



STATE OF DELAWARE  
**DEPARTMENT OF NATURAL RESOURCES AND  
ENVIRONMENTAL CONTROL**

RICHARDSON & ROBBINS BUILDING  
89 KINGS HIGHWAY  
DOVER, DELAWARE 19901

OFFICE OF THE  
SECRETARY

PHONE  
(302) 739-9000

**NOTICE OF ADMINISTRATIVE PENALTY ASSESSMENT  
AND SECRETARY'S ORDER**

Pursuant to 7 *Del. C.* § 6005

**Order No. 2021-A- 0025**

*PERSONALLY SERVED BY AN ENVIRONMENTAL  
PROTECTION OFFICER*

**Issued To:**

Delaware City Refining Company, LLC  
Attn: Michael Capone  
Refinery Manager  
4550 Wrangle Hill Road  
Delaware City, DE 19706

**Registered Agent:**

The Corporation Trust Company  
Corporation Trust Center  
1209 Orange Street  
Wilmington, DE 19801

This Assessment and Secretary's Order serves to notify Delaware City Refining Company, LLC ("Respondent" or "Refinery") that the Secretary of the Department of Natural Resources and Environmental Control ("Department") has found Respondent in violation of 7 *Del. C.* Chapter 60, state air regulations and its permit. Accordingly, the Department is issuing this Notice of Administrative Penalty Assessment and Secretary's Order pursuant to 7 *Del. C.* §6005(b)(3).

***BACKGROUND***

Respondent owns and operates a petroleum refinery located in Delaware City, Delaware, ("Refinery") where it manufactures various petroleum-based products, including gasoline, diesel, and jet fuels, and other marketable petroleum by-products.

The Department issued a Title V Permit in three separate parts to Respondent on April 12, 2018, and revised versions were issued October 3, 2019. These permits were issued pursuant to Regulation 1130 (“Title V State Operating Permit Program”) of the State of Delaware’s *Regulations Governing the Control of Air Pollution* (known as 7 DE Admin. Code 1130 and hereinafter referred to as “Regulation 1130”). Permit: **AQM-003/00016-Part 2 (Renewal 1)(Revision 3)** dated April 12, 2018 [“TV Permit (Part 2-Ren 1-Rev 3)”]; Permit: **AQM-003/00016-Part 1 (Renewal 2)(Revision 4)** [“TV Permit (Part 1-Ren 2-Rev 4)”] dated October 3, 2019; Permit: **AQM-003/00016-Part 2 (Renewal 1)(Revision 4)** dated October 3, 2019 [“Title V Permit (Part 2-Ren 1-Rev 4)”] and Permit: **AQM-003/00016-Part 3 (Renewal 2)(Revision 4)** dated October 3, 2019 [“Title V Permit (Part 3-Ren 2-Rev 4)”] are the parts and revisions of the Title V Permit applicable to the violations addressed in this Order. Respondent’s permits require it to report deviations from the permits. These reports, along with supplemental information provided by DCRC, are the basis for the factual assertions below. DNREC expressly reserves the right to take further enforcement action should it become aware that the descriptions of the violations, the Respondent’s actions, or the pollutant emissions were not accurately represented in Respondent’s reports. This Order addresses the violations described below.

### **Sulfur Recovery Unit (“SRU”) Shell Claus Off-Gas Treatment I (“SCOT I”) Incinerator Failed Stack Test**

Title V Permit-Part 2 requires Respondent to conduct stack testing of oxides of nitrogen (“NO<sub>x</sub>”), carbon monoxide (“CO”) and sulfuric acid (“H<sub>2</sub>SO<sub>4</sub>”), of the SRU, SCOT I, Incinerator to demonstrate compliance with emission limits on an annual basis. Stack testing was conducted on August 14, 2019, and the results showed that Incinerator exceeded the permitted limits for H<sub>2</sub>SO<sub>4</sub>. During the testing, a couple of trip events occurred that were due to flame instability that Respondent suggests may have caused the higher H<sub>2</sub>SO<sub>4</sub> levels. The average of the three runs for stack testing was 3.76 lbs./hr. which was above the permitted limit of 3.2 lbs./hr. Respondent retested on October 29, 2019, and the results submitted on December 19, 2019, showed the unit had returned to compliance with an average of 2.5 lbs./hr.

