



City of Albuquerque

Environmental Health Department

Air Quality Program



Modeling Waiver Review

August 9, 2024

To: Permit File

From: Kyle Tumpane, Senior Environmental Health Scientist

Subject: Modeling Waiver Request Review for American Gypsum, Permit #0752-M4
Modification

The Air Quality Program (AQP) has completed a review of the modeling waiver request submitted on July 16, 2024 for the American Gypsum facility located at 4600 Paseo Del Norte NE, Albuquerque, NM.

Background:

A pre-application meeting was held with American Gypsum and Trinity Consultants on July 2, 2024 to discuss a modification to their air quality construction permit #0752-M4. American Gypsum explained that adjustments are needed to the CO emissions for the new vertical roller mill's hot gas generator and baghouse (Unit DC-11) because an incorrect burner was provided by the manufacturer and installed with Unit DC-11. American Gypsum is working with the burner manufacturer, Honeywell, to modify or replace the burner that was installed. Despite this issue, several emissions guarantees were received by American Gypsum from Honeywell: the size of the burner will remain the same 51.2 MMBtu/hr as currently permitted and there will therefore be no changes to the PM, VOC or SO₂ emissions; there are no changes to the NO_x emissions based on the same emissions guarantee. The only emission rate that is changing due to this incorrect burner is CO, which will increase from 2.12 lb/hr to 16.2 lb/hr. American Gypsum's consultant, Trinity, states that the last modeling done for American Gypsum's permit #0752-M4 showed that both 1-hour and 8-hour CO were below the significant impact levels (SILs). Trinity then argues that these modeled impacts can be scaled using the previously modeled emission rate and the updated emission rate for Unit DC-11 to show that the impact of the updated CO emission rate will still be below the SILs.

However, there are some issues with the statements made, and the values provided, by Trinity. There is a little confusion regarding for which permit modeling was completed based on the information in the modeling waiver request and this should be cleared up. According to the response on page 3 of the modeling waiver request form, full modeling was completed with the application for the current permit issued on March 11, 2022 and Table 1 on page 1 of the form represents these impacts as being from modeling for permit #0752-M4. The permit issued on March 11, 2022 was permit #0752-M3, which did have full modeling submitted with the application but is not the current permit. The modeled impacts submitted as part of the permit #0752-M3 3rd updated application submittal on May 19, 2021, which was the accepted submittal, are very close but do not exactly match the impacts in Table 1, although the percent of significance level values are the same when truncated to one decimal place. The values in Table 1 match the modeled impacts in the original 0752-M3 submittal on November 23, 2020, which was ruled incomplete. The application for permit #0752-M4, submitted on February 27, 2023, included a modeling waiver

request and waiver approval from January 6, 2023. This waiver request was approved for an increase in the annual throughput for the gypsum stockpile that affected the ton/year emissions for Units 12a and 12b but did not alter the hourly emission rates. Current permit #0752-M4 was issued on November 17, 2023 as stated on the first page of the modeling waiver request, so it is unclear why there are confusing answers provided in other parts of this waiver request. Trinity states at the bottom of page 1, and in Table 2 on page 2, that the scaled and modeled percentages they provide are percentages of the ambient air quality standards. This is incorrect. The scaled and modeled percentages provided by Trinity are percentages of the SILs. If the values provided by Trinity were percentages of the standards, some values would exceed the SILs. For example, 6.88% of the 8-hour CO standard, 9967 $\mu\text{g}/\text{m}^3$, would be 685.73 $\mu\text{g}/\text{m}^3$, which would be above the SIL of 500 $\mu\text{g}/\text{m}^3$.

This modeling waiver request submitted by Trinity for the increase in CO emissions from Unit DC-11 failed to account for the change to ambient modeled stack temperatures for DC-11, DC-12 and DC-13 that AQP tested in August – September 2023 as part of the 0752-M4 review, which led to higher modeled impacts. The previous two permits, 0752-M3 and 0752-M3-1TR, included permit conditions requiring stack temperatures of at least 327°F for DC-11, DC-12 and DC-13. American Gypsum requested that these permit conditions be changed during 0752-M4 review because the baghouses operate at ambient temperature. American Gypsum stated that the 327°F temperature is the maximum temperature the baghouses can handle, that temperature was inadvertently given to Trinity as the operating temperature for modeling, and the bags would melt if operated at that temperature. DC-11 is the only one of these three units with CO emissions so the increase in modeled CO impacts observed in the 0752-M4 AQP modeling is due to the decreased stack temperature for this unit.

