BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
	)	R 23-18(A)
AMENDMENTS TO 35 ILL. ADM. CODE	)	(Rulemaking – Air)
PARTS 201, 202, AND 212	)	

NOTICE OF FILING

TO: Mr. Don A. Brown,
Clerk of the Board
Illinois Pollution Control Board
100 West Randolph Street,
Suite 11-500
Chicago, Illinois 60601

Timothy Fox
Chloe Salk
Hearing Officers
Illinois Pollution Control Board
60 East Van Buren Street, Suite 630
Chicago, Illinois 60605

(SEE PERSONS ON ATTACHED SERVICE LIST)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board, the **FIRST POST-HEARING COMMENT** on behalf of the American Petroleum Institute, copies of which, are hereby served upon you.

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

By: **/s/** Alec Messina
One of its Attorneys

Dated: October 18, 2023

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CERTIFICATE OF SERVICE

I, the undersigned, on oath state the following: That I have served the attached **FIRST POST-HEARING COMMENT of the AMERICAN PETROLEUM INSTITUTE,** via electronic mail upon:

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That my email address is Alec.Messina@heplerbroom.com

That the number of pages in the email transmission is 23.

That the email transmission took place before 5:00 p.m. on October 18, 2023.

Date: October 18, 2023

/s/ Alec Messina
Alec Messina

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	**)**	
	)	
AMENDMENTS TO 35 ILL. ADM. CODE	**)**	**R 23-18(A)**
PARTS 201, 202, AND 212	**)**	**(Rulemaking – Air)**

FIRST POST-HEARING COMMENT OF THE
AMERICAN PETROLEUM INSTITUTE

NOW COMES Petitioner, the AMERICAN PETROLEUM INSTITUTE ("API"), by and through its undersigned attorney, hereby submits to the Illinois Pollution Control Board ("Board") its First Post-Hearing Comment in this sub-docket rulemaking.

Proposed Revisions to Rule Language

On September 20, 2023, the Hearing Officer entered an Order in this sub-docket, which included the Board's pre-filed questions to the participants of the proceeding. In the first pre-filed question, the Board asked participants whether they had any concerns regarding the non-substantive revisions to the proposed amendments shown in Attachment A to the pre-filed questions. Attachment, Hearing Officer Order, PCB R 23-18(A) at 1 (Sept. 20, 2023). In relation to API's proposal, the Board proposed revisions to 35 Ill. Adm. Code 216.103, 216.104, and 216.361. API has no concerns regarding the Board's proposed revisions to these sections.

Furthermore, at the First Hearing in this matter, the Board requested that API respond to the Joint Committee on Administrative Rules' ("JCAR") questions filed with the Board on September 7, 2023. Transcript of First Hearing, PCB R 23-18(A) at 77:14-20 (Sept. 27, 2023); *see* Public Comment #2, PCB R 23-18(A) (Sept. 7, 2023). API does not object to JCAR's proposed changes to 35 Ill. Adm. Code 216.104 or 216.361.

Monitoring Data

On September 20, 2023, the Attorney General's Office ("AGO") filed pre-filed questions directed to witnesses at the First Hearing in this sub-docket. The AGO filed a number of pre-filed questions directed at API. At the First Hearing, API's witness, John Derek Reese, provided responses to the AGO's pre-filed questions. As to the AGO's pre-filed question #5 directed to API, the AGO requested the date and time of each of the five FCCU startups at the Marathon refinery during calendar years 2017-2019. Mr. Reese provided that information at the First Hearing; however, for convenience, API is hereby again submitting the information:

Startup Begins	Startup Complete
1/7/2018 01:45	1/8/2018 07:30
2/17/2019 23:00	2/18/2019 16:45
4/4/2019 17:30	4/5/2019 4:30
6/6/2019 13:30	6/7/2019 0:30
12/8/2019 15:30	12/9/2019 12:00