A Notice of Violation dated February 6, 2020, was issued to Respondent on February 10, 2020, for the violations associated with the SRU, SCOT I, Incinerator stack test conducted on August 14, 2019.

### **Polymerization (“Poly”) Unit Reactor Hydrocarbon Leak**

In an Incident Report dated December 23, 2019, Respondent provided information regarding a leak from the Poly Unit Reactor (“Reactor”) that occurred on November 27, 2019. The Poly Unit had undergone catalyst change and was in the process of being restarted with the introduction of feed beginning at 9:00 a.m. on November 27, 2019. Operations personnel identified a leak at the flange for the Reactor bottom outlet nozzle at 10:30 a.m. during the startup of the Reactor. Shutdown procedures were immediately undertaken to depressure the Reactor. The leak event ended at 11:45 a.m. and resulted in the unpermitted release of 4,250 lbs. of propane; 2,000 lbs. of propylene; and 820 lbs. of isobutane. A clamp was installed around the Reactor nozzle flange to prevent a leak upon restart.

A Notice of Violation dated April 2, 2020, was issued to Respondent on April 7, 2020, for the violations associated with the Poly Unit Reactor leak on November 27, 2019.

### **Sulfur Recovery Area (“SRA”) Hydrogen Sulfide (“H<sub>2</sub>S”) Leak**

During a Partial Compliance Evaluation (“PCE”) of the SRA conducted by DAQ on August 18, 2020, Respondent revealed that it had discovered a leak, approximately 6 months prior, at one of the sulfur pits on February 13, 2020, as part of a routine audit. Through that PCE, subsequent conversations with facility environmental staff, and submitted documentation, the Department learned that Sulfur Pit 1 (“pit”) had an H<sub>2</sub>S leak through an intake vent which usually draws air across the pit to maintain a vacuum. Operators typically aim to maintain a pressure of -0.5 inches water column across the pit, but during the leak were only able to maintain approximately -0.3 inches water column. While the pit maintained negative pressure, it was not sufficient to prevent the leak of H<sub>2</sub>S gas from the pit. The system was designed and constructed with two simultaneously operated eductor systems that allows for one of the two

systems to be taken offline while still maintaining negative pressure across the sulfur pits. The eductor for Sulfur Pit 1 had a hole in the eductor line requiring additional steam in the system to maintain negative pressure. In addition, the eductor for Sulfur Pit 2 experienced some clogging and was brought out of service. The eductor pipes are heated with steam jacketing to prevent sulfur crystallizing near the pit lid; the heating creates a natural draw in the pipe. With the eductor for Sulfur Pit 2 out of service, the natural draft created by the vent, and the hole in the eductor line, the eductor for Pit 1 was unable to consistently maintain sufficiently negative pressure to prevent visible emissions. Following the February 13, 2020, discovery of the leak by Respondent, it issued a work order for a repair which was completed nine months later, on November 20, 2020. Worst case calculations estimate 18.4 lbs./day of H<sub>2</sub>S had been emitted during this period; however, Respondent states that emissions were likely brief and intermittent depending on a variety of factors including weather conditions and operating scenarios.

The Department recognizes that Respondent implemented several corrective actions upon discovery of the leak including optimizing the air flow used to de-gas the sulfur in the pit based on sulfur production, erected scaffolding to allow for easy access to the sulfur eductor line for regular inspection and repair, implemented regular visual observations, issued a work order to replace the eductor line that experienced plugging, caulked the sulfur pit area to seal potential pathways for emissions, and adjusted steam flow to minimize the draw from the intake vent line. From the February 13, 2020, leak detection until repair was completed on November 20, 2020, as much as 5,188 lbs. of H<sub>2</sub>S was emitted assuming continuous leakage.

Respondent did not include these emissions in its semi-annual deviation reports submitted for the 1st and 2nd halves of 2020, and the annual compliance certification for 2020, as it declines to recognize this leak as a deviation for many reasons. These reasons include: the daily emissions were below the reportable threshold; Respondent believes actual emissions were brief and intermittent; the sulfur pit was constructed in accordance with applicable standards and included a redundant educator system; the system maintained the required negative pressure; and lastly, Respondent believes the technical method for establishing negative pressure is a design-based standard and there is no basis to suggest the original design standards have changed.

