azimuth" in the Smithsonian Meteorological Tables. Cloud cover and ceiling are available as hourly or three-hourly observations from the NCC. The solar altitude, time of day, cloud cover and ceiling can be used to index the solar radiation intesity which, together with the wind speed, determines the atmospheric stability.