INTERNATIONAL WAXES, INC.

1100 East Main Street • Titusville, Pennsylvania, USA. 16354 • Tel: (814) 827-4900 • Fax (814) 827-2363 • www.igiwax.com

45 Route 446 • Smethport, Pennsylvania, USA. 16749 • Tel (814) 887-5501 • Fax: (814) 887-4049 • www.igiwax.com

December 30, 2022

Dave Balog
Environmental Engineer Manager
Air Quality Program
Pennsylvania Department of Environmental Protection
Northwest Regional Office
230 Chestnut Street
Meadville, PA 16335

Re: PA Code Title 25, Sections 129.111 – 129.115 – Additional RACT Requirements for Major Sources of NOx and VOCs for the 2015 Ozone NAAQS
International Waxes, Inc.
Farmers Valley Plant
Smethport, Pennsylvania

Dear Mr. Balog:

International Waxes, Inc. (IWI) has evaluated additional Reasonably Available Control Technology Requirements (RACT) for major sources of nitrogen oxides (NOx) and volatile organic compounds (VOCs) for the 2015 Ozone National Ambient Air Quality Standards (NAAQS), as codified in 25 PA Code 129.111-129.115, for our Smethport, Pennsylvania facility (known as Farmers Valley).

An updated applicability evaluation in accordance with 25 PA Code 129.111, 129.112, and 112.114 is presented in Attachments 1 and 2 to this correspondence for NOx and VOC emission sources, respectively. Note that these attachments also satisfy the notification requirements of 25 PA Code 129.115(a).

The outcome of this evaluation is as follows:

- All NOx sources (Attachment 1) fall into presumptive RACT, except for Boiler 6 and the Resin Heater. Boiler 6 is considered a new source and not subject to RACT III, as it began operations on April 16, 2019 (after the regulatory threshold date of August 3, 2018). It is subject to more stringent best available control technology (BACT) requirements. The Resin

Heater is exempt from additional NOx RACT for the 2015 NAAQS based on a potential to emit (PTE) < 1 ton per year (tpy).

- All VOC sources (Attachment 2), except for Wastewater Treatment Plant (Source ID 300) and Flue Gas Holder (Source ID 303), either have existing RACT requirements, presumptive RACT requirements, or are exempt from additional VOC RACT for the 2015 NAAQS based on PTE <1 tpy.

Note that the potential to emit for each emission source identified in Attachments 1 and 2 was recently reviewed with the PADEP and updated accordingly in December 2021 / January 2022 as part of the technical review and issuance of IWI's Title V Operating Permit #42-00011 renewal.

IWI prepared an alternative RACT analyses for the Wastewater Treatment Plant and Flue Gas Holder in October 2016 under RACT II provisions, in accordance with 25 PA Code 129.99. This exercise resulted in add-on technologies that were either technically infeasible or cost prohibitive to implement. The following work practice conditions were accepted by the PADEP for each subject emission source and incorporated into a modification to Title V Operating Permit #42-00011, effective February 21, 2020, and also carried forward into the renewal to Title V Operating Permit #42-00011, effective February 24, 2022:

Flue Gas Holder: 1) The flue gas holder shall be operated in accordance with manufacturer/facility specifications and good engineering practices; 2) A positive pressure nitrogen blanket shall be maintained on the flue gas holder at all times, to minimize volatilization of organic compounds.

Wastewater Treatment Plant: Any floating product (i.e., wax) shall be routinely skimmed from the wastewater treatment plant API separators, and the skimmed material shall be returned to the production process.

Because both emission sources of interest have not had any significant changes to operations, emission levels, or other site or source-specific factors analyzed during the determination for these source's RACT II evaluations in 2016, IWI is eligible to prepare a reduced analysis for the Flue Gas Holder and Wastewater Treatment Plant in place of a full case-by-case analysis in accordance with 25 PA Code 129.114(i). This analysis is presented in the following sections below.