A Notice of Violation dated March 31, 2021, was issued to Respondent on April 20, 2021, for the unpermitted emissions and reporting violations associated with the H<sub>2</sub>S leak from the SRA discovered on February 13, 2020.

### **Hydro-Desulfurizer (“HDS”) Train 4 Heater Fire**

Respondent’s HDS is comprised of five trains to remove sulfur from naphtha, kerosene, gasoline, diesel, and distillate materials. Train 4 processes diesel at a rate up to 16,000 barrels per day. The material is preheated then processed in a catalytic reactor; the material is then reheated in a reboiler heater. This process is necessary to meet the sulfur requirements for diesel. Prior to desulfurization, the diesel material sulfur content is approximately 6,600 parts per million by weight.

On March 11, 2020, Respondent’s HDS Train 4 experienced a fire. According to the event Incident Report dated April 9, 2020, and subsequent conversations with facility representatives on March 17, 2020, Tube 66, inside of the HDS Train 4 Reactor Feed Heater (“29-H-4”), overheated and ruptured. The ruptured pipe allowed untreated diesel material to flow into the firebox of the heater and ignite and at approximately 1:35 p.m. the fire began. Operations personnel isolated heater 29-H-4 and commenced orderly shutdowns of Train 4 and neighboring Trains 2, 3, and 5. The fire was extinguished at 4:19 p.m.

It was determined that the tube failed due to a combination of long-term and short-term overheating. Coke buildup in the pipe caused localized hotspots. Typically, liquid moving through the pipes removes heat from the metal surface, however, the buildup of solids along the sides prevented the heat from dissipating. Much of the visible emissions and pollutants from the fire were released through Train 4’s stack. The stack height and structure would promote mixing and dilution of the pollutants to reduce the environmental safety impacts on the surrounding area. Some material leaked outside of the unit; pollutants emitted from this external portion of the fire would not have experienced the same mixing and dilution as the pollutants that were emitted through the unit’s stack. The external portion of the fire was suppressed with water by Respondent’s fire brigade.

Respondent conducted community monitoring of H<sub>2</sub>S, sulfur dioxide, (“SO<sub>2</sub>”), ammonia (“NH<sub>3</sub>”), CO, and oxygen gas (“O<sub>2</sub>”) with a 5-gas meter and of volatile organic compounds (“VOC”) with a photo-ionization detector. The monitoring did not register elevated pollutant levels at the fence line. Additionally, the Department’s ambient air monitoring station located in Delaware City did not register any elevated pollutant levels. As a result of the fire, an estimated 3,500 lbs. of diesel material was combusted resulting in the unpermitted release of 360 lbs. of SO<sub>2</sub>; 235 lbs. of NO<sub>x</sub>; 46 lbs. of particulate matter (“PM”) and 18 lbs. of CO. In addition, visible emissions exceeded regulatory and permit limits which prohibit visible air contaminants with an appearance greater than 20 percent opacity for an aggregate of more than three minutes in any one hour or more than 15 minutes in any 24-hour period.

As a result of a similar fire that occurred in 2012 at the same 29-H-4 Heater, Respondent had implemented a facility wide infrared (“IR”) scan inspection program on its heaters including 29-H-4 which is scanned on a quarterly basis. The most recent IR scan was conducted in February of 2020 through the unit’s portholes, but the IR scan did not identify any issues. Despite a partition wall in the heater that obstructs visibility of 30 percent of the tubes, Respondent states that it believed that the IR scans provided information representative of the entire heater. The ruptured portion of Tube 66 was obscured by the partition wall. In addition, the heater had regular maintenance inspections in 2014 and 2018. During the shutdowns the unit is inspected, tubes are sampled for coke buildup, and x-rayed and calipered to detect bulging. The heater has eight thermocouples throughout the unit to monitor tube skin temperatures, and in the event of a high temperature alarm at one of the thermocouples, operators respond accordingly. In this incident, the alarm and the fire occurred in close succession before the issue could be identified and corrected.

A Notice of Violation dated July 2, 2020, was issued to Respondent on July 9, 2020, for the violations associated with the March 11, 2020, fire at the HDS Train 4. Respondent has implemented corrective actions after the March 11, 2020, fire that include inspection of all radiant section tubes in 29 H-4 and the subsequent repair/replacement of radiant section tubes 48, 50, 64, 66, 67, and 68.

