

5.0 ENVIRONMENTAL ASSESSMENTS, MONITORING, AND MODELING UNDER SUBPART X

This section discusses approaches to monitoring and modeling potential releases from Subpart X units. Some emphasis is placed on OB/OD units because of the difficulty in monitoring and modeling air emissions from such units. The chapter consists of three major sections: environmental assessments, monitoring, and modeling. The monitoring and modeling sections include subsections on air and groundwater.

View the slide presentation from the February 2002 Region 4 Advanced RCRA Miscellaneous Units Permitting and Compliance Training.

5.1 ENVIRONMENTAL ASSESSMENTS (Characterization of Media)

Environmental assessments are performed to characterize the potential effects on each of the environmental media (air; groundwater and the subsurface environment; and surface water, wetlands, and surface soils) caused by releases from a Subpart X unit. The assessment should demonstrate that the unit will be operated in a way that will be protective of human health and the environment, and demonstrate compliance with the specific performance standards for each environmental medium. Specific performance standards are set forth in 40 CFR §264.601.

An environmental assessment evaluates the possible impacts of a Subpart X unit on environmental media, and describes preventative measures that have or will be taken.

The environmental assessment information required of permit applicants includes:

- Detailed hydrologic, geologic, and meteorologic assessments and land-use maps for the area surrounding the site that address and ensure compliance of the unit with the environmental performance standards set forth under 40 CFR §264.601
- Information about the potential pathways of exposure of humans or environmental receptors to hazardous constituents and about the potential magnitude and nature of such exposures

- For any treatment unit, a demonstration of the effectiveness of treatment that is based on laboratory or field data
- Any additional information determined by the EPA Regional Administrator to be necessary for evaluation of the compliance of the unit with the environmental performance standards set forth under 40 CFR §264.601

40 CFR Section 270.23(b) allows a permit applicant to submit a preliminary hydrologic, geologic, and meteorologic assessment if an adequate demonstration can be made that the Subpart X unit will not violate performance standards under 40 CFR §264.601. The permit writer should accept a preliminary assessment only if the applicant can demonstrate convincingly that releases from the unit will be minimal.

The permit applicant can make that demonstration through a combination of data that indicates the efficacy of the treatment, a discussion of release controls for the unit and other information related to process operations at the unit, and environmental parameters specific to the site. Permit writers should use the available information on unit design, wastes that might be treated at the unit, and other permit application information that must be submitted with the permit application to determine whether a preliminary assessment is acceptable.

Compared with detailed assessments, preliminary air assessments require significantly less information. A preliminary air assessment should include information about the atmospheric, meteorological, and topographic characteristics of the areas in the vicinity and how those characteristics will affect any releases of contaminants from the Subpart X unit. The characteristics are important factors in the transport and dispersion of contaminants. For example, wind conditions will determine the direction in which contaminants are transported from a source and the speed at which they are transported. A knowledge of topographic features in the area also is important in evaluating how potential air releases may interact with the terrain. A permit applicant should submit

Hint:

Having an applicant develop a conceptual site model (CSM) as part of the environmental/risk assessment will help in understanding potential exposure pathways associated with each unit.

topographic maps of the site and all neighboring areas that may be affected by an air release. At a minimum, an applicant submitting a preliminary air assessment should provide the following information:

- A wind rose
- Seasonal mean humidity
- Annual and 24-hour precipitation data
- Atmospheric stability data
- Population (e.g., census) data
- Topographic maps of neighboring areas

These data may be available from a variety of sources. The permit writer should evaluate the data and the source of the data to determine whether the data are valid and representative of the site. The most likely sources of meteorological data include on-site measurements, the National Weather Service, the National Climatic Data Center, and nearby military or civilian airports. Sources of population data include the U.S. Bureau of the Census and local city and county census information.

National Weather Service (NWS) meteorological input data are normally obtained either from the National Climatic Data Center
<http://www.ncdc.noaa.gov/ol/ncdc.html> or
SCRAM - [http://www.epa.gov/ttn/scram/
menu.htm](http://www.epa.gov/ttn/scram/menu.htm)

Typically, EPA Region 4 requires a detailed assessment for OB/OD units and for regeneration and thermal desorption units that vent to the atmosphere. For a detailed assessment, the permit applicant is required to provide more information about the operation of the unit and its potential effects. When conducting a detailed assessment, a permit applicant may choose to use worst-case assumptions, rather than collect complex site-specific data for the analysis. That type of detailed assessment is referred to as a “screening” assessment. A “refined” assessment is one in which various site-specific data are collected to provide a more realistic evaluation of the potential effects on human health and the environment resulting from the release of a contaminant.

A screening air assessment typically includes less site-specific information than a refined air assessment, but uses conservative default values in analyses performed to determine the magnitude of potential effects. Permit applicants prefer screening assessments because they reduce the cumbersome task of collecting sufficient data to perform the analyses. It is important that the permit writer assess whether the permit application makes a defensible case for using the screening assessment approach. If a permit applicant can provide, through a screening air assessment that uses conservative assumptions, an adequate demonstration of compliance a refined assessment is not necessary. Before accepting a screening assessment as an appropriate approach, the permit writers should be careful to ensure that assumptions made for screening analyses actually are conservative values.

Refined air assessments are more complex than screening assessments because they rely less on assumptions about the fate and transport of air emissions and require that the applicant use more site-specific data. Refined assessments provide a more realistic estimate of effects on air. Examples of detailed site-specific data that may be required for a refined air assessment include site-specific meteorological data, detailed terrain data on the terrain in the vicinity of the installation, and actual source release measurements of releases from the source.

Both preliminary and detailed assessments are conducted separately for each of the three environmental media groups listed in 40 CFR §264.601; air; groundwater and the subsurface environment; and surface water, wetlands and surface soils. Specific requirements for assessments of each medium are discussed separately below.

5.2 Monitoring of Air and Groundwater

Monitoring focuses on the actual gathering of data relevant to the operation of a unit. The data obtained is used in characterizing the risk to human health and the environment. The permit applicant will have obtained basic environmental data on the

Three Types of Site Assessments

- **Preliminary assessments - based largely on a qualitative consideration of risk.**
- **Screening assessment - based on “worst-case” modeling data and, if available, monitoring data.**
- **Detailed assessments - require site-specific monitoring and modeling.**