TCEQ Interoffice Memorandum

To: Air Permits Division
Office of Air

From: Toxicology, Risk Assessment, and Research Division
Office of the Executive Director

Date: July 10, 2025

Subject: Toxicology Guidance: For Informational Purposes Only
Guidance on ESL Exceedances for Air Permitting (Tier III Evaluations)

This memo serves to provide information about the Toxicology, Risk Assessment, and Research Division (Toxicology) in-house general guidelines for Tier III evaluations of air permit reviews. The current toxicology guidance is being offered as a courtesy to provide context to TCEQ Air Permit Division staff about the magnitude and frequency of exceedances that Toxicology may consider acceptable, unacceptable, or allowable or not when conducting a Tier III review of an air permit. As stated in Appendix D of the Modeling and Effects Review Applicability (MERA) Reference Guide, i.e., APDG 5874 v5 (Revised 03/18,), such reviews are conducted on a case-by-case basis, and only an assessment of risk by Toxicology can determine whether the guidelines described herein are applicable to any given permit. **These guidelines do not provide a substitute for expert toxicology judgment and analysis, nor are they intended to be applied in the absence of a Toxicology review.**

Please note that this 2025 guidance memo supersedes any other previous general toxicology guidance on the review of health effects for air permit applications (e.g. 2001 DRAFT memo or 2007 Toxicology Memo). As such, the 2001 and 2007 memos are now both obsolete and invalid.

When evaluating the magnitude and frequency of effect screening level (ESL) exceedances of modeled impacts for applicable chemical species at non-transient receptors, Toxicology considers many factors to determine whether there is the potential for risk to human health or welfare. These factors include the type and nature of surrounding land use, potential for public exposure, conservatism of the modeling assumptions used to determine the modeled impacts, existing concentrations of the chemical species, basis of the ESLs (e.g., odor vs. health, degree of confidence in the data, margin of safety involved in the derivation, etc.), the regulated entity's complaints and compliance history, etc. For this reason, evaluating the magnitude and frequencies of ESL exceedances cannot be viewed in isolation to determine whether a project's modeled emissions will be allowable.

The following Toxicology Tier III guidelines address:

- Short-term and long-term maximum predicted, off-property, ground-level concentrations ($GLCs_{max}$) above the ESL.
- Short-term and long-term maximum predicted, off-property, ground-level concentrations at non-industrial receptors ($GLCs_{ni}$) above the ESL.

- Potentially allowable hourly frequencies of ESL exceedances at the short-term $GLCs_{max}$ or $GLCs_{ni}$.

The general guidelines in the following tables were discussed and approved, with the understanding that a permit-specific Tier III review could allow for alternative GLC exceedances of ESLs. *However, please note that these guidelines are not applicable in air pollutant watch list (APWL) areas for APWL chemicals. Further information about air permit impacts reviews in APWL areas can be found on this webpage: https://www.tceq.texas.gov/toxicology/apwl*.

Types of ESLs

The tables below include guidance for ESL exceedances, depending on the type of ESL. The relevant types of ESLs are interim and final. Generally, the basis for the interim ESLs is health. Among the final ESLs, there is a further distinction for the basis of the ESL: health, odor, vegetation, or animal. For any chemical of interest involved in a permit review, the appropriate ESLs can be accessed from the Texas Air Monitoring Information System (TAMIS) database via this link: https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome.[1]

Although these tables include guidance on most of the types of ESLs and the scenarios to which they may be applied, they do not exhaustively include every potential permutation of ESLs and the applicable scenarios.

Table Summaries

Table 1A (short-term concentrations) and **Table 1B** (long-term concentrations) provide the general guidelines used for chemicals with **interim ESLs**. Interim ESLs represent screening levels that were typically derived based on limited data, and therefore the interim ESLs tend to be more conservative than final ESLs that were derived based on more available scientific data.

Table 2A (short-term concentrations) and **Table 2B** (long-term concentrations) provide the general guidelines used for chemicals with **final ESLs** that are **health-based**. The final ESLs have undergone a comprehensive development support document (DSD) review based on the TCEQ Guidelines to Develop Toxicity Factors (RG-442).[2]

Table 3 (short-term concentrations) provides guidance for those chemicals with **final ESLs** that are **odor- or vegetation-based**, and for which there are not separate guidelines.

[1] Further information about how to access ESLs in the TAMIS database can be found on the Toxicology webpage: https://www.tceq.texas.gov/toxicology/database/tox.
[2] A DSD summarizes how chemical-specific toxicity Effects Screening Levels, Reference Values, and Unit Risk Factors were derived based on RG-442, TCEQ Guidelines to Develop Toxicity Factors. The guidelines can be found on the Toxicology webpage: https://www.tceq.texas.gov/downloads/toxicology/publications/rg-442.pdf.

Table 1A. Potentially allowable exceedances for chemicals with interim ESLs: Short-term predicted concentration (1-hr averages).

