TCEQ Interoffice Memorandum

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Mechanical/Coatings Section

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

From: Ahmed Omar, P.E.
ADMT

Date: April 14, 2025

Subject: Air Quality Analysis Audit – Modern Concrete and Materials, LLC (RN105022818)

1. Project Identification Information

Permit Application Number: 178788
New Source Review (NSR) Project Number: 387294
ADMT Project Number: 9709
County: Jefferson

Air Quality Analysis: Submitted by Elm Creek Environmental, LLC , March 2025, on behalf of Modern Concrete and Materials, LLC. Additional information and modeling were provided April 2025.

2. Report Summary

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

A. Minor NSR and Air Toxics Analysis

Table 1. Site-Wide Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax[1] (µg/m^3)	Standard (µg/m^3)
SO_2	1-hr	2	817

Table 2. Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr	2	7.8
PM_{10}	24-hr	29	5

[1] Ground level maximum concentration

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
$PM_{2.5}$	24-hr	12	1.2
$PM_{2.5}$	Annual	0.14	0.13
NO_2	1-hr	36	7.5
NO_2	Annual	0.4	1
CO	1-hr	138	2000
CO	8-hr	45	500

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

To show compliance with the secondary annual SO_2 National Ambient Air Quality Standard (NAAQS), the applicant relied on EPA's alternative demonstration approach summarized in a memorandum dated December 10, 2024, with a subject "Alternative Demonstration Approach for the 2024 Secondary Sulfur Dioxide National Ambient Air Quality Standard under the Prevention of Significant Deterioration Program." Based on the technical analysis described in the memorandum, EPA determined that a demonstration that increased SO_2 emissions will not cause or contribute to a violation of the primary 1-hr SO_2 standard can suffice to demonstrate that SO_2 emissions will also not cause or contribute to a violation of the secondary annual SO_2 standard.

The justification for selecting EPA's interim 1-hr NO_2 and 1-hr SO_2 De Minimis levels was based on the assumptions underlying EPA's development of the 1-hr NO_2 and 1-hr SO_2 De Minimis levels. As explained in EPA guidance memoranda[2,3], EPA believes it is reasonable as an interim approach to use a De Minimis level that represents 4% of the 1-hr NO_2 and 1-hr SO_2 NAAQS.

The $PM_{2.5}$ De Minimis levels are EPA recommended De Minimis levels. The use of EPA recommended De Minimis levels is sufficient to conclude that a proposed source will not cause or contribute to a violation of a $PM_{2.5}$ NAAQS based on the analyses documented in EPA guidance and policy memorandums[4].

To evaluate secondary $PM_{2.5}$ impacts, the applicant provided an analysis based on a Tier 1 demonstration approach consistent with EPA's Guideline on Air Quality Models (GAQM). Specifically, the applicant used a Tier 1 demonstration tool

[2] www.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf

[3] www.tceq.texas.gov/assets/public/permitting/air/memos/guidance_1hr_no2naaqs.pdf

[4] www.tceq.texas.gov/permitting/air/modeling/epa-mod-guidance.html

developed by EPA referred to as Modeled Emission Rates for Precursors (MERPs). The basic idea behind MERPs is to use technically credible air quality modeling to relate precursor emissions and peak secondary pollutants impacts from a source. Using data associated with the worst-case source, the applicant estimated 24-hr and annual secondary $PM_{2.5}$ concentrations of 0.003 µg/m^3 and 0.0001 µg/m^3, respectively. Since the combined direct and secondary 24-hr and annual $PM_{2.5}$ impacts are above the De minimis levels, a full impacts analysis is required.

