



October 31, 2023

Mr. Balaji Vaidyanathan  
Facility Emission Control Value Stream Manager  
Arizona Department of Environmental Quality  
1110 W. Washington Street  
Phoenix, Arizona 85007

RE: Copper World Project – Class II Air Quality Control Permit Application No. 96659 – Response to the Comprehensive Request for Additional Information dated August 10, 2023.

Dear Mr. Vaidyanathan

This letter transmits responses to the Comprehensive Request for Additional Information issued to Copper World, Inc. (Copper World) for the Copper World Project (Project) by the Arizona Department of Environmental Quality (ADEQ) on August 10, 2023. An application for a Class II Air Quality Control Permit was submitted to ADEQ on October 21, 2022, for the Project. ADEQ issued a Comprehensive Request for Additional Information Letter to Copper World on May 2, 2023. On May 30, 2023, Copper World submitted an information package that contained responses to all six (6) categorized requests in ADEQ's May 2, 2023, letter. Per ADEQ's August 10, 2023, letter, the six (6) categorized requests required additional information.

This letter provides responses to these requests along with any required supporting documentation.

These requests are repeated below along with responses. Responses are either embedded entirely in this letter or summarized with details provided in a separate attachment. Additionally, a single compiled document is not provided due to size.

As per the August 10, 2023 ADEQ letter, items are categorized as follows:

- Ore and Waste Rock Hauling
- Blasting Modeling Methodology
- Modeled Emissions Rates Verification
- Sensitivity Analysis
- Helvetia Road
- Ambient Air Boundary

## 1. Ore and Waste Rock Hauling

- a. Revised emissions calculation methodology for calculating haul road emissions such that emissions for each unpaved road segment are calculated based on throughput of material mined and hauled, haul truck capacity, and 2-way haul road length for each road segment rather than allocating total emissions based on the annual weighted average hauling distance over the length of each road segment. Ensure that the haul road lengths used for emissions calculations are consistent with the modeled haul road lengths.

*Response: For each modeled mine life year (Year 2, Year 8 and Year 14), the updated emissions inventories include a revised methodology for calculating emissions associated with in-pit and out of pit ore and waste rock material hauling. For out of pit ore and waste rock hauling, the emissions are calculated utilizing the out of pit haul route length based on the calculated haul route as depicted within the AERMOD mine layout for each modeled mine life year. This calculation is included in the emissions inventory for review by ADEQ. The emissions inventories have been updated to account for the revision in haul road lengths and to calculate the Vehicle Miles Traveled (VMT) and resultant haul road surface emissions. This calculation is based on the haul road length multiplied by the number of trucks that travel the route in a given time period (1-hr, 24-hr and annually). The truck trips are based on the amount of material movement on that route divided by the truck capacity and the size of the haul truck fleet allocated to that route. The individual haul road volume source emissions rates are based on the aggregated activity (emissions) that will occur on each haul road segment as defined by each hauling process (ore to crusher, ore to heap leach pad and waste rock to waste rock facility).*

- b. Revised methodology for the allocation of tailpipe emissions from haul truck operations to ensure that tail pipe emissions from haul trucks are not solely allocated within the Broadtop Butte and Rosemont pits, and instead are appropriately allocated across the haul roads, pits, and waste rock facilities.

*Response: The allocation of tailpipe emissions from haul truck operations has been revised to account for the appropriate residence time of the haul truck fleet inside the pits and out of the pits on the haul road network. In order to allocate the haul truck tailpipe emissions, the emissions were separated between the pits based on the number of trucks allocated to each pit. The relative percentage of emissions allocated to the in-pit area and the out of pit haul road network were then allocated based on the ratio of in-pit and out of pit haul VMTs as a surrogate for residence time in each location within the haulage network. The allocation of these emissions totals onto the various haul road segments was then ratioed based on distance traveled along each haul road segment. In this manner they were aggregated into the haul route volume sources by location as was completed for the roadway emissions.*

- c. Revised starting point of “Combined Haul Road 1-2” in Model Year 8 to the intersection of “BT Haul Road” and “Combined Haul Road 7-8.”

