STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
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OFFICE OF THE SECRETARY

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Secretary's Order No.: 2021-A-0023

RE: Application of Croda, Inc., for modification of the existing federally enforceable 7 DE Admin. Code 1102 Construction Permit (APC-2016/0068-CONSTRUCTION [Amendment 4] [NSPS] [MACT] [VOC RACT] [MMNSR] [FE]) for the 30,000 tons per year ("TPY") Ethylene Oxide ("EO") plant located at the Atlas Point facility, 315 Cherry Lane, New Castle, Delaware

Date of Issuance: August 17, 2021

Effective Date: August 17, 2021

Under the authority vested in the Secretary of the Department of Natural Resources and Environmental Control ("Department" or "DNREC"), pursuant to 7 *Del.C.* §§6003, 6004, 6006, Delaware's regulations concerning air quality, 7 DE Admin. Code 1100, specifically, Section 1102, *Permits,* and all other relevant statutory authority, the Department of Natural Resources and Environmental Control ("Department" or "DNREC") issues this Order, approving the request for modification of the existing federally enforceable 7 DE Admin. Code 1102 Construction Permit (APC-2016/0068-CONSTRUCTION [Amendment 4] [NSPS] [MACT] [VOC RACT] [MNSR] [FE]), hereinafter referred to as the "1102 Permit" of Croda, Inc. ("Croda" or "Applicant"), for the 30,000 tons per year ("TPY") Ethylene Oxide ("EO") plant located at Croda's Atlas Point facility, 315 Cherry Lane, New Castle, Delaware ("Application").

The proposed modifications to the Applicant's existing 1102 Permit for the Atlas facility, in accordance with both the Application and recent Settlement Agreement of February 26, 2021, are subject to various state and federal regulatory requirements, including, but not limited to, Delaware's regulations concerning air quality, 7 DE Admin. Code 1100, specifically, Section 1102, *Permits*, and as provided for under Delaware law in 7 *Del.C.* Ch. 60.

Background, Procedural History and Findings of Fact

The Applicant operates a multi-step continuous process to produce EO from ethanol. Ethanol is reacted with oxygen to form ethylene, which is in turn reacted to form EO. The EO is then purified, stored, and used on-site as a raw material in manufacturing surfactants that promote the mixing of oil and water-based ingredients in consumer products such as shaving cream and pharmaceuticals.

The design capacity of the Applicant's EO plant is 30,000 TPY of EO. Major emitting equipment at the plant includes an Ethanol Dehydration Furnace ("EDF"), a Catalytic Combustion Unit ("CCU") to control emissions from the carbonate regenerator, and two EO storage tanks. Side-streams include technical grade mono-ethylene glycol, polyglycols, and by-product carbon dioxide. Certain gas streams generated by the process, which contain organic constituents, are controlled by destruction in the EDF or CCU. Other sources of emissions include an ethyl chloride chemical addition pot, start-up/shutdown activities, storage tanks, an emergency generator, three fire pumps, and fugitive sources.

On September 17, 2020, Croda performed performance testing ("stack testing") of the T-330 Vent Scrubber ("Vent Scrubber") and F-610 Drying Colum Hotwell ("Hotwell") components of the EO plant as prescribed in Permit AQM-003/00058 (Renewal 3) (Revision 5). Testing was stopped midway through the planned tests due to concerns about results observed in the Hotwell and the EO plant was placed into a maintenance shutdown.

Due to the above noted shutdown, additional testing of the EDF and the CCU was not performed. The partial test results obtained showed violations of the emissions limits for both the Vent Scrubber and the Hotwell.

On December 30, 2020, Croda forwarded an amendment letter to DNREC requesting proposed 1102 Permit modifications. This letter, received by the Department's Division of Air Quality ("DAQ") on January 4, 2021, enclosed a permit modification application for changes to the Vent Scrubber and the Hotwell, as described above. Both changes were proposed to reduce emissions from the Applicant's facility by directing the vapor discharge stream to other process equipment at the EO plant.