The AGO's pre-filed question #6 to API requested that API "provide all monitoring data available from the two monitoring stations from the dates of the five FCCU startups at the Marathon refinery during calendar years 2017 through 2019." As explained by Mr. Reese at the First Hearing, Marathon's two monitoring stations monitored carbon monoxide ("CO"), nitrogen dioxide ("NO_2"), total reduced sulfur ("TRS"), PM_{10}, and volatile organic compounds ("VOC"). Testimony of John Derek Reese, First Hearing Transcript, PCB R 23-18(A) at 66:8-11 (Sep. 27, 2023).[1] API hereby provides, attached as Exhibit 1 hereto, excerpts from Marathon's Completion Report prepared pursuant to the Consent Order, which includes summary CO data from Marathon's monitoring stations from 2017 through 2019. API objects to the AGO's request to provide

[1] Simultaneous with this Post-Hearing Comment, API is filing a Motion for Correction of the transcript of the First Hearing, correcting several typographical errors relating to Mr. Reese's testimony.

monitoring data related to emissions from other pollutants as such information is not relevant to API's proposal in this sub-docket. API's proposal proposes amendments to Part 216 of the Board's regulations, which govern CO emissions. Specifically, API's proposal concerns amendments to 35 Ill. Adm. Code 216.361, which provides CO emission standards for petroleum and petrochemical processes. Emissions of other pollutants are therefore not relevant to API's proposal.

Modeling Data

At the First Hearing in this sub-docket, the AGO requested that API submit more detail about the AERMOD screening that ExxonMobil performed, including the inputs and more detail on the results. First Hearing Transcript, PCB R 23-18(A) at 76:8-22 (Sep. 27, 2023). API hereby submits, as Exhibit 2 hereto, additional information concerning the CO dispersion modeling performed at the ExxonMobil refinery.

WHEREFORE, for the above and foregoing reasons, the American Petroleum Institute hereby respectfully submits its First Post-Hearing Comment for the Illinois Pollution Control Board's consideration.

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

Dated: October 18, 2023

By: /s/ *Alec Messina*
One of Its Attorneys

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Table 2-5: CO Highest and Second Highest Averages For January 1, 2017 - December 31, 2017			
Monitoring Site	**Highest Hourly Average, Date(s) and Time(s) of Occurrence**	**2nd Highest Hourly Average, Date(s) and Time(s) of Occurrence**	**Max 8-Hour Running Average, Date(s) and Time(s) of Occurrence**
Site #1	**0.8 ppm** 8/1/17 10AM	**0.7 ppm** Refer to Data Listings	**0.6 ppm** 12/3/17 12AM, 2AM
Site #2	**1.2 ppm** 2/1/17 8AM	**1.0 ppm** 5/30/17 7PM	**0.5 ppm** Refer to Data Listings
CO Highest and Second Highest Averages For January 1, 2018 - December 31, 2018			
Monitoring Site	**Highest Hourly Average, Date(s) and Time(s) of Occurrence**	**2nd Highest Hourly Average, Date(s) and Time(s) of Occurrence**	**Max 8-Hour Running Average, Date(s) and Time(s) of Occurrence**
Site #1	**0.8 ppm** 12/12/18 4PM	**0.7 ppm** 10/19/18 11AM,1PM, 12/12/18 7PM	**0.5 ppm** Refer to Data Listings
Site #2	**1.3 ppm** 1/17/18 7AM	**1.1 ppm** 1/17/18 6AM, 1/28/18 6AM, 12/17/18 5AM	**0.8 ppm** 1/13/18 8PM, 9PM
CO Highest and Second Highest Averages For January 1, 2019 - December 31, 2019			
Monitoring Site	**Highest Hourly Average, Date(s) and Time(s) of Occurrence**	**2nd Highest Hourly Average, Date(s) and Time(s) of Occurrence**	**Max 8-Hour Running Average, Date(s) and Time(s) of Occurrence**
Site #1	**1.8 ppm** 11/10/19 10PM	**1.7 ppm** 11/11/19 12AM	**1.2 ppm** 11/11/19 1AM,4AM-5AM
Site #2	**0.9 ppm** Refer to Data Listings	**0.8 ppm** 4/2/19 4AM, 8/1/19 7AM	**0.6 ppm** 3/18/19 6AM-8AM