Description of Area of Impact		Type of Compound	Magnitude of Exceedance	Frequency of Hourly Exceedances per Year
Land	Industrial area	VOCs or Speciated PM	$GLC_{max} \leq 10 \times ESL$	Concentrations > 2 x ESL must be ≤ 24 hr Concentrations > 4 x ESL must be ≤ 10 hr
	Non-industrial area	VOCs or Speciated PM	$GLC_{ni} \leq 2 \times ESL$	Concentrations > 1 x ESL must be ≤ 24 hr
Water	Industrial area	VOCs	$GLC_{max} \leq 25 \times ESL$	Concentrations > 10 x ESL must be ≤ 24 hr Concentrations > 20 x ESL must be ≤ 10 hr
		Speciated PM	$GLC_{max} \leq 10 \times ESL$	Concentrations > 2 x ESL must be ≤ 24 hr Concentrations > 4 x ESL must be ≤ 10 hr
	Recreational area	VOCs	$GLC_{ni} \leq 5 \times ESL$	Concentrations > 2 x ESL must be ≤ 24 hr Concentrations > 4 x ESL must be ≤ 10 hr

PM – particulate matter; VOCs – volatile organic compounds

Table 1B. Potentially allowable exceedances for chemicals with interim ESLs: Long-term predicted concentration (annual averages).

Description of Area of Impact		Type of Compound	Magnitude of Exceedance
Land	Industrial area	VOCs or Speciated PM	$GLC_{max} \leq 2 \times ESL$
	Non-industrial area	VOCs or Speciated PM	$GLC_{ni} \leq 1 \times ESL$
Water	Industrial area	VOCs or Speciated PM	$GLC_{max} \leq 2 \times ESL$
	Recreational area	VOCs	$GLC_{ni} \leq 2 \times ESL$

PM – particulate matter; VOCs – volatile organic compounds

Table 2A. Potentially allowable exceedances for chemicals with finalized health-based ESLs: Short-term predicted concentration (1-hr averages).

Description of Area of Impact		Type of Compound	Magnitude of Exceedance	Frequency of Hourly Exceedances per Year
Land	Industrial area	VOCs or Speciated PM	$GLC_{max} \leq 6 \times ESL$	Concentrations > 2 x ESL must be ≤ 24 hr Concentrations > 4 x ESL must be ≤ 10 hr
	Non-industrial area	VOCs or Speciated PM	$GLC_{ni} \leq 3 \times ESL$	Concentrations > 1 x ESL must be ≤ 24 hr Concentrations > 2 x ESL must be ≤ 10 hr
Water	Industrial area	VOCs	$GLC_{max} \leq 6 \times ESL$	Concentrations > 2 x ESL must be ≤ 24 hr Concentrations > 4 x ESL must be ≤ 10 hr
		Speciated PM	$GLC_{max} \leq 3 \times ESL$	Concentrations > 1 x ESL must be ≤ 24 hr Concentrations > 2 x ESL must be ≤ 10 hr
	Recreational area	VOCs	$GLC_{ni} \leq 3 \times ESL$	Concentrations > 1 x ESL must be ≤ 24 hr Concentrations > 2 x ESL must be ≤ 10 hr

PM – particulate matter; VOCs – volatile organic compounds

Table 2B. Potentially allowable exceedances for chemicals with finalized health-based ESLs: Long-term predicted concentration (annual averages).

Description of Area of Impact		Type of Compound	Magnitude of Exceedance for Threshold Effects (Typically Non-Cancer)	Magnitude of Exceedance for Non-threshold Effects (Typically Cancer)
Land	Industrial area	VOCs or Speciated PM	$GLC_{max} \leq 6 \times ESL$	$GLC_{max} \leq 2 \times ESL$
	Non-industrial area	VOCs or Speciated PM	$GLC_{ni} \leq 3 \times ESL$	$GLC_{ni} \leq 1 \times ESL$
Water	Industrial area	VOCs	$GLC_{max} \leq 6 \times ESL$	$GLC_{max} \leq 2 \times ESL$
		Speciated PM	$GLC_{max} \leq 3 \times ESL$	$GLC_{max} \leq 1 \times ESL$
	Recreational area	VOCs	$GLC_{ni} \leq 3 \times ESL$	$GLC_{ni} \leq 1 \times ESL$

PM – particulate matter; VOCs – volatile organic compounds

Table 3. Potentially allowable exceedances for chemicals with finalized odor- or vegetation-based ESLs (final ESLs with threshold effects): Short-term predicted concentration (1-hr averages).

Description of Area of Impact		Type of Compound	Magnitude of Exceedance	Frequency of Hourly Exceedances per Year
Land	Industrial area	VOCs or Speciated PM	$GLC_{max} \leq 4 \times ESL$	Concentrations > 2 x ESL must be ≤ 24 hr Concentrations > 3 x ESL must be ≤ 10 hr
	Non-industrial area	VOCs or Speciated PM	$GLC_{ni} \leq 2 \times ESL$	Concentrations > 1 x ESL must be ≤ 24 hr
Water	Industrial area	VOCs	$GLC_{max} \leq 4 \times ESL$	Concentrations > 2 x ESL must be ≤ 24 hr Concentrations > 3 x ESL must be ≤ 10 hr
		Speciated PM	$GLC_{max} \leq 2 \times ESL$	Concentrations > 1 x ESL must be ≤ 24 hr
	Recreational area	VOCs	$GLC_{ni} \leq 2 \times ESL$	Concentrations > 1 x ESL must be ≤ 24 hr

PM – particulate matter; VOCs – volatile organic compounds

For any technical questions, please feel free to contact the Toxicology, Risk Assessment, and Research Division via email: tox@tceq.texas.gov or by phone: 512-239-1795 or toll-free 1-877-992-8370.