TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

December 5, 2022

Laurie Gharis, Chief Clerk
Texas Commission on Environmental Quality
P.O. Box 13087, MC 105
Austin, Texas 78711-3087

Re: Supplemental Backup Material for Commission's Consideration of Hearing Requests and Requests for Reconsideration
Exfluor Research Corporation
Permit No. 165848
TCEQ DOCKET NUMBER 2022-1552-AIR

Dear Ms. Gharis:

Enclosed please find a copy of the updated Air Quality Analysis Audit memorandum for inclusion in the background material for the above referenced permit application.

If you have any questions, please do not hesitate to call me at extension 6033 or Abigail Adkins at extension 2496.

Sincerely,

Betsy Peticolas
Staff Attorney
Environmental Law Division

Enclosures

TCEQ Interoffice Memorandum

To: Cara Hill
Mechanical/Coatings Section

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

From: Ahmed Omar, P.E.
ADMT

Date: December 5, 2022

Subject: Amended Air Quality Analysis Audit – Exfluor Research Corporation (RN110969227)

1. Project Identification Information

Permit Application Number: 165848
NSR Project Number: 331049
ADMT Project Number: 8329
County: Williamson
Published Map: \\tceq4avmgisdata\GISWRK\APD\MODEL PROJECTS\8329\8329.pdf

Air Quality Analysis: Submitted by Waid Environmental, October 2021, on behalf of Exfluor Research Corporation. Additional information was provided November 2021 and November 2022.

2. Report Summary

The air quality analysis is acceptable, as supplemented by the ADMT, for all review types and pollutants. The results are summarized below.

This modeling audit was updated for this NSR project number based on information provided by the applicant correcting its hydrogen fluoride analysis over agricultural areas using the 24-hr averaging time instead of the 1-hr averaging time. Additionally, while reviewing the updated information, the ADMT identified a discrepancy in the averaging time used for the long-term analysis for pollutants hydrogen fluoride, carbonyl fluoride, and trifluoroacetic acid over agricultural areas with cattle. The ADMT has evaluated the discrepancy and reported the results below. The update did not change the ADMT's conclusion that the air quality analysis is acceptable. This amended modeling audit memo represents a complete summary and supersedes the first modeling audit memo dated November 18, 2021 (WCC Content ID 5843027).

A. Minor Source NSR and Air Toxics Analysis

Table 1. Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
PM_{10}	24-hr	0.1	5
$PM_{2.5}$	24-hr	0.1	1.2

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
$PM_{2.5}$	Annual	0.01	0.2
NO_2	1-hr	7	7.5
NO_2	Annual	0.1	1
CO	1-hr	10	2000
CO	8-hr	3	500

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

Generic modeling was used for the above analyses; refer to section 3 for more details on the generic modeling.

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

The $PM_{2.5}$ De Minimis levels are the EPA recommended De Minimis levels. The use of the 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[2].

To evaluate secondary $PM_{2.5}$ impacts, the applicant provided an analysis based on a Tier 1 demonstration approach consistent with the EPA's Guideline on Air Quality Models. Specifically, the applicant used a Tier 1 demonstration tool developed by the EPA referred to as Modeled Emission Rates for Precursors (MERPs). The basic idea behind the 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 0.0001 µg/m^3 and <0.0001 µg/m^3, respectively. When these estimates are added to the GLCmax listed in the table above, the results are less than the De Minimis levels.

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

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

Table 2. Minor NSR Site-wide Modeling Results for Health Effects

Pollutant	CAS#	Averaging Time	GLCmax (µg/m^3)	GLCmax Location	GLCni (µg/m^3)	GLCni Location	ESL (µg/m^3)
hydrogen fluoride	7664-39-3	1-hr	6	-	<6	-	18
hydrogen fluoride | For air permit reviews in agricultural areas	7664-39-3	24-hr	1.1	-	-	-	3
hydrogen fluoride | For air permit reviews in agricultural areas with cattle	7664-39-3	30-days	0.46	-	-	-	0.75
fluorine	7782-41-4	1-hr	3.9	Western Property Line	3.9	Western Property Line	2
perfluoroheptane	335-57-9	1-hr	22	-	<22	-	20000
methanol	67-56-1	1-hr	38	-	<38	-	3900
perfluorooctanoic acid and its inorganic salts	335-67-1	1-hr	<0.01	-	<0.01	-	0.05
bromine	7726-95-6	1-hr	5	-	<5	-	7
hydrogen chloride	7647-01-0	1-hr	4	-	<4	-	190
hydrogen chloride	7647-01-0	Annual	0.1	-	<0.1	-	7.9
carbon tetrafluoride	75-73-0	1-hr	154		<154	-	18000
Perfluoro (bis-2-chloroethoxy methane)	Not found	1-hr	7	-	<7	-	200
Perfluorodecalin	306-94-5	1-hr	22	-	<22	-	200
polymers of chlorotrifluoroethylene (PCTFE)	9002-83-9	1-hr	17	-	<17	-	50

Pollutant	CAS#	Averaging Time	GLCmax (µg/m^3)	GLCmax Location	GLCni (µg/m^3)	GLCni Location	ESL (µg/m^3)
carbonyl fluoride | For air permit reviews in agricultural areas with cattle	353-50-4	30-days	0.24	-	<0.03	-	0.71
trifluoroacetic acid | For air permit reviews in agricultural areas with cattle	76-05-1	30-days	0.27	-	<0.03	-	0.71

Table 3. Minor NSR Hours of Exceedance for Health Effects

Pollutant	Averaging Time	1 X ESL GLCni
fluorine	1-hr	99

For fluorine, the GLCmax and the GLCni are the same. Pollutant-specific modeling was conducted for fluorine. For all other pollutants and averaging times, generic modeling was used; refer to section 3 for more details on the generic modeling.

The applicant evaluated the long-term hydrogen fluoride, carbonyl fluoride, and trifluoroacetic acid analyses over agricultural areas with cattle based on the annual averaging time instead of the 30-day averaging time. For carbonyl fluoride and trifluoroacetic acid analyses over agricultural areas with cattle, the ADMT used 24-hr unit impact multipliers (UIMs) to evaluate the 30-day averaging times, which is conservative. The 24-hr results are less than the 30-day ESLs and will not affect overall conclusions. For the hydrogen fluoride analysis over agricultural areas with cattle, the ADMT conducted modeling using the 30-day averaging time. The 30-day results are less than the ESL and will not affect overall conclusions. The ADMT supplemented the long-term results for these three analyses in Table 2 above.

3. Model Used and Modeling Techniques

AERMOD (Version 21112) was used in a refined screening mode.

A unitized emission rate of 1 lb/hr was used to predict a generic short-term and long-term impact for each source. The generic impact was multiplied by the proposed pollutant specific emission rates to calculate a maximum predicted concentration for each source. The maximum predicted concentration for each source was summed to get a total predicted concentration for each pollutant. Pollutant-specific modeling was conducted for fluorine.

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.

B. Meteorological Data

Surface Station and ID: Austin, TX (Station #: 13904)
Upper Air Station and ID: Fort Worth, TX (Station #: 3990)
Meteorological Dataset: 2016
Profile Base Elevation: 150.9 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 and volume source parameters and rates were consistent with the modeling report. The source characterizations used to represent the sources were appropriate.

The applicant assumed full conversion of NO_x to NO_2, which is conservative.

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.