EXHIBIT 1

Table 4-7: 2017 CO 1-Point Quality Control Checks: Site #1			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
1/6/17	4.5	4.6	2.22
1/13/17	4.5	4.6	2.22
1/20/17	4.5	4.5	0.00
1/27/17	4.5	4.4	-2.22
2/3/17	4.5	4.4	-2.22
2/10/17	4.5	4.3	-4.44
2/17/17	4.5	4.4	-2.22
2/23/17	4.5	4.3	-4.44
2/23/17	5.0	5.1	2.00
2/24/17	4.5	4.6	2.22
3/3/17	4.5	4.4	-2.22
3/10/17	4.5	4.4	-2.22
3/12/17	4.5	4.3	-4.44
3/12/17	5.0	5.0	0.00
3/17/17	4.5	4.5	0.00
3/24/17	4.5	4.4	-2.22
3/31/17	4.5	4.4	-2.22
Absolute Value of Mean Percent Differences (AB)		**2.21**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**1.36**	
Precision (CV%)		**3.08**	
Signed Bias (%)		**-2.79**	
Upper 95% Probability Limit		**3.42**	
Lower 95% Probability Limit		**-5.80**	

Table 4-7: 2017 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
4/7/17	4.5	4.3	-4.44
4/14/17	4.5	4.4	-2.22
4/21/17	4.5	4.2	-6.67
4/21/17	4.5	4.2	-6.67
4/21/17	6.9	6.9	0.00
4/28/17	4.5	4.4	-2.22
5/5/17	4.5	4.5	0.00
5/12/17	4.5	4.7	4.44
5/19/17	4.5	4.4	-2.22
5/26/17	4.5	4.5	0.00
5/30/17	4.5	4.4	-2.22
5/30/17	5.0	5.1	2.00
6/2/17	4.5	4.8	6.67
6/9/17	4.5	4.8	6.67
6/16/17	4.5	4.7	4.44
6/23/17	4.5	4.6	2.22
6/30/17	4.5	4.6	2.22
Absolute Value of Mean Percent Differences (AB)		**3.26**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**2.38**	
Precision (CV%)		**5.39**	
Signed Bias (%)		**±4.26**	
Upper 95% Probability Limit		**8.18**	
Lower 95% Probability Limit		**-7.94**	

Table 4-7: 2017 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
7/7/17	4.5	4.6	2.22
7/14/17	4.5	4.4	-2.22
7/21/17	4.5	4.3	-4.44
7/28/17	4.5	4.3	-4.44
7/28/17	4.5	4.2	-6.67
7/28/17	5.0	5.2	4.00
8/4/17	4.5	4.8	6.67
8/11/17	4.5	4.7	4.44
8/18/17	4.5	4.5	0.00
8/25/17	4.5	4.5	0.00
9/1/17	4.5	4.5	0.00
9/8/17	4.5	4.3	-4.44
9/11/17	5.0	5.2	4.00
9/15/17	4.5	4.7	4.44
9/22/17	4.5	4.7	4.44
9/29/17	4.5	4.7	4.44
Absolute Value of Mean Percent Differences (AB)		**3.56**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**2.11**	
Precision (CV%)		**5.51**	
Signed Bias (%)		**±4.48**	
Upper 95% Probability Limit		**8.93**	
Lower 95% Probability Limit		**-7.37**	