### **Boiler 2 Failed Stack Test**

TV Permit (Part 3-Ren 2-Rev 4), requires that Respondent conduct stack testing to show compliance with permitted emission limits for total suspended particulates (“TSP”), particulate matter 10 micrometers or less (“PM<sub>10</sub>”), H<sub>2</sub>SO<sub>4</sub>, and VOC of Boiler 2 located at the power plant at the refinery. As a result of the reduced market demand caused by the Covid-19 pandemic, the major units at the refinery had been operating at lower rates. When stack testing units, Respondent typically tests while running close to maximum rates. The Boiler 2 stack testing conducted on July 14 and July 15, 2020, showed PM<sub>10</sub> emissions averaged 0.0169 lbs./mmBtu which exceeded the permitted limit of 0.0104 lbs./mmBtu. Respondent believes that the short, sharp increase of fuel flow to bring Boiler 2 from lower steam rates to the higher targeted steam rate needed for the testing, resulted in the non-compliant results. A retest of Boiler 2 was conducted on October 13, 2020, and it showed that the unit had returned to compliance. Respondent continued operation of the non-compliant unit during the time period between July 15, 2020 and October 13, 2020.

A Notice of Violation dated December 11, 2020, was issued to Respondent on December 17, 2020 for the violations associated with the Boiler 2 stack test conducted on July 14 and July 15, 2020.

### **Butamer Unit Fire**

According to an Incident Report dated October 9, 2020, and conversations with facility representatives on October 19, 2020, hydrocarbons were released from the Butamer Feed Surge Drum (“44-D-3”) and found an ignition point resulting in a fire on September 10, 2020. The Incident Report indicated that the Butamer Unit had been down for planned maintenance and was preparing for start-up. Start-up procedures include introducing nitrogen to flush oxygen from the systems that had been accessed as part of the maintenance activities. Because the Feed Surge Drum was not opened during the maintenance outage and contained butane; it was to remain isolated during the oxygen flush. Operations personnel opened the upstream side control valve, 44-LV-707, to allow the nitrogen to reach the outlet, however, they also erroneously

opened the surge drum side of the valve. This allowed butane to flow out of the Butamer Feed Surge Drum. The release lasted approximately five minutes. At approximately 8:19 p.m., the butane found an ignition source and the fire commenced. The control valve lost power and switched to the fail-safe closed position once again isolating the butane source. Respondent extinguished the fire by 9:05 p.m. The leak resulted in the release of 3,800 lbs. of butane, 900 lbs. of isobutane, and 650 lbs. of pentane.

A Notice of Violation dated December 11, 2020, was issued to Respondent on December 17, 2020, for the violations associated with the leak from the Butamer Feed Surge Drum that resulted in the Butamer Unit fire on September 10, 2020. The report indicated that the Butamer Start-up Procedure is being enhanced to include information on flushing oxygen from the affected portions of the unit.

### **Fluid Coking Unit (“FCU”) Carbon Monoxide Boiler (“COB”) Outage**

The FCU is equipped with a COB and wet gas scrubber (“WGS”) train as pollution control devices to control CO, NO<sub>x</sub>, SO<sub>2</sub>, and PM emissions. The FCU is also equipped with a Back-Up Incinerator (“BUI”) which is permitted to operate during periods when the COB is down to control CO and PM emissions. The BUI does not control NO<sub>x</sub> or SO<sub>2</sub> emissions—these pollutants are controlled by the Selective Non-Catalytic Reduction System located in the FCU COB and the downstream WGS train respectively. During normal operation, the FCU burner flue gas is routed to the FCU COB and WGS train via an open water seal drum (“22-D-20”). However, when the FCU COB and WGS train are bypassed, the FCU burner flue gas can be routed in one of two ways, i.e., either through the BUI via water seal drum (“22-D-27”), or through the bypass stack via water seal drum (“22-D-21”). The FCU permit is structured to require operation of the FCU with its flue gas routed through the COB and downstream WGS at all times. Routing the FCU burner flue gas through water seal drum 22-D-27 to the BUI will control PM and CO emissions but will not control NO<sub>x</sub> or SO<sub>2</sub> emissions. When the FCU flue gas is routed through the bypass stack, all pollutants are emitted uncontrolled and constitute unpermitted emissions. It can take several hours to bring the BUI online in order to follow



recommended BUI warm up procedures, when shorter duration unplanned outages occur, the FCU burner flue gas is not sent to the BUI but through the bypass stack.

