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FACT SHEET

Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)

The ambient impact requirement is one of the more complex regulatory requirements to meet because there are several options that can be used to demonstrate compliance and some of the options require the use of an air dispersion model. This summary will explain the requirement and give a hierarchy of compliance options starting with the simplest and ending with the most complex option.

The ambient impact requirement states that sources must demonstrate that their emissions of TAPs will not endanger the public health. The mechanism for making this demonstration is showing that the maximum off-site concentrations that will result from the emissions of a TAP will not exceed a screening concentration or level which is based on the toxicity or carcinogenicity of the TAP. A person generally has to know the screening levels for a TAP to perform the ambient impact analysis. Calculating the screening levels for the TAPs being analyzed is the first step in the ambient impact analysis.

These screening levels would be averaged over different time periods depending on the toxic or carcinogenic effects of the TAP. For example, benzene, a carcinogenic material, has several screening levels. It has an annual screening level of 1.21 micrograms per cubic meter. This is calculated by dividing the acceptable increased risk defined in the TAP regulations (one in one hundred thousand or 10^{-5}) by the unit risk factor (8.3×10^{-6} meters cubed per microgram ($m^3/\mu g$)). EPA calculates the unit risk factors and the MDE will provide companies with risk-based screening levels because these unit risk factors are not generally available. The threshold-based screening levels are typically calculated by dividing the Threshold Limit Values (TLVs) as published by the American Council of Governmental and Industrial Hygienists (ACGIH) by a safety factor. The time weighted average (TLV-TWA) is divided by 100 to derive the 8-hour screening level. To derive a 1-hour screening level, divide the short term exposure limit or the Ceiling Limit (TLV-STEL or TLV-C) by 100. In the case of benzene, it has a TLV-STEL of 8 milligrams per meter cubed (mg/m^3) and a TLV-TWA of 1.6 mg/m^3. Therefore benzene has a 1-hour screening level of 0.08 mg/m^3 (or 80 micrograms per meter cubed ($\mu g/m^3$)), an 8-hour screening level of 0.016 mg/m^3 (or 16 micrograms per meter cubed ($\mu g/m^3$)), and an annual screening level of 1.21 $\mu g/m^3$. If the TAP does not have a TLV, other data can be used to calculate the screening level. These procedures are described in COMAR 26.11.16.03.

The next step in demonstrating compliance with the ambient impact requirement is to determine the maximum hourly emission rates over the averaging periods of the screening levels. This is extremely important. For example, a piece of equipment may discharge 1 pound per hour (lb/hr) but only operate 3 hours in any 8-hour period. This means the maximum hourly emission rate for demonstrating compliance with an 8-hour screening level should be ((3 hr x 1 lb/hr)/(8 hr)) or 0.375 lb/hr. If a material has an annual screening level (e.g. benzene), then the hourly rate must be annualized. For example, if the

maximum hourly discharge rate is 1lb/hr and the piece of equipment discharges 2000 hours per yr (hr/yr), the annualized hourly emission rate is (1 lb/hr x 2000 hr/yr)/(8760 hr/yr) or 0.23 lb/hr.

With the screening levels and the emission rates known, it is time to examine the hierarchy of compliance options, starting with the simplest and ending with the most complex.

1. COMAR 26.11.15.03(B)(3)(a) and (b): The Small Quantity Exemption

This exempts the emissions of a pollutant that meet certain emission rate and toxicity criteria from both control requirements and an ambient impact analysis.

2. COMAR 26.11.15.03.(B)(4): The Small Impact Exemption

This exempts the emissions of certain pollutants (Class II) from the ambient impact requirement if the premises-wide emissions of the pollutant do not create an off-site impact greater than 0.02 micrograms/meter cubed ($\mu g/m^3$).

3. COMAR 26.11.16.02: Charts of Allowable Emissions

The charts in COMAR 26.11.16.02 gives allowable emission rates (premise-wide) based on the screening level of the pollutant. Alternatively, the four tables can be simplified to these four equations:

Annual, Stack & No Downwash	AER = 1664 x SL
Annual, No Stack or Downwash	AER = 365 x SL
Hourly Rate, Stack & No Downwash	AER = 0.0163 x SL
Hourly Rate, No Stack or Downwash	AER = 0.00356 x SL

AER = Allowable emission rate in pounds per year (lb/yr) or pounds per hour (lb/hr), appropriately.
SL = The appropriate screening level for the pollutant in micrograms per cubic meter ($\mu g/m^3$).

If the maximum emission rate is less than the calculated allowable emission rate for the TAP, then that emission would be in compliance with the ambient impact requirement.

4. Hand Dispersion Calculations: Technical Memorandum TM 86-02

The Technical Memorandum TM 86-02 provides a methodology to predict off-site concentrations of a TAP.

If the concentrations predicted by TM-86-02 are less than the screening level of the TAP for the appropriate averaging times, the emission of the TAP would be in compliance with the ambient impact requirement.

5. Screening Computer Model.

EPA's T-SCREEN is a quick, relatively user-friendly, air dispersion screening model that can be downloaded off EPA's SCRAM website (http://www.epa.gov/scram001). However, any EPA approved dispersion model can be used and there are other screening models available. Screening models do not require the use of actual meteorological data and will predict higher concentrations than models that use

actual meteorological data.

If the predicted off-site concentrations of a TAP are less than the screening levels for the appropriate averaging times, the emission of the TAP would be in compliance with the ambient impact requirement.

6. Refined Computer Model.

Refined computer models, such as ISCST or ISCLT, use actual meteorological data to predict off-site concentrations. Any refined model that is approved by EPA and appropriate for the situation can be used. The Department generally requires that 5 consecutive years of meteorological data be used and that all regulatory default options are employed. It is suggested that persons using refined computer modeling to demonstrate the compliance with the ambient impact requirement contact the Department for additional guidance.

If the predicted off-site concentrations of a TAP are less than the screening levels for the appropriate averaging times, the emission of the TAP has complied with the ambient impact requirement.