Table 4-7: 2017 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
10/6/17	4.5	4.6	2.22
10/13/17	4.5	4.7	4.44
10/20/17	4.5	4.7	4.44
11/3/17	4.5	4.7	4.44
11/10/17	4.5	4.4	-2.22
11/17/17	4.5	4.5	0.00
11/24/17	4.5	4.5	0.00
12/1/17	4.5	4.5	0.00
12/8/17	4.5	4.4	-2.22
12/15/17	4.5	4.5	0.00
12/22/17	4.5	4.5	0.00
12/29/17	4.5	4.5	0.00
Absolute Value of Mean Percent Differences (AB)		**1.67**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**1.93**	
Precision (CV%)		**3.38**	
Signed Bias (%)		**+2.66**	
Upper 95% Probability Limit		**5.65**	
Lower 95% Probability Limit		**-3.79**	

Table 4-8: 2018 CO 1-Point Quality Control Checks: Site #1			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
1/5/18	4.5	4.5	0.00
1/12/18	4.5	4.5	0.00
1/19/18	4.5	4.5	0.00
1/26/18	4.5	4.5	0.00
2/2/18	4.5	4.5	0.00
2/9/18	4.5	4.5	0.00
2/16/18	4.5	4.5	0.00
2/23/18	4.5	4.5	0.00
3/2/18	4.5	4.4	-2.22
3/9/18	4.5	4.4	-2.22
3/16/18	4.5	4.4	-2.22
3/22/18	7.3	7.3	0.00
3/22/18	7.3	7.4	1.37
3/23/18	4.5	4.6	2.22
3/30/18	4.5	4.5	0.00
Absolute Value of Mean Percent Differences (AB)		**0.68**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**1.02**	
Precision (CV%)		**1.64**	
Signed Bias (%)		**±1.15**	
Upper 95% Probability Limit		**2.20**	
Lower 95% Probability Limit		**-2.61**	

Table 4-8: 2018 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
4/6/18	4.5	4.5	0.00
4/13/18	4.5	4.5	0.00
4/20/18	4.5	4.5	0.00
4/27/18	4.5	4.5	0.00
5/4/18	4.5	4.4	-2.22
5/11/18	4.5	4.4	-2.22
5/18/18	4.5	4.2	-6.67
5/25/18	4.5	4.3	-4.44
5/30/18	7.3	7.3	0.00
5/30/18	7.3	7.6	4.11
6/1/18	4.5	4.4	-2.22
6/8/18	4.5	4.4	-2.22
6/15/18	4.5	4.4	-2.22
6/22/18	4.5	4.3	-4.44
6/29/18	4.5	4.3	-4.44
Absolute Value of Mean Percent Differences (AB)		**2.35**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**2.11**	
Precision (CV%)		**3.52**	
Signed Bias (%)		**-3.31**	
Upper 95% Probability Limit		**3.35**	
Lower 95% Probability Limit		**-6.95**	

Table 4-8: 2018 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
7/6/18	4.5	4.4	-2.22
7/13/18	4.5	4.3	-4.44
7/20/18	4.5	4.2	-6.67
7/23/18	7.3	7.1	-2.74
7/23/18	7.3	7.4	1.37
7/27/18	4.5	4.5	0.00
8/3/18	4.5	4.5	0.00
8/10/18	4.5	4.5	0.00
8/17/18	4.5	4.5	0.00
8/24/18	4.5	4.4	-2.22
8/31/18	4.5	4.6	2.22
9/7/18	4.5	4.4	-2.22
9/7/18	7.3	7.3	0.00
9/14/18	4.5	4.4	-2.22
9/21/18	4.5	4.5	0.00
9/28/18	4.5	4.4	-2.22
Absolute Value of Mean Percent Differences (AB)		**1.79**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**1.87**	
Precision (CV%)		**2.96**	
Signed Bias (%)		**-2.60**	
Upper 95% Probability Limit		**3.04**	
Lower 95% Probability Limit		**-5.71**	