*Response: The starting point for the Combined Haul Road 1-2 in Model Year 8 has been updated to occur at the intersection of the BT Haul Road and the Combined Haul Road 7-8. This methodology has also been updated or confirmed for each modeled mine life year to account for the appropriate junction point at each haul road segment.*

- d. Justification for the allocation of 35% of in-pit hauling emissions and 10% of mobile equipment emissions from Broadtop Butte Pit to “BT Haul Road” rather than modeling all in-pit emissions associated with the Broadtop Butte Pit as a single open-pit source.

*Response: The revised hauling emissions quantification no longer makes use of a percent separation of in-pit hauling emissions for allocation to the “BT Haul Road”. The revised methodology quantifies out of pit hauling based on the BT Haul Road length being included as part of the out of pit haul road distance for each type of material being hauled (crusher ore, heap leach ore and waste rock). The in-pit emissions are based on the amount*

of in-pit hauling based on the updated mine plan estimates. The in-pit hauling distance is based on the travel distance starting within the mine pit for each type of material mined and traveling to the commencement of the out of pit haul road (in this case, BT Haul Road).

- e. Verification that waste rock will not be hauled to tailings storage facilities or used for the construction of the buttress for the proposed tailings storage facilities, and removal of references to these operations from the emissions inventories.

*Response: It is confirmed that no waste rock will be hauled to the tailing storage facilities for use in constructing buttresses of the proposed tailings storage facilities. The emissions associated with these activities have been removed from the modeled mine year emissions inventories. The percentage of material hauled for this process was left in the inventory tab of the emissions inventories with a zero percent entry to confirm that it is not included in the emissions quantification.*

## **2. Blasting Modeling Methodology**

- a. Revised methodology for modeling blasting emissions such that blasting volume sources are concentrated into a single area within the pit when demonstrating compliance with the 1-hour and 24-hour National Ambient Air Quality Standards rather than allocating blasting volume sources across the pit.

*Response: For each modeled mine life year, the modeled blasting volume sources have been updated to be concentrated into a single area adjacent to the edge of the modeled mine pit. For Year 8 and Year 14, this was completed in keeping with the locations proposed by ADEQ. For Year 2, the same method was utilized with placement of the sources adjacent to the nearest ambient boundary.*

- b. Revised methodology for modeling blasting emissions such that the area of the blasting volume sources is consistent with the surface areas used to develop emissions calculations.

*Response: For each modeled mine life year, the model blasting volume sources in the dispersion model have been updated to calculate the combined surface area of all six (6) blasting sources to be consistent with the surface area used to calculate particulate emissions in the emissions inventory. In addition, to ensure consistency with the anticipated plume dimensions associated with the tonnage of ANFO included in the emissions inventory, the OBODM model was executed to calculate the updated vertical dimensions of the blasting volume sources for each modeled mine year and pit location.*

### 3. Modeled Emissions Rates Verification

- a. Validation of modeled emission rates for open-pit sources for all model years.

*Response: The revised emissions inventories resulted in updates to the open pit source modeled emissions rates for each modeled mine life year. The revised emissions inventories have been confirmed to match the emissions rate modeled for each open pit source based on the mine life year and mine pit.*

- b. Validation of modeled emission rates for wind erosion from the run of mine stockpile (Model Source ID: PC01).

*Response: The modeled emissions rates for all modeled mine plan years have been reviewed against the updated emissions inventories. This includes confirmation that the model source for the run of mine stockpile (Model Source ID: PC01) matches each of the updated emissions inventories.*

- c. Justification for the use of a NO<sub>2</sub>/NO<sub>x</sub> in-stack ratio of 0.05 for emissions of NO<sub>2</sub> from the sulfuric acid plant and fire water pump.

*Response: The in-stack ratios for both the sulfuric acid plant and the fire water pump have been revised in the updated modeling to utilize the EPA default value of 0.5 to ensure a conservative assessment of NO<sub>2</sub> impacts. This value has been defined by the EPA as appropriate for use without further justification.*

- d. Identification of the following modeled emission sources in the emissions inventories: WHMOBV, CUMOMOBV, TRKMOBV, and CDRMOBV.