According to an Incident Report dated November 23, 2020, the FCU COB tripped offline on October 26, 2020, at 9:26 a.m. as a result of a miscommunication between two field operators during a routine monthly forced draft fan swap, from 22-K-403A to 22-K-403B. The first fan was prematurely shutdown before the second fan was fully placed into service. The COB and WGS were bypassed starting at 9:54 a.m. The pilots and the burner on the COB were relit at approximately 12:18 p.m. and the COB temperature was ramped back up to normal operating temperatures. The release event ended at 3:42 p.m. when the flue gas was redirected back into the COB. The upset lasted 6.4 hours and released 15,000 lbs. of SO<sub>2</sub>, 930 lbs. of ammonia (NH<sub>3</sub>), 140 lbs. of H<sub>2</sub>S, 110 lbs. of hydrogen cyanide and 180,000 lbs. of CO.

A Notice of Violation dated March 31, 2021, was issued to Respondent on April 20, 2021, for the violations associated with the FCU COB outage on October 26, 2020. The procedure for the forced draft fan swap was updated to transfer the responsibility of the fan shutdown to the board operator with the field operator externally verifying shutdown completion.

### **Flaring Related Violations**

The operation of a refinery blowdown system, which includes a flare system, is governed by Respondent's Title V permit. The purpose of the flare system is to safely handle and dispose of combustible gases and vapors that are released during refinery upsets, startups, and shutdowns in order to minimize impacts on the environment. Although the Respondent is permitted by the Department to utilize the flare system to minimize impacts on the environment, the permit does not allow the emission of pollutants from the flare. Hydrocarbon flaring episodes are of concern to the Department because they have the potential to emit large amounts of criteria pollutants such as NO<sub>x</sub> and SO<sub>2</sub>. The amount of pollution emitted during a flaring episode is entirely dependent on the source of the gases being flared, the duration and rate of the flaring, along with the quantity and sourness (H<sub>2</sub>S content) of the gas emitted from the flare.

From July 1, 2019, through December 31, 2020, Respondent experienced hydrocarbon flaring events on 4 days. The specific dates of the incidents covered by this Order, and a brief description of the flaring events as detailed in reports from Respondent, are described below.

July 31, 2019

In an August 28, 2019, Hydrocarbon Flaring Incident Report, Respondent provided information on a July 31, 2019, flaring incident. A compromised air line on a process control valve caused the valve to fail to the closed position resulting in high pressure in the Polymerization Unit reactor feed loop. The system vented to the flare recovery header line, and at approximately 6:15 p.m., refinery personnel opened the control valve bypass and reestablished flow through the reactors. Flaring ended at approximately 6:25 p.m., after 9 minutes. A subsequent investigation found the tubing fitting on the regulator for the process control valve was leaking and was therefore replaced. The flaring event resulted in the unpermitted release of 250 lbs. of SO<sub>2</sub>.

October 23, 2019

Pursuant to Respondent's November 22, 2019, Hydrocarbon Flaring Incident Report, at approximately 4:40 a.m. on October 23, 2019, a high-level alarm sounded on the Pressure Swing Adsorption ("PSA") Feed Knock-Out Drum of the Continuous Catalyst Reformer Unit. Twenty minutes later, another alarm registered for the High Knock-Out Drum Level Shutdown and the PSA tripped offline. This resulted in the increase of the upstream pressure which activated two pressure relief valves, automatically redirecting the hydrogen flow to the flare header and flaring commenced at 4:59 a.m. Operations personnel did not initially realize the additional flow to the flare header was as a result of this upset, and at 5:43 a.m., the hydrogen flow was manually redirected to the fuel stabilization line. Flaring ended at 5:52 a.m. resulting in the unpermitted release of approximately 300 lbs. of SO<sub>2</sub>, at a flow rate of 705,000 standard cubic feet ("scf"), over the course of the 53 minutes. The scf flow rate exceeded the federal threshold of 500,000 scf which triggered root cause analysis and corrective action requirements pursuant to 40 CFR §

60.103a(c)(1)(ii). The cause was determined to be the PSA Feed Knock-Out Drum liquid level indicator which was subsequently repaired.