Table 4-8: 2018 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
10/5/18	4.5	4.3	-4.44
10/9/18	4.5	4.3	-4.44
10/9/18	4.5	4.6	2.22
10/12/18	4.5	4.6	2.22
10/15/18	4.5	4.5	0.00
10/18/18	7.3	7.4	1.37
10/18/18	7.6	7.8	2.63
10/22/18	4.5	4.6	2.22
10/29/18	4.5	4.7	4.44
11/5/18	4.5	4.7	4.44
11/12/18	4.5	4.7	4.44
11/19/18	4.5	4.6	2.22
11/26/18	4.5	4.6	2.22
12/3/18	4.5	4.6	2.22
12/10/18	4.5	4.9	8.89
12/17/18	4.5	4.6	2.22
12/24/18	4.5	4.8	6.67
12/31/18	4.5	4.6	2.22
Absolute Value of Mean Percent Differences (AB)		**3.31**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**2.08**	
Precision (CV%)		**4.15**	
Signed Bias (%)		**+4.16**	
Upper 95% Probability Limit		**8.58**	
Lower 95% Probability Limit		**-3.94**	

Table 4-9: 2019 CO 1-Point Quality Control Checks: Site #1			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
1/7/19	4.5	4.7	4.44
1/14/19	4.5	4.6	2.22
1/21/19	4.5	4.7	4.44
1/28/19	4.5	4.7	4.44
1/31/19	4.5	4.8	6.67
1/31/19	4.5	4.4	-2.22
2/4/19	4.5	4.3	-4.44
2/11/19	4.5	4.4	-2.22
2/18/19	4.5	4.3	-4.44
2/25/19	4.5	4.2	-6.67
3/4/19	4.5	4.3	-4.44
3/11/19	4.5	4.7	4.44
3/18/19	4.5	4.6	2.22
3/25/19	4.5	4.4	-2.22
Absolute Value of Mean Percent Differences (AB)		**3.97**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**1.55**	
Precision (CV%)		**5.98**	
Signed Bias (%)		**±4.7**	
Upper 95% Probability Limit		**8.78**	
Lower 95% Probability Limit		**-8.46**	

Table 4-9: 2019 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
4/1/19	4.5	4.4	-2.22
4/8/19	4.5	4.2	-6.67
4/15/19	4.5	4.3	-4.44
4/22/19	4.5	4.3	-4.44
4/30/19	7.5	7.3	-2.67
4/30/19	7.5	7.5	0.00
5/6/19	4.5	4.4	-2.22
5/13/19	4.5	4.3	-4.44
5/20/19	4.5	4.2	-6.67
6/3/19	4.5	4.2	-6.67
6/10/19	4.5	4.2	-6.67
6/17/19	4.5	4.3	-4.44
6/24/19	4.5	4.5	0.00
Absolute Value of Mean Percent Differences (AB)		**3.97**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**2.40**	
Precision (CV%)		**3.32**	
Signed Bias (%)		**-5.15**	
Upper 95% Probability Limit		**0.74**	
Lower 95% Probability Limit		**-8.68**	

Table 4-9: 2019 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
7/1/19	4.5	4.6	2.22
7/8/19	4.5	4.7	4.44
7/15/19	4.5	4.8	6.67
7/15/19	7.5	7.7	2.67
7/15/19	7.5	7.3	-2.67
7/22/19	4.5	4.4	-2.22
7/29/19	4.5	4.5	0.00
8/5/19	4.5	4.4	-2.22
8/12/19	4.5	4.6	2.22
8/19/19	4.5	4.6	2.22
8/26/19	4.5	4.7	4.44
9/2/19	4.5	4.7	4.44
9/5/19	7.5	7.6	1.33
9/5/19	7.5	7.4	-1.33
9/9/19	4.5	4.4	-2.22
9/16/19	4.5	4.3	-4.44
9/23/19	4.5	4.4	-2.22
9/24/19	4.5	4.4	-2.22
Absolute Value of Mean Percent Differences (AB)		**2.79**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**1.55**	
Precision (CV%)		**4.15**	
Signed Bias (%)		**±3.42**	
Upper 95% Probability Limit		**6.69**	
Lower 95% Probability Limit		**-5.65**	