Table 3. Total Concentrations for Minor NSR NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax (µg/m^3)	Background (µg/m^3)	Total Conc. = [Background + GLCmax] (µg/m^3)	Standard (µg/m^3)
PM_{10}	24-hr	29	104	133	150
$PM_{2.5}$	24-hr	12	20	32	35
$PM_{2.5}$	Annual	0.14	8.8	8.94	9
Pb	3-mo	0.0004	0.07	0.0704	0.15
NO_2	1-hr	36	61	97	188

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

A background concentration for PM_{10} was obtained from EPA AIRS monitor 482450628 located at 6956 James Gamble Dr., Port Arthur, Jefferson County. The high, second high monitored concentration from 2021-2023 was used for the 24-hr value. The third quarter for 2023 monitoring data are incomplete. Since the monitoring data from the incomplete quarter for 2023 is comparable to the monitoring data from the same quarter for the previous years, using monitoring data from 2023 is reasonable. Also, ADMT reviewed the monitoring data and found that the value used by the applicant was conservative. The use of this monitor is reasonable based on the applicant's quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

Background concentrations for $PM_{2.5}$ were obtained from the EPA AIRS monitor 482450021 located at 2200 Jefferson Dr., Port Arthur, Jefferson County. The applicant calculated a three-year average (2021-2023) of the 98th percentile of the annual distribution of the 24-hr concentrations for the 24-hr value. The applicant calculated a three-year average (2021-2023) of the annual concentrations for the annual value. The use of this monitor is reasonable based on the applicant's

quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

A background concentration for NO_2 was obtained from the EPA AIRS monitor 482450628 located at 6956 James Gamble Dr., Port Arthur, Jefferson County. The three-year average (2021-2023) of the 98th percentile of the annual distribution of the daily maximum 1-hr concentrations was used for the 1-hr value. The third and the fourth quarter for 2023 monitoring data are incomplete. Since the monitoring data from incomplete quarters for 2023 is comparable to the monitoring data from the same quarters for the previous years, using monitoring data from 2023 is reasonable. The use of this monitor is reasonable based on the applicant's quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

A background concentration for Pb was obtained from the EPA AIRS monitor 480850029 at 7202 Stonebrook Parkway, Frisco, Collin County. The applicant used the maximum rolling three-month average over 2021-2023 for the 3-month value. The use of the monitor is reasonable based on the applicant's review of land use, county population, county emissions, and a quantitative review of emissions surrounding the area of the monitor site relative to the project site.

As stated above, to evaluate secondary $PM_{2.5}$ impacts, the applicant provided an analysis based on a Tier 1 demonstration approach consistent with EPA's GAQM. Specifically, the applicant used a Tier 1 demonstration tool developed by EPA referred to as MERPs. Using data associated with the worst-case source, the applicant estimated 24-hr and annual secondary $PM_{2.5}$ concentrations of 0.003 $\mu g/m^3$ and 0.0001 $\mu g/m^3$, respectively. When these estimates are added to the GLCmax listed in Table 3 above, the results are less than the NAAQS.

Table 4. Minor NSR Site-Wide Modeling Results for Health Effects

Pollutant	CAS#	Averaging Time	GLCmax (µg/m^3)	GLCmax Location	GLCni[5] (µg/m^3)	GLCni Location	ESL (µg/m^3)
asphalt	8052-42-4 (Vapor)	1-hr	397	S Property Line	317	85m N	350
asphalt	8052-42-4 (Vapor)	Annual	6	N property line	<6	-	35
asphalt	8052-42-4 (PM)	1-hr	2	S property line	<2	-	5
diesel fuel	68334-30-5	1-hr	773	260 NW	<773	-	1000

The GLCmax and the GLCni locations are listed in Table 4 above. The locations are listed by their approximate distance and direction from the property line of the project site.

[5] Ground level non-industrial concentration

3. Model Used and Modeling Techniques

ISC-PRIME (Version 04272) was used.

A. Land Use

Rural dispersion coefficients and elevated terrain were used in the modeling analysis. These selections are consistent with the topographic map, digital elevation models, and aerial photography.

B. Meteorological Data

Surface Station and ID: Port Arthur, TX (Station #: 12917)
Upper Air Station and ID: Lake Charles, TX (Station #: 3937)
Meteorological Dataset: 1988
Anemometer Height: 10 meters

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, area, and volume source parameters and rates were consistent with the modeling report. The source characterizations used to represent the sources were appropriate.

A NO_X to NO_2 conversion factor of 0.9, based on Ambient Ratio Method - 2, was applied to the modeled annual and 1-hr NO_X emission rates. This is reasonable.

A fugitive adjustment factor of 0.6 was applied to the modeled emission rates of applicable sources, which is consistent with TCEQ guidance for these types of sources.

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.