A Notice of Violation dated February 14, 2020, was issued to Respondent on February 21, 2020, for the violations associated with the flaring events that occurred on July 31, 2019, and October 23, 2019, as described above.

#### March 1, 2020

Respondent's Hydrocarbon Flaring Incident Report dated March 31, 2020, states that on March 1, 2020 at approximately 8:18 a.m., a flaring event caused the unpermitted release of 200 lbs. of SO<sub>2</sub>. The Alky Unit Propylene Splitter controls the tower pressure with a hot condenser bypass stream. At 7:26 a.m. on March 1, 2020, the tower pressure indication fell below the set point. The pressure transmitter, however, was frozen due to cold overnight temperatures and held near the pressure set point rather than reducing the bypass valve position. Pressure continued to build in the Propylene Splitter tower ("27-C-701"), until the pressure safety valves lifted to the flare recovery header line. Flaring commenced at 8:18 a.m. and lasted 24 minutes. At 8:25 a.m., operations personnel reduced heat input to the tower allowing the pressure to fall. The flaring event ended at 8:42 a.m. The pressure transmitters were tested after the flaring event and heat tracing and insulation were installed for the affected transmitters.

#### May 16, 2020

Respondent's Hydrocarbon Flaring Incident Report dated June 15, 2020, states that on May 16, 2020, at approximately 5:23 p.m., the Hydrocracker Unit's ("36-H-1") Recycle Hydrogen Flow Transmitter ("36-FT-133"), reported false high flow due to entrained debris. The false high indication caused the Recycle Hydrogen Flow Controller to close, shutting down the 36-H-1 heater. In turn, the Reactor Bed 1 ("36-R-3") temperatures rose due to loss of recycle hydrogen flow. Operations personnel responded to the rising temperature by initiating a slow depressurization of the reactor to the flare header. Flaring began at approximately 5:29 p.m. and lasted 25 minutes. The depressurization of the reactor was completed at 5:53 p.m. and flaring stopped at 5:54 p.m. and resulted in the unpermitted release of approximately 4,000 lbs. of SO<sub>2</sub>.

Respondent has raised the low output clamp from 0% to a level above the flow indicator low-low output (“LLO”) trip limit to prevent the 36-H-1 LLO flow shutdown condition and to keep recycle hydrogen flowing.

A Notice of Violation dated September 4, 2020, was issued to Respondent on September 10, 2020, for the violations associated with the flaring events that occurred on March 1, 2020, and May 16, 2020, as described above.

### ***FINDINGS OF FACT***

1. Respondent owns and operates a petroleum refinery located in Delaware City, Delaware whose operations are governed by a Title V Permit, issued pursuant to Regulation 1130, in three separate parts. Each part is renewed every 5 years following the prescribed permitting process. Revisions can occur as necessary and following the prescribed process. Respondent’s Title V Permit numbers referenced in this Order include the Part, Renewal and Revision in effect at the time of the violation.
2. Permit: **AQM-003/00016-Part 2 (Renewal 1)(Revision 3)** dated April 12, 2018, [“TV Permit (Part 2-Ren 1-Rev 3)”]; Permit: **AQM-003/00016-Part 1 (Renewal 2)(Revision 4)** [“TV Permit (Part 1-Ren 2-Rev 4)”] dated October 3, 2019; Permit: **AQM-003/00016-Part 2 (Renewal 1)(Revision 4)** dated October 3, 2019, [“TV Permit (Part 2-Ren 1-Rev 4)”] and Permit: **AQM-003/00016-Part 3 (Renewal 2)(Revision 4)** dated October 3, 2019, (“TV Permit (Part 3-Ren 2-Rev 4)”) are the Title V Permit numbers applicable to the violations addressed in this Order.
3. On August 14, 2019, a stack test of the SRU, SCOT I, Incinerator showed average H<sub>2</sub>SO<sub>4</sub> emissions of 3.76 lbs./hr. which was above the 3.2 lbs./hr limit set forth in TV Permit (Part 2-Ren 1-Rev 3). A retest on October 29, 2019, showed the unit had returned to compliance with the permitted limit. A Notice of Violation was issued to Respondent on February 10, 2020, for the August 14, 2019, failed stack test.