*Response: The modeled emissions inventories for each modeled mine life year have been updated to identify the emissions associated with WHMOBV, CUMOMOBV, TRKMOBV, and CDRMOBV. These are now labeled on the "Source Allocation" tab with their corresponding long name, i.e., Plant Area – Warehouse is now labeled as WHMOBV Plant Area – Warehouse to ensure clarity.*

### 4. Sensitivity Analysis

- a. Revised sensitivity analysis to evaluate sensitivity of meteorological variables for Model Year 8 of the revised model rather than Model Year 14 of the initial submittal.

*Response: The meteorological sensitivity analyses for each meteorological revision have been updated to utilize the Year 8 24-hr PM<sub>10</sub> analysis as their basis. The resubmission associated with this data request includes the updated modeling files.*

- b. Revised sensitivity analysis methodology ensuring consistency with the methodology outlined in Table 5-1 of the modeling report.

*Response: Updates to the following AERMET meteorological sensitivity analyses were completed to ensure compliance with Table 5-1 of the modeling report.*

*1. The previous ADEQ submission adjusted the surface temperature in both surface and upper air datafiles; the revised submission includes reprocessing of only the surface temperature in the surface file and does not amend the upper air surface temperature.*

2. The previous submission adjusted cloud cover in all months of the year; the revised submission includes reprocessing to only adjust the cloud cover during the months of July, August and September and include no cloud cover adjustment for the remaining months.

**5. Helvetia Road**

- a. Emissions calculations for delivery and product shipment associated with the Copper World Project on Helvetia Road for parcels owned by Copper World, Inc.

*Response: The revised emissions inventories for each modeled mine plan year include emissions calculated for delivery and product shipment associated with the Copper World Project on Helvetia Road (referred to in the emissions inventory and model as Santa Rita Road) for parcels owned by Copper World, Inc. This includes traffic from the primary mine guard house to the exit of the parcels owned by Copper World, Inc. traveling to the west. Product and delivery traffic traveling north of the mine guard house is not anticipated to occur on a routine basis.*

- b. Revised model accounting for emissions from delivery and product shipment associated with the Copper World Project on Helvetia Road for all model years.

*Response: The revised modeling files provided for each modeled mine life year include area sources along Helvetia Road (referred to in the emissions inventory and model as Santa Rita Road) accounting for emissions calculated for delivery and product shipment associated with the Copper World Project. The revised area sources have roadway receptors placed on both sides of the roadway at a distance of one (1) meter from each side of the area source.*

**6. Ambient Air Boundary Items**

- a. Confirmation that the following parcels are to be included in the footprint of the Rosemont pit: 30560012D, 30560012F, and 30560012G.

*Response: It is confirmed that parcels 30560012D, 30560012F, and 30560012G are controlled by Copper World, Inc. and should be included in the Rosemont Pit.*

- b. Removal of the portion of parcel number 30561007M included in the footprint of the Rosemont pit.

*Response: The revised modeling files provided for each modeled mine life year include the removal of parcel number 30561007M from the footprint of the Rosemont pit and the ambient air boundary.*

The model report plus Section 2.0 and Section 4.0 of the application have been updated and are provided as attachments to this response letter.

Please do not hesitate to contact me at (520) 495-3527 (office), (520) 260-3490 (cell) or via e-mail at [david.krizek@hudsonbayminerals.com](mailto:david.krizek@hudsonbayminerals.com) if you have any questions regarding this response.

Sincerely,

A handwritten signature in black ink that reads "David Krizek". The signature is written in a cursive, flowing style.

David Krizek, P.E.

Senior Manager, Environmental & Permitting

Attachments:

Attachment 1: Revised AERMOD Modeling Report. Project Report. Copper World Project. October 2023.

Attachment 2: Revised Section 2, Section 4 and Appendix A, B, C and F of the October 21, 2022 "ADEQ CLASS II PERMIT – Permit Application"

*Doc. No. 054/23-15.5.7.2*