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MEMORANDUM

DATE:	2021-03-26	RWDI Reference No.:	2103192
TO:	[REDACTED]	EMAIL:	[REDACTED]
FROM:	Melissa Annett	EMAIL:	Melissa.Annett@rwdi.com
RE:	Peer Review of Documents Prepared by Pinchin Ltd. Entegris Air Quality Peer Review Toronto, Ontario		

Dear [REDACTED]

RWDI was retained by the residents of West Hill, Highland Creek, Centennial and West Rouge to complete a peer review of the Emission Summary and Dispersion Modelling (ESDM) Report and associated modelling files prepared by Pinchin Ltd. for the Entegris Canada Ltd. facility, located at 470 Coronation Drive in Toronto, Ontario. RWDI reviewed the aforementioned documents to determine whether the information provided is complete and prepared to Ministry of the Environment, Conservation and Parks (MECP) standards and current industry standards. The following documents were reviewed:

- Final Emission Summary and Dispersion Modelling Report for Entegris Canada Ltd. dated November 3, 2020, prepared by Pinchin Ltd., “the ESDM”; and,
- Current AERMOD & BPIP modelling files, with file modification dates of October 30, 2020, prepared by Pinchin Ltd., “the model”.

In addition to the above documents, the following were also considered in RWDI’s peer review:

- Ontario Regulation 419/05, Local Air Quality. (Reg. 419);
- MECP Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report, version 4.1, March 2018. (Guideline A10);
- MECP Guideline A-11: Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report, version 3.0, February 2017. (Guideline A11); and,
- Air Contaminants Benchmarks (ACB) List: Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants, version 2.0, April 2018. (ACB List)



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KEY CONCERNS

Process emissions from the air treatment system are calculated using the ideal gas law; the initial emissions are then adjusted to take into account the control efficiencies of the thermal oxidizer and scrubber, as provided by the equipment manufacturer. However, the ESDM report does not include sufficient detail to validate that the emissions were calculated correctly using this methodology. Detailed sample calculations outlining how the initial emission rate was calculated (prior to the application of controls) should be provided. In particular, details regarding the volumetric displacement of nitrogen considered in the equation, as well as the number of reactors, are needed.

The description of the emission calculation indicates that the number of reactors is a required variable in the equation; however, throughout the report there are numerous references to other equipment and operations that are also ducted through the air treatment system, including material transfer operations, filtration, distillation, holding tanks, etc. Details of how the contribution from these sources were considered in the emission calculation is required. If not all sources of emissions to the treatment system were considered, the emissions may be underestimated.

Emissions from “Specific Future Processing” were simply listed as “Provided by Entegris” and could not be validated. Detailed sample calculations and supporting information should be provided.

Emissions from by-products of combustion from the thermal oxidizer should have detailed sample calculations, including details on how the total aggregate emissions were calculated and the molecular weights used for conversion.

Overall, the calculation of process emissions does not have sufficient information provided to allow us to understand details on the process or the calculations involved so we cannot agree that the conclusions of the report are valid.

ADDITIONAL FINDINGS

In addition, the following items are more minor in nature, but they should be clarified or confirmed.

- Maintenance welding is listed in Table A1 as an insignificant source; however, the required supporting information to validate this assessment (as listed in Table B-3B of Guideline A10) was not provided;
- The Fitzmill Grinding Mill is listed in Table A1 as an insignificant source; however, grinding operations would be expected to emit particulate matter. Further detail supporting this classification should be provided;



- There are three identical stacks located on the rooftop in the location indicated for Boiler B1. Please confirm that only one boiler is present;
- Natural gas emergency generator for fire pump emissions were calculated incorrectly, using output rather than fuel input, as required by the emission factor used. The emission calculation should be updated;
- Natural gas combustion emissions from the thermal oxidizer were calculated based on a maximum heat input of 1.4 million BTU/hr; equipment specifications indicate a maximum capacity of 1.6 million BTU/hr. The emission calculation should be updated;
- Exhausts PE_1 to PE_3 are stated to collect fugitive emissions from the reaction and filtration vessels in the laboratory room operations. The report later states that all reaction vessels are within a closed system. If fugitive emissions are expected from these sources, they should be quantified; otherwise the wording should be clarified;
- The calculation of cleaning emissions were generally based on the capacity of the largest reactor vessel in a given area. However, some areas have equipment with larger capacities, such as holding tanks. Confirmation should be provided that the most conservative cleaning scenario has been assessed or the emission calculations should be updated;
- The dispersion modelling includes one small penthouse on the western side of the building that is not shown in Figure B2 or B3 of the ESDM and is also not visible on available aerial images of the facility. This should be updated;
- In the dispersion model, the base heights of the sources vary by up to 3 meters. The model should be updated with consistent base heights; and,
- The ESDM report included contaminants without ACB list benchmarks that had predicted concentrations greater than the de minimis concentration, as well as one contaminant with a predicted concentration about its B2 benchmark. These contaminants were correctly submitted to the MECP for review, but no documentation has been provided to indicate whether the MECP accepted these levels. It is our understanding that this file is still under review at the MECP.



RWDI#2103192
MARCH 26, 2021

CONCLUSIONS

RWDI reviewed the ESDM report and associated dispersion modelling to determine whether the information provided is complete and prepared to current MECP and industry standards. In general, the approach followed current MECP and industry standards; however, there are several areas where more detail or revisions are required before a formal conclusion can be reached.

Yours truly,

RWDI AIR Inc.

A handwritten signature in black ink, appearing to read 'Melissa Annett'.

Melissa Annett, d.E.T.

Senior Project Manager, Principal

A handwritten signature in black ink, appearing to read 'Brian Sulley'.

Brian Sulley, B.A.Sc., P.Eng.

Technical Director – Air Quality, Principal

A handwritten signature in black ink, appearing to read 'Sarah Pellatt'.

Sarah Pellatt, B.Sc.

Senior Air Quality Scientist MEA/BGS/SJP/hta