On January 12, 2021, re-testing of the Vent Scrubber was performed (at a higher water flow rate than the September 2020 testing), achieving passing results. During the Department's discussion of the changes proposed in the Application at that time, Croda stated that vent gases would be flowed through (not diverted around) the Vent Scrubber. The Department maintained that it was necessary to maintain water flow through the Vent Scrubber at all times. Croda's Operations group questioned the need for this continuous water flow when the vent gases are being directed back into the process, however, the Safety, Health and Environmental group acknowledged the necessity for this provision.

On February 26, 2021, a Settlement Agreement was reached between the Department and Croda regarding exceedances during the September 2020 and January 2021 performance tests referenced above. The Settlement Agreement calls for certain changes to the Applicant's Title V Permit. Those changes are first being made to this underlying 1102 Permit and are set forth in detail in the Department's Technical Memorandum (May 24, 2021) from Joanna L. French, P.E., Engineer IV, and Eric S. Rowland, Engineer, both experts with the Department's DAQ. This Technical Memorandum was incorporated into the hearing record ("Record") at the time of the public hearing held in this matter on June 29, 2021, as "DNREC Exhibit 5."

The proposed modifications to Croda's existing permit, in accordance with both the Application and recent Settlement Agreement of February 26, 2021, will allow the following:

- For the T-330 Vent Scrubber, two operation scenarios will be allowed. The first scenario would be for normal operation, where vent gases would pass through the scrubber and then be directed back into the process. The second scenario would be for maintenance activities (while the EO plant would be off-line), such as purging of transfer lines and storage tanks. In the second scenario, vent gases would pass through the scrubber and exhaust to atmosphere.

- For the F-610 Drying Column Hotwell, the vapors/gases from this unit will be rerouted to B-1210 EDF for destruction. No emissions to atmosphere would occur.

- Emissions limits from the Vent Scrubber will remain unchanged, however, the percent Volatile Organic Compound ("VOC") reduction shall increase from 95% to 99%, and the scrubber shall be operated within parameters set by performance testing.

- Emissions from the EDF will be increased, not due to changes, but rather due to an error in the original permit, where average values were used instead of design (or worst case) values. The emissions changes are specified as follows: Carbon Monoxide ("CO") from 0.46 lb./hr. and 2.0 TPY to 1.0 lb./hr. and 4.5 TPY; Nitrogen Oxide ("NOx") from 0.33 lb./hr. and 1.4 TPY to 0.74 lb./hr. and 3.2 TPY; Sulfur Dioxide ("SO_2") from 0.014 TPY to 0.0073 lb./hr. and 0.29 TPY; VOC from 1.0 lb./hr. and 4.5 TPY to 1.3 lb./hr. and 5.7 TPY; and PM_{10} from 0.04 lb./hr. and 0.18 TPY to 0.093 lb./hr. and 0.41 TPY.

It should be noted that the pending Application for the 1102 Permit is for approval of construction that will allow Croda to test the above scenarios to ensure long-term viability. The Applicant's emissions levels are not being addressed by the Department in this Application at this time. Upon Croda's completion of construction, the Department will incorporate the operating conditions and limits of the Applicant's 1102 Permit into the facility's existing Title V permit (Permit: AQM-003/00058) via an Administrative Amendment.

The Applicant's Permit Modification Application referenced above (dated December 30, 2020) was received by the Department on January 4, 2021. A revised Permit Modification Cover Letter (which provided additional information as requested by the Department's experts in the Division of Air Quality) was received on April 16, 2021. Accordingly, the Department published legal notices in the *Sunday News Journal* and the *Delaware State News* on May 30, 2021, advertising that a public hearing would be held regarding this Application. Thereafter, the Department held its virtual public hearing on June 29, 2021, as referenced above.

Department staff, representatives of Croda, and members of the public attended the June 29, 2021 public hearing. The Record remained open for receipt of public comments through July 14, 2021, however, no comments were received by the Department at any phase of this hearing matter. Proper notice of the hearing was provided as required by law.