4. A leak from the Poly Unit Reactor occurred on November 27, 2019, that resulted in the unpermitted release of 4,250 lbs. of propane; 2,000 lbs. of propylene; and 820 lbs. of isobutane. A Notice of Violation was issued to Respondent on April 7, 2020, for the violations associated with the November 27, 2019, Poly Unit Reactor leak.
5. The Department learned during an onsite inspection on August 18, 2020, that Respondent had discovered an H<sub>2</sub>S leak at a sulfur pit in the SRA on February 13, 2020. The leak was due to one eductor system that was clogged being taken offline. The remaining eductor system was unable to maintain enough of a negative pressure across the sulfur pits due to damage in its eductor line. The repair was completed on November 20, 2020. The leak resulted in the unpermitted release of as much as 5,188 lbs. of H<sub>2</sub>S assuming continuous leakage.
6. Respondent did not report the unpermitted H<sub>2</sub>S emissions, visible emissions, and failure to route the sulfur pit vapors to the Claus reactors at all times, on any of the required semi-annual and annual certifications whose reporting periods included the time period of the SRA H<sub>2</sub>S Leak, February 13, 2020, through November 20, 2020.
7. A Notice of Violation was issued to Respondent on April 20, 2021, for the violations associated with the SRA H<sub>2</sub>S leak discovered on February 13, 2020.
8. On March 11, 2020, Respondent's HDS Train 4 experienced a fire that resulted in the unpermitted release of 360 lbs. of SO<sub>2</sub>; 235 lbs. of NO<sub>x</sub>; 46 lbs. of PM; 18 lbs. of CO; and visible emissions in excess of regulatory and permit limits.
9. A Notice of Violation was issued to Respondent on July 9, 2020, for the violations associated with the March 11, 2020, HDS Train 4 Heater fire.
10. Respondent conducted stack testing of Boiler 2, located at the refinery's power plant, to show compliance with permitted emission limits for PM<sub>10</sub> on July 14 and July 15,

2020. The results showed PM<sub>10</sub> emissions averaged 0.0169 lbs./mmBtu which exceeded the permitted limit of 0.0104 lbs./mmBtu. A retest of Boiler 2 was conducted on October 13, 2020, that showed the unit had returned to compliance. Respondent continued operation of the non-compliant unit during the time period between July 15, 2020, and October 13, 2020.
11. A Notice of Violation was issued to Respondent on December 17, 2020, for the violations associated with the Boiler 2 stack test conducted on July 14 and July 15, 2020.
  12. On September 10, 2020, the Butamer Unit was in the process of a restart following planned maintenance activities that included a purge of oxygen from components that had been accessed during the maintenance activities. The Butamer Feed Surge Drum was supposed to be isolated and not purged, as it was not accessed during maintenance, but it was mistakenly opened and leaked butane that subsequently encountered an ignition source that started a fire. The leak resulted in the release of 3,800 lbs. of butane, 900 lbs. of isobutane, and 650 lbs. of pentane.
  13. A Notice of Violation was issued to Respondent on December 17, 2020, for the violations associated with the leak from the Butamer Feed Surge Drum that resulted in the Butamer Unit fire on September 10, 2020.
  14. On October 26, 2020, during a routine monthly, forced draft fan swap (from 22-K-403A to 22-K-403B), a miscommunication between two field operators resulted in the first fan being prematurely shutdown before the second fan was fully placed into service. As a result of this, the FCU COB tripped offline at 9:26 a.m. and the COB and WGS were bypassed starting at 9:54 a.m. The release event ended at 3:42 p.m. when the flue gas was redirected back into the COB. The upset lasted 6.4 hours and released 15,000 lbs. of SO<sub>2</sub>, 930 lbs. of NH<sub>3</sub>, 140 lbs. of H<sub>2</sub>S, 110 lbs. of hydrogen cyanide, and 180,000 lbs. of CO.

15. A Notice of Violation issued to Respondent on April 20, 2021, for the violations associated with the FCU COB outage on October 26, 2020.
16. Respondent experienced hydrocarbon flaring events on July 31, 2019, and October 23, 2019, that resulted in the unpermitted release of 250 lbs. and 300 lbs., respectively, of SO<sub>2</sub>. A Notice of Violation was issued to Respondent on February 21, 2020, for the violations associated with these two flaring events.
17. Respondent experienced hydrocarbon flaring events on March 1, 2020, and May 16, 2020, that resulted in the unpermitted release of 200 lbs. and 4,000 lbs., respectively, of SO<sub>2</sub>. A Notice of Violation was issued to Respondent on September 10, 2020, for the violations associated with these two flaring events.

