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December 20, 2024

Katie Eagleson
Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232

Re: Response to DEQ request for information dated November 25, 2024

Dear Katie:

On behalf of Mutual Materials Company (Mutual Materials), Maul Foster & Alongi (MFA) is providing this response to your letter dated November 25, 2024 (the Letter) in which the Department of Environmental Quality (DEQ) requested additional information as well as changes to Mutual Materials' air toxics emissions inventory. The Letter states that Mutual Materials must submit responses to the Letter and an updated Cleaner Air Oregon (CAO) emissions inventory no later than December 20, 2024.

This response is organized in the same manner as the information was requested in the Letter. The Letter comments are shown in bold followed by the response. MFA has prepared a revised version of the CAO emissions inventory included as Attachment A. MFA has updated the AQ520 form and will provide it and the Excel version of the background calculations electronically to the DEQ.

1. **Total fired brick throughput: Please provide the following information regarding the throughput data provided in the AQ520 form for the yearly and daily values:**

    a. **Yearly throughput:**

        i. **The current permit uses 25,500 tons of brick fired per year to calculate the potential to emit from KILN_TK. The AQ520 form lists 25,000 tons of brick fired per year as the total throughput for KILN_TK. Please revise the AQ520 form to align with the current permitted value or substantiate the discrepancy;**

    b. **Daily maximum throughput:**

        i. **In DEQ's meeting with the facility on November 6, 2024, it was discussed that the daily throughput for the KILN_TK is limited to the capacity of the brick dryer. Please confirm the daily throughput values listed in the AQ520 form are an accurate estimate of the actual and maximum daily throughput given the current process configuration.**

Mutual Materials' permitted potential-to-emit (PTE) was set at 25,500 tons of brick fired per year based on an initial estimate of the capacity of the tunnel kiln, however, there is a process limitation (bottleneck) in the production sequence that makes 25,500 tons/year operationally unachievable. The maximum actual daily and annual production Mutual Materials has achieved is 61.0 tons of fired brick/day and 22,469 tons of fired brick/year. Mutual Materials has determined that the dryer system cannot adequately dry clay at production levels above 65.0 tons/day or 22,500 tons/year and would need major upgrades to achieve production above those levels. Therefore, Mutual Materials is using a production capacity of 65.0 tons/day and 22,500 tons/yr. The emissions

inventory and AQ520 have been updated to reflect the requested PTE and the facility is willing to accept these production limits as a CAO permit condition.

ii. **Please include an actual and maximum daily throughput value for the kiln drying of clay bricks without the manganese surface treatment (KILN_TK) in the AQ520 form. DEQ understands the intent is to only model the more conservative risk scenario with emissions calculated assuming production of bricks with the manganese surface treatment.**

The highest estimated theoretical risk from operation will be associated with clay treated with manganese. Therefore, the risk assessment will be conducted assuming that all of the daily PTE production rate (65.0 tons/day) will be attributed to clay treated with manganese. AQ520 has been revised to include the actual daily throughput value of 61.0 tons/day for both clay without manganese treatment and clay with manganese treatment. The intent of this change is to show that Mutual Materials has fired either all clay with manganese additives, or all clay without manganese additives in one day. However, the total maximum daily throughput value for kiln drying of clay bricks is 65.0 tons/day.

c. **Consistency in throughput recordkeeping:**

i. **The production rate listed in the 2023 Air Toxics Emissions Inventory is inconsistent with the rate listed in the 2023 Annual Report and the AQ520 form. Please provide an explanation for how material throughput is tracked and the possible reason for this discrepancy.**

Mutual Materials tracks all material throughput based on standardized brick weights and dimensions. Clay brick enters the kiln on cars, and the weight of each car is recorded according to the standard weights of the clay bricks, and the number of bricks on the cart. Mutual Materials reported 19,360 tons of fired brick per year in the 2023 Air Toxics Emissions Inventory, 2023 Annual Report, and the AQ520 form.