Table 4-9: 2019 CO 1-Point Quality Control Checks: Site #1 (continued)			
Date	**Known Concentration (ppb)**	**DAS-Indicated Concentration (ppb)**	**Percent Difference (Δ %)**
10/7/19	4.5	4.5	0.00
10/14/19	4.5	4.5	0.00
10/21/19	4.5	4.5	0.00
10/28/19	4.5	4.6	2.22
11/4/19	4.5	4.5	0.00
11/11/19	4.5	4.7	4.44
11/12/19	7.5	7.5	0.00
11/12/19	7.5	7.3	-2.67
11/18/19	4.5	4.4	-2.22
11/25/19	4.5	4.5	0.00
12/2/19	4.5	4.4	-2.22
12/9/19	4.5	4.5	0.00
12/16/19	4.5	4.5	0.00
12/23/19	4.5	4.6	2.22
12/30/19	4.5	4.5	0.00
Absolute Value of Mean Percent Differences (AB)		**1.07**	
Standard Deviation of Absolute Value of Mean Percent Differences (AS)		**1.45**	
Precision (CV%)		**2.44**	
Signed Bias (%)		**±1.73**	
Upper 95% Probability Limit		**3.69**	
Lower 95% Probability Limit		**-3.45**	

EXHIBIT 2

MEMORANDUM

To: **Brad Sims and Terry Cirbo, ExxonMobil Oil Corporation**

From: **Jim Donaldson and Reshawn George, Trinity Consultants, Inc.**

Date: **October 13, 2023**

RE: **Carbon Monoxide Dispersion Modeling for the FCC Unit**

Trinity Consultants, Inc. (Trinity) performed in early July of this year a dispersion modeling analysis for emissions of carbon monoxide (CO) from the fluidized catalytic cracking unit (FCC Unit) at the ExxonMobil Oil Corporation (ExxonMobil) refinery near Joliet, Illinois (Joliet facility) to determine conservatively the ground level concentrations of CO at various emission rates during startup conditions for comparison to the national ambient air quality standards (NAAQS). As described below, based on model results, emissions during startup operations of ExxonMobil's FCC Unit do not cause an exceedance of the CO NAAQS.

The following methodology and conditions were used in the dispersion model:

The current U.S. EPA regulatory model, AERMOD (version 22112) was used, as incorporated within Trinity's *BREEZE™ AERMOD Pro* software, in conjunction with the following guidance documents:

- U.S. EPA's *Guideline on Air Quality Models* 40 CFR 51, Appendix W (Revised, January 17, 2017);
- U.S. EPA's *AERMOD Implementation Guide* (Revised August 2019); and
- U.S. EPA's *New Source Review Workshop Manual* (Draft, October 1990);

The Building Profile Input Program (BPIP) with Plume Rise Model Enhancements (PRIME) (version 04274) was used to determine the building downwash characteristics for each stack;
In all modeling input and output files, the locations of the emission source, structures, and receptors were represented in the Universal Transverse Mercator (UTM) coordinate system in UTM Zone 16;
All model objects were defined in the North American Datum of 1983 (NAD83);
Trinity used a variable-density, circular Cartesian receptor grid to determine the extent of the significant impact area (SIA):

- Property line receptors with a spacing of 50 meters
- 100-meter spacing, extending from the property line to approximately 4,000 meters from the facility center
- 500-meter spacing, from 4,000 meters to approximately 6,500 meters from the facility center
- 1,000-meter spacing, from 6,500 meters to approximately 15,000 meters from the facility center
- 2,500-meter spacing, from 15,000 meters to approximately 50,000 meters from the facility center

The terrain elevation for each receptor point, emission source, and structure was determined using the AERMOD terrain processor, AERMAP (version 18081);
The meteorological data used for this modeling demonstration were obtained from the Midway International Airport, located in Chicago, IL.