Technology Analysis

Available control technologies for the two processes and their pollutants referenced above was revisited to determine if there were any new or upgraded technologies available for emission control. The RACT II analysis reviewed the potential use of recuperative and regenerative thermal oxidation, catalytic oxidation, wet scrubbing, vapor condensation/recovery, and carbon adsorption. Technologies considered to be technically infeasible were: wet scrubbing (due to the insoluble nature of the pollutants in wet scrubber absorption material, such as water); carbon adsorption (due to the

flammability nature and hot spot formation of ketones in carbon); and vapor condensation (due to the extremely low concentrations of pollutants in the air stream and the intensely high energy that would be needed to condense the pollutants, such as through refrigeration). Of the oxidation processes, recuperative was not further considered due to its high energy cost (in comparison to thermal). Catalytic was not further considered due to its low pollutant concentrations, and the possibility of the wax (contained in the emissions) masking of the catalyst. Therefore, thermal oxidation was reviewed and updated. No new thermal oxidation technologies were found other than those considered in the previous RACT II analysis, therefore, it was updated for cost (where necessary).

Flue Gas Holder – 25 PA Code 129.114(i) Analysis

The Flue Gas Holder is an inverted tank (8 ft. diameter) that floats in a reservoir of water with an exposed surface area to atmosphere of 13 ft^2. The Flue Gas Holder receives VOCs (mainly MEK and toluene) lost to the Flue Gas System, including VOCs from the MEK unit and from the flue gas blanket on MEK/Toluene storage tanks. Any VOCs not emitted to atmosphere are pressure relieved to a blowdown tank.

In accordance with the requirements of 25 PA Code 129.114(i), IWI reports the following for the Flue Gas Holder:

1. Upon review, IWI has determined that there is no new VOC air cleaning device, air pollution control technology, or technique available for application to the Flue Gas Holder at the time of submittal of this analysis, as discussed above.

2. For the previous RACT requirements regulated under 25 PA Code 129.96-129.100 (known as RACT II), IWI identified thermal oxidation and carbon adsorption as available VOC control technologies for the Flue Gas Holder. Carbon adsorption was dismissed as technically infeasible for application to this emission source, as methyl ethyl ketone (MEK) is present in the waste stream. MEK is not a good candidate for candidate for application to carbon adsorption because ketones and other classes of chemicals build up heat that may cause hot spots in the carbon bed. If the flow through the carbon stops and oxygen infuses in the carbon, this may pose a fire hazard (i.e., a fire may start if the temperature reaches the auto ignition temperature of the vapor and oxygen is present to support ignition). Due to this high safety concern, carbon adsorption was considered to be technically infeasible for this application. Thermal oxidation was considered technically feasible and, therefore, IWI provided an economic feasibility analysis for this technology.

3. The economic analysis for thermal oxidation application for the Flue Gas Holder under RACT II resulted in a VOC cost effectiveness of $12,090 / ton VOC removed. This did not include consideration costs of the necessity to enclose the Flue Gas Holder as part of the implementation, as this is essentially an open fugitive source. Therefore, the cost effectiveness would have realistically been higher at the time of evaluation. Regardless, the

economic feasibility of thermal oxidation application to the Flue Gas Holder under RACT II exceeds the $12,000 / ton VOC removed screening level identified in 25 PA Code 129.114(i)(1)(i).

4. The previously identified technical and economic feasibility analysis was approved by the PADEP, resulting in the work practice standards that are currently permitted. Considering higher labor rates and utility rates for present day, as well as additional costs for implementation of an enclosure, an updated cost effectiveness would be greater than the $12,090 / ton VOC removed determined for RACT II.

Based on this requisite analysis for the Flue Gas Holder and considering a RACT III cost-effectiveness benchmark for presumptive VOC RACT of $7,500 IWI concludes that the RACT II case-by-case determination for the 1997 and 2008 8-hr ozone NAAAS remains RACT for the 2015 8-hr ozone NAAQS.