### ***STATUTORY, REGULATORY AND PERMIT PROVISIONS***

1. In 7 *Del. C.* §6003(a)(1) it states:  
*“No person shall, without first having obtained a permit from the Secretary, undertake any activity in a way which may cause or contribute to the discharge of an air contaminant.”*
2. In Section 2.1 of 7 DE Admin. Code 1102, it states:  
*“Except as exempted in Section 2.2 of this regulation, no person shall initiate construction, install, alter or initiate operation of any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to receiving approval of his application from the Department or, if eligible, prior to submitting to the Department a completed registration form.”*
3. In Section 2.1 of 7 DE Admin. Code 1111, it states:  
*“In New Castle County, no person shall cause or allow the emission of carbon monoxide from any catalytic regeneration of a petroleum cracking system, petroleum fluid coker, or other petroleum process into the atmosphere, unless the carbon monoxide is burned at 1300 °F for 0.3 seconds or greater in a direct-flame afterburner or boiler, or is controlled by an equivalent technique.”*

4. In Section 2.1 of 7 DE Admin. Code 1114, it states in part:  
*“No person shall cause or allow the emission of visible air contaminants or smoke from a stationary or mobile source, the shade or appearance of which is greater than 20% opacity for an aggregate of more than three minutes in any one hour or more than 15 minutes in any 24 hour period.”*
5. In Condition 3(c)(2)(ii)(C) of TV Permit (Part 1-Ren 2-Rev 4) it states:  
*“All emissions in excess of any permit condition or emissions which create a condition of air pollution shall be reported to the Department in a written report pursuant to Condition 3(c)(2)(i) and/or the specific reporting requirements listed in Condition 3 – Table 1 of this permit.”*
6. In Condition 3(c)(2)(i) of TV Permit (Part 1-Ren 2-Rev 4) it states in part:  
*“The Owner and/or Operator shall submit to the Department a report of any required monitoring not later than the first day of August (covering the period from January 1 through June 30 of the current calendar year) and the first day of February (covering the period July 1 through December 31 of the previous calendar year) of each calendar year. Each report shall identify any deviations from the monitoring, record keeping, and reporting requirements under this permit; and the probable cause of the deviations; and any corrective actions or preventable measures taken. If no deviations have occurred, such shall be stated in the report.”*
7. In Condition 3 – Table 1(a)(4)(i) of TV Permit (Part 1-Ren 2-Rev 4), it states:  
*“The Owner/Operator shall not cause or allow the emission of visible air contaminants and/or smoke from any emission unit, the shade or appearance of which is greater than 20 percent opacity for an aggregate of more than 3 minutes in any 1 hour or more than 15 minutes in any 24 hour period.”*
8. In Condition 3 – Table 1(j)(8)(i) of TV Permit (Part 2-Ren 1-Rev 3), it states:  
*“H<sub>2</sub>SO<sub>4</sub> emissions shall not exceed 3.2 lb/hr and 12.7 TPY combined from both SCOT units.”*
9. In Condition 3–Table 1(da)(1)(i)(C) of TV Permit (Part 2-Ren 1-Rev 4) it states:  
*“The Belco pre-scrubber, the amine-based Cansolv regenerative WGS, the caustic polishing scrubber and SNCR system shall be operating properly at all times when the FCU is operating.”*
10. In Condition 3–Table 1(da)(1)(i)(H) of TV Permit (Part 2-Ren 1-Rev 4), it states in part:  
*“This Permit does not authorize emissions exceeding the limits set forth in Condition 3 – Table 1.da.2 through da.10 including emissions during periods of any unplanned shutdown of the FCU, or any unplanned shutdown or bypass of the FCU COB or the Belco prescrubber or WGS. Instead, in the event of any unplanned shutdown of the*



*FCU or any unplanned shutdown or bypass of the FCU COB or Belco prescrubber or the WGS, the Owner/Operator shall bear the burden of demonstrating to the Department's satisfaction that the Owner/Operator's continued operation of the FCU should not subject the Owner/Operator to an enforcement action for noncompliance with emission limitations or operating standards included in this Permit or otherwise applicable to the facility