The Department's experts in the DAQ believe that the finalized draft 1102 Permit addresses the technical and regulatory concerns of both the Department and the permittee, while fulfilling the Department's mission to protect the public health and the environment. It should be noted that no changes were made to the Draft Permit subsequent to the time it was originally made available for the public to review, per the Department's legal notice of May 30, 2021.

Following the close of the public comment period as noted above, Hearing Officer Lisa A. Vest prepared her Hearing Officer's Report ("Report"), dated July 19, 2021, which expressly incorporated the Department's Technical Memorandum of May 24, 2021, as referenced above, therein. Ms. Vest's Report set forth the procedural history, summarized and established the record of information ("Record") relied on in the Report, and provided findings of fact, reasons, and conclusions that recommend the Department approve Croda's Application, subject to the conditions set forth in the finalized 1102 Permit prepared by the Department's DAQ experts. The Report is incorporated herein by reference.

Reasons and Conclusions

The pending Application submitted by Croda in this matter seeks modification of the Applicant's existing 1102 Permit, as set forth above. I find that the proposed removal of the Hotwell emission point, further definition of the operation(s) of the Vent Scrubber, and correction of the EDF emission limits for the Applicant's EO plant located at the Atlas Point facility at 315 Cherry Lane, New Castle, Delaware requires the Applicant to obtain modifications to the existing 1102 Permit, as noted above. I further find that the Applicant's proposed modifications are subject to various state and federal regulatory requirements, including, but not limited to, Delaware's regulations concerning air quality, 7 DE Admin. Code 1100, specifically, Section 1102, *Permits*, and as provided for under Delaware law in 7 *Del.C.* Ch. 60.

In reviewing the applicable statutes and regulations, as well as weighing public benefits of this project against potential detriments, the Department's experts in the Division of Air Quality have concluded that the pending Application complies with all applicable federal and state laws and regulations. The 1102 Permit that would be issued by the Department would be reflective of the Application submitted, and would include operational, monitoring, and reporting requirements intended to protect public health and the environment.

The Record developed in this matter indicates that the Department's experts in the DAQ have considered all statutes and regulations that govern projects such as the Applicant's above proposed modifications and have recommended approval of the 1102 Permit necessary for the same. I find and conclude that the Applicant has adequately demonstrated compliance with all requirements of the statutes and regulations, and that the Record supports approval of the Application as submitted by Croda in this matter.

Accordingly, this Order approves the issuance of the above referenced 1102 Permit for the Applicant's facility located at Atlas Point, 315 Cherry Lane, New Castle, Delaware, consistent with the Record developed in this matter and with appropriate conditions.

Further, the Department concludes and specifically directs the following:

1. The Department has jurisdiction under 7 *Del. C.* Ch. 60 and Delaware's regulations concerning air quality, 7 DE Admin. Code 1100, specifically, Section 1102, *Permits*, and all other relevant statutory authority, to make a final determination on the Application submitted by Croda after holding a public hearing and considering all information contained in the Record generated in this matter;

2. The Department provided proper public notice of the Application submitted by Croda, and of the public hearing held on June 29, 2021, and held said hearing to consider any public comments that may be offered on the Application, in a manner required by the law and regulations;

3. The Department has carefully considered all factors required to be weighed in issuing the permit required by the Application, and finds that the Record supports approval of the same;

4. The Department shall issue to Croda a federally enforceable 7 DE Admin. Code 1102 construction permit (APC-2016/0068-CONSTRUCTION [Amendment 4] [NSPS] [MACT] [VOC RACT] [MNSR] [FE]) to allow modifications of the 30,000 TPY EO plant located at Atlas Point, 315 Cherry Lane, New Castle, Delaware, consistent with the Record developed in this matter. Furthermore, said permit shall include all conditions as set forth in the Department's Draft Permit for Croda, to ensure that Delaware's environment and public health will be protected from harm;

5. The Department adopts the Report and its attachment as further support for this decision;

6. The Department has an adequate Record for its decision, and no further public hearing is appropriate or necessary; and

7. The Department shall serve and publish its Order on its internet site.

Shawn M. Garvin
Secretary