Wastewater Treatment Plant – 25 PA Code 129.114(i) Analysis

The Wastewater Treatment Plant at IWI is in the form of two parallel API Separators with interior dimensions of 58 ft. long x 8 ft. wide x 8.5 ft. deep each. Average flow through the API Separators is 400,000 – 500,000 gallons per day (gpd), with a design flow of 700,000 gpd. Organic content at the wastewater treatment plant consists of toluene, methyl ethyl ketone (MEK), and naphtha. Organics / oils on the surface are removed via skimming equipment and further control of organics occurs inherently via gravity separation technology. Any organics not evaporated are directed to Slop Tank #75, where they are used as an ingredient for IWI's Crude Unit.

In accordance with the requirements of 25 PA Code 129.114(i), IWI reports the following for the Wastewater Treatment Plant:

1. Upon review, IWI has determined that there is no new VOC air cleaning device, air pollution control technology, or technique available for application to the Wastewater Treatment Plant at the time of submittal of this analysis, as discussed above. This includes a review of USEPA's RACT, BACT, LAER Clearinghouse (RBLC) database. IWI previously considered an API separator cover (fixed and/or floating) in conjunction with thermal oxidation and carbon adsorption as available VOC control technologies under RACT II.

2. For the previous RACT II requirements regulated under 25 PA Code 129.96-129.100, IWI identified a separator cover system, thermal oxidation, and carbon adsorption as available VOC control technologies for the Wastewater Treatment Plant. Based on the known wastewater constituents consisting of naphtha, toluene, and MEK (all of which are flammable), the vapors could reach concentration levels above the UEL. Therefore, for this application,

there is a need for an inert gas blanket and purge, or just a purge to a downstream secondary treatment device (thermal oxidization or carbon adsorption). Carbon adsorption was dismissed as technically infeasible for application to this emission source based on the presence of MEK wastewater stream and for similar reasons as discussed above for application of carbon adsorption for the Flue Gas Holder. A separator cover system and thermal oxidation were considered technically feasible and, therefore, IWI provided an economic feasibility analysis for these combined technologies.

3. The economic analysis for a separator cover system / thermal oxidation application for the Wastewater Treatment Plant under RACT II resulted in a VOC cost effectiveness of $8,952 / ton VOC removed, which was found to be cost prohibitive. The previously identified technical and economic feasibility analysis was approved by the PADEP, resulting in the work practice standards that are currently permitted. However, the cost effectiveness of a separator cover system / thermal oxidation application to the Wastewater Treatment Plant under RACT II is less than the $12,000 / ton VOC removed screening level identified in 25 PA Code 129.114(i)(1)(ii), which prompts a new / updated economic feasibility analysis.

4. IWI has prepared an updated economic analysis for the technically feasible control technologies for VOCs at the Wastewater Treatment Plant. IWI received an updated quote for the separator cover system and continued to base thermal oxidation capital costs on an average of $30 / cfm. Labor and utility rates have been updated as part of annual operating costs. Overall, the economic analysis was conducted with reference to the latest edition of USEPA's OAQPS Control Cost Manual. As presented in Attachment 3, the updated cost effectiveness for combined application of a separator cover system with thermal oxidizer is $10,015 / ton VOC removed, representing a 12% increase compared to the last RACT analysis in 2020.

Based on this requisite analysis for the Wastewater Treatment Plant and considering a RACT III cost-effectiveness benchmark for presumptive VOC RACT of $7,500, IWI concludes that the RACT II case-by-case determination for the 1997 and 2008 8-hr ozone NAAAS remains RACT for the 2015 8-hr ozone NAAQS.

If you have any questions or comments concerning this RACT evaluation and analysis, please initially contact Dan Goldsmith, Site Environmental Manager, at 814-887-4056.

IWI certifies that the information provided in this RACT evaluation and analysis is true, accurate and complete to the best of my knowledge, information and belief formed after reasonable inquiry.

International Waxes, Inc.

_____ _____

Stephen Jeffs
Chief Operating Officer, Wax Production & Refining
The International Group, Inc. (IGI)

Date