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- In 2017, there is a significant amount of missing met data between June and September. Therefore, the data were pre-processed for AERMOD using AERMET (version 19191) for the years 2012 through 2016, as recommended by Jeff Sprague of Illinois EPA in a May 18, 2020 email to ExxonMobil.
- One-minute wind data were processed using the AERMINUTE program (version 15272) and input to AERMET (version 19191)
- The regulatory default ADJ_U* option was selected in AERMET

The FCC Unit was modeled at an emission rate of 2,000 ppm, which represents maximum CO concentrations under past startup conditions measured by the unit's continuous emission monitoring system (CEMS) as reported to agencies in periodic compliance reports.

- The FCC Unit stack was modeled at its height of 250 feet, diameter of 14 feet, average temperature of 141 °F, and maximum flow rate of 69 feet per second, resulting in a CO emission rate of 4,902 pounds per hour

The maximum modeled ground level impacts for CO under these conditions are shown in the table below:

CO Modeled Concentration	Averaging Period	Maximum impact (ppm)*	NAAQS (ppm)	Percent of NAAQS	Max Receptor UTM Easting (m)	Max Receptor UTM Northing (m)
2,000 ppm	1-hr	0.94	35	2.69%	401700	4586300
	8-hr	0.49	9	5.39%	401300	4586500

*Summary model results attached. AERMOD outputs are in terms of $\mu g/m^3$, aproximately 1,165 x the value of CO in terms of ppm

Based on these modeled results, operation of the FCC during startup conditions is not expected to cause an exceedance of the CO NAAQS.

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MEMORANDUM

Figure 1 – Summary of Highest 1-Hour Results

```
                                   ** CONC OF CO       IN MICROGRAMS/M**3                          **

                                                               DATE                                                           NETWORK
GROUP ID                                  AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL      HIGH   1ST HIGH VALUE IS    1095.43296  ON 12080307: AT (  401700.00,  4586300.00,   164.03,   164.03,   0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
? *** AERMOD - VERSION 22112  ***   ***  ExxonMobil - Joliet, Illinois                                        ***        09/22/23
 *** AERMET - VERSION  19191 ***   ***  CO Modeling - Year 2012-2016                                          ***        17:34:51
                                                                                                                         PAGE 179
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  RURAL  ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           3 Warning Message(s)
 A Total of         352 Informational Message(s)

 A Total of       43848 Hours Were Processed

 A Total of          86 Calm Hours Identified

 A Total of         266 Missing Hours Identified (  0.61 Percent)

    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***

    ********   WARNING MESSAGES   ********
 ME W186    7188       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used          0.50
 ME W187    7188       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET
 OU W565    7194       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT     PLOTFILE

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

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MEMORANDUM

Figure 2 – Summary of Highest 8-Hour Results

```
                                  ** CONC OF CO       IN MICROGRAMS/M**3                          **

                                                           DATE                                                          NETWORK
GROUP ID                                  AVERAGE CONC    (YYMMDDHH)           RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL      HIGH   1ST HIGH VALUE IS     565.23515  ON 12102516: AT (  401300.00,  4586500.00,    159.02,    159.02,     0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
? *** AERMOD - VERSION 22112  ***   ***  ExxonMobil - Joliet, Illinois                                     ***       09/22/23
 *** AERMET - VERSION  19191 ***   ***  CO Modeling - Year 2012-2016                                       ***       17:46:51
                                                                                                                     PAGE 179
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  RURAL  ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of          0 Fatal Error Message(s)
 A Total of          3 Warning Message(s)
 A Total of        352 Informational Message(s)

 A Total of      43848 Hours Were Processed

 A Total of         86 Calm Hours Identified

 A Total of        266 Missing Hours Identified (  0.61 Percent)

    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***

    ********   WARNING MESSAGES   ********
 ME W186    7188       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used          0.50
 ME W187    7188       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET
 OU W565    7194       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT     PLOTFILE

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

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