

TCEQ Interoffice Memorandum

To: Harry Xue, P.E.
Chemical Section

Thru: Chad Dumas, Team Leader
Air Dispersion Modeling Team (ADMT)

From: Justin Cherry, P.E.
ADMT

Date: July 16, 2024

Subject: Air Quality Analysis Audit – TM Deer Park Services LLC (RN100209568)

1. Project Identification Information

Permit Application Number: 50058
NSR Project Number: 371814
ADMT Project Number: 9264
County: Harris

Air Quality Analysis: Submitted by Trinity Consultants, June 2024, on behalf of TM Deer Park Services LLC. Additional information was provided July 2024.

2. Report Summary

The air quality analysis is acceptable for all review types and pollutants. The results are summarized below.

A. Minor NSR and Air Toxics Analysis

Table 1. Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax ($\mu\text{g}/\text{m}^3$)	De Minimis ($\mu\text{g}/\text{m}^3$)
NO ₂	1-hr	27	7.5
NO ₂	Annual	0.2	1

The GLCmax are the maximum predicted concentrations associated with one year of meteorological data.

The justification for selecting EPA's interim 1-hr NO₂ De Minimis level was based on the assumptions underlying EPA's development of the 1-hr NO₂ De Minimis level. As explained in EPA guidance memoranda¹, EPA believes it is reasonable as an interim approach to use a De Minimis level that represents 4% of the 1-hr NO₂ NAAQS.

¹ www.tceq.texas.gov/assets/public/permitting/air/memos/guidance_1hr_no2naaqs.pdf

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Table 2. Total Concentrations for Minor NSR NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Conc. = [Background + GLCmax] ($\mu\text{g}/\text{m}^3$)	Standard ($\mu\text{g}/\text{m}^3$)
NO ₂	1-hr	82	94	176	188

The GLCmax is the maximum predicted concentration associated with one year of meteorological data.

A background concentration for NO₂ was obtained from EPA AIRS monitor 482011035 located at 9525 ½ Clinton Dr., Houston, Harris County. The applicant used a three-year average (2021-2023) of the 98th percentile of the annual distribution of the daily maximum 1-hr concentrations for the 1-hr value. The use of this monitor is reasonable since it is located along the heavily industrialized Houston Ship Channel like the project site and represents the highest design value for Harris County.

Table 3. Minor NSR Project (Increases Only) Modeling Results for Health Effects

Pollutant	CAS#	Averaging Time	GLCmax ($\mu\text{g}/\text{m}^3$)	10% ESL ($\mu\text{g}/\text{m}^3$)
ammonia	7664-41-7	1-hr	1.58	18

3. Model Used and Modeling Techniques

AERMOD (Version 23132) was used in a refined screening mode.

The applicant conducted the 1-hr and annual NO₂ NAAQS analyses using the ARM2 model option following EPA guidance.

A. Land Use

Medium roughness and elevated terrain were used in the modeling analysis. These selections are consistent with the AERSURFACE analysis, topographic map, DEMs, and aerial photography. The selection of medium roughness is reasonable.

The urban option was used in AERMOD to account for enhanced night-time dispersion due to heat island effects associated with the urban area and heat generated from nearby industrial sources. The population chosen was 4,800,000 people. The applicant generally followed EPA guidance from Section 5 of the AERMOD Implementation Guide. The applicant used the population for the entire Harris County without sufficient justification. ADMT conducted test modeling using the population of the Houston area and determined that overall conclusions would not change.

B. Meteorological Data

Surface Station and ID: Houston, TX (Station #: 12918)
Upper Air Station and ID: Lake Charles, LA (Station #: 3937)
Meteorological Dataset: 2020
Profile Base Elevation: 14.3 meters

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C. Receptor Grid

The grid modeled was sufficient in density and spatial coverage to capture representative maximum ground-level concentrations.

D. Building Wake Effects (Downwash)

Input data to Building Profile Input Program Prime (Version 04274) are consistent with the aerial photography, plot plan, and modeling report.

4. Modeling Emissions Inventory

The modeled emission point source parameters and rates were consistent with the modeling report. The source characterizations used to represent the sources were appropriate.

Maximum allowable hourly emission rates were used for the short-term averaging time analyses, and annual average emission rates were used for the annual averaging time analyses.