The table below shows the modeled impacts, percent of SIL, modeled and proposed emission rates, and the scaled percent of SIL impact for Unit DC-11 as presented in the submitted modeling waiver request. The table also shows the values found and calculated by AQP for two submittals for permit #0752-M3 and the AQP modeling results for permit #0752-M4. AQP added the scaled impacts in $\mu\text{g}/\text{m}^3$ for the three sets of values that AQP calculated. The modeled impacts and percent of SIL values were multiplied by the scaling factor ($16.2/2.12 = 7.64$) to get the scaled impact values. These results show that Trinity appears to have over-estimated the scaled percent of SIL impact for 1-hour CO and under-estimated the scaled percent of SIL impact for 8-hour CO based on comparison to the values for the two 0752-M3 submittals. The difference in the 8-hour CO scaled percent of SIL impact is due to Trinity using the truncated 0.9% of SIL value. It is unclear how Trinity reached the 1-hour CO scaled percent of SIL impact value of 2.99%. When using the truncated 0.3% of SIL value, the AQP gets a 1-hour CO scaled percent of SIL impact value of 2.29%.

Modeling Document	Pollutant/Averaging Period	Significant Impact Level ($\mu\text{g}/\text{m}^3$)	Modeled Impact ($\mu\text{g}/\text{m}^3$)	Percent of SIL	Modeled Emission Rate (lb/hr)	Proposed Emission Rate (lb/hr)	Scaled Impact ($\mu\text{g}/\text{m}^3$)	Scaled Impact (% of SIL)						
This Waiver Request	1-hr CO	2000	6.97841	0.3%	2.12	16.2	-	2.99%						
	8-hr CO	500	4.74039	0.9%			-	6.88%						
0752-M3 11/23/2020 Submittal	1-hr CO	2000	6.97841	0.349%			2.12	16.2	53.32	2.67%				
	8-hr CO	500	4.74039	0.948%					36.22	7.24%				
0752-M3 05/19/2021 Submittal	1-hr CO	2000	6.98326	0.349%					2.12	16.2	53.35	2.67%		
	8-hr CO	500	4.65072	0.930%							35.53	7.11%		
0752-M4 AQP Modeling	1-hr CO	2000	81.8	4.09%							2.12	16.2	624.95	31.25%
	8-hr CO	500	58.3	11.66%									445.41	89.08%

The modeled CO impacts from the 0752-M4 AQP modeling are significantly higher than the impacts submitted by Trinity in either 0752-M3 modeling demonstration and in this modeling waiver request due to the decrease to ambient stack exit temperature for Unit DC-11, as discussed above. However, the scaled impact and scaled percent of SIL impact values both show that American Gypsum will remain below the SILs for the 1-hour and 8-hour CO standards.

On August 6, 2024 AQP requested documentation for the emissions guarantee from Honeywell that American Gypsum/Trinity referenced in the modeling waiver request to support the claim that none of the pollutants other than CO will have emission rate increases. American Gypsum provided a one-page summary of the emissions guarantee for NO_x and CO from Honeywell on August 6, 2024. The document referred to an attached emissions statement so AQP requested the pages that were attached to this summary page. A partial screenshot of the requested page was provided by Trinity so AQP again requested the full document. Trinity provided the full page on August 6, 2024 so AQP could continue this review. The documents from Honeywell provided by American Gypsum and Trinity do indeed state emission guarantees of less than 2.46 lb/hr for NO_x and less than 16.2 lb/hr for CO. The other pollutants are not specifically mentioned with any sort of emissions guarantee in the documents from Honeywell. However, the permitted hourly VOC, SO₂ and PM emissions were calculated using AP-42 emission factors and the system firing rate of 51.2 MMBtu/hr so those emissions should not change if the firing rate stays the same, and the 51.2 MMBtu/hr system firing rate is listed on the emissions guarantee document.

Recommendation:

The argument regarding the use of scaled modeled impacts for CO emissions is reasonable overall. Modeled impacts in AERMOD can generally be scaled when the only thing changing is the emission rate. The modeled and scaled impacts are significantly higher than those presented by Trinity when the ambient stack exit temperature for DC-11 from the 0752-M4 AQP modeling is taken into account. However, the impacts are still below the SILs for the 1-hour and 8-hour CO standards. The AQP wanted to be sure the modeled impacts matched the calculated scaled results so a quick test CO model was run with the emissions of all CO-emitting units scaled by the same 7.64 factor as DC-11 and the results were very close matches to the calculated scaled results. When a test CO model was run with only the DC-11 emissions increased, the modeled impacts were quite a bit lower than the scaled impacts. This indicates that scaling impacts is an acceptable and conservative approach, especially when the emissions from only one unit are increasing.

It is recommended that a modeling waiver be granted for both 1-hour and 8-hour CO for Unit DC-11. A modeling waiver is not required for other pollutants, averaging periods or emission units because none of those emissions are changing.