2. **Missing TACs from additive SDS's: Update the AQ520 form to either include the missing Toxic Air Contaminants (TACs) or revise the mass fraction of TACs listed in the SDS's for the materials listed below; alternatively, provide information supporting that these should be excluded or that the current mass fractions are accurate:**

a. **KILN_M - Magna K: Missing the listed manganese (CASRN 7439-96-5) percentage of 36 to 46%;**

b. **KILN_BX - Brickox: Missing the listed manganese dioxide (CASRN 7439-96-5) percentage of 90 to 100% and the phosphorus (CASRN 7723-14-0) percentage of <= 1%, which should be reported as the mass of manganese and phosphorus, respectively;**

c. **KILN_GB - Gerstley Borate: Missing the listed manganese oxide percentage of 0.024%, which should be reported as the mass of manganese; and**

d. **KILN_IONR - Red Iron Oxide NR: The quartz (CASRN 14808-60-7) percentage listed in the SDS is 1% to 5%, but it is included in the AQ520 form and Table 4 of the supplementary document for the Inventory as 20%. This TAC has been correctly identified as crystalline silica (CASRN 7631-86-9) in the Inventory.**

MFA calculated manganese emissions from the tunnel kiln using the emission factors from AP-42 Chapter 11.3 (August,1997), Table 11.3-2, Emission Factors for Metal Emissions from Brick Manufacturing Operations. Based on production records, 54 percent of all clay bricks that Mutual Materials produces include additives containing manganese. MFA used the AP-42 emission factor for natural gas-fired kilns firing a product with manganese surface treatment to calculate manganese emissions from 54 percent of total production (TEU KILN_TKM). This emission factor accounts for the manganese content in the additives. Adding emissions based on the manganese constituents in the kiln additives would be double counting manganese emissions from the tunnel kiln.

AQ520 and the background calculations in Appendix A have been updated to include the phosphorus content of Brickox, and the silica percentage in Red Iron Oxide NR has been corrected to 3 percent. The aluminum oxide content in Manga K, Brickox, Gestley Borate, and Red Iron Oxide NR was updated to be reported as the mass of aluminum.

3. **Missing chromium emission factor for silos: Revise the AQ520 form to include the total chromium (CASRN 18540-29-9) emission factor of 2.90 x 10-8 lb/ton from AP-42 Table 11.12-8, listed in Table 6 of the supplementary document for the Inventory, for TEUs SILO_1 through SILO_10.**

AQ520 has been updated to include total chromium as hexavalent chromium (CAS 18540-29-9) for TEUs SILO_1 through SILO_10, but this is a highly conservative estimate, and we do not expect hexavalent chromium from silo operations. Although high temperature kilns can oxidize the chromium present in raw materials and contribute to the formation of hexavalent chromium in the final cement product, Mutual Materials does not kiln dry any cement products. The sand delivered to the site is never heated to temperatures that could form hexavalent chromium.

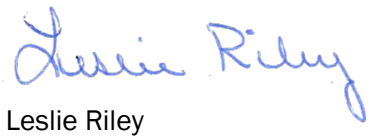
4. **Cement mixing activities: AP-42 Section 11.12 Concrete Batching provides emission factors for central mix batching and several other emissions sources associated with concrete batch mixing, but only silo filling emissions are included in the AQ520 form. Please provide more detailed information on the potential emissions from the cement mixing process, including a discussion on the development of the daily and yearly throughputs for SILO_1 through SILO_10.**

Annual and maximum daily PTE production were based on the capacity of the operation. Mutual Materials does not use any mold release agents or kiln dry any concrete product. Sand and aggregate arrive at the site with a high moisture content so there are negligible particulate emissions upon delivery. Cement is delivered by an outside tank truck and is pneumatically conveyed through a 5-inch pipe to the mix area inside the building. All cement mixing and batching operations take place in a fully enclosed area within the building with no path to atmosphere for particulate emissions.

Thank you for working with us throughout this process. Please contact Joe Taff at JTaff@mutualmaterials.com or Leslie Riley at LRiley@maulfoster.com if there are any questions or comments about the information being provided.

Sincerely,

Maul Foster & Alongi, Inc.



Leslie Riley
Senior Air Quality Specialist

## Attachment

A— Emissions Inventory (REV 12.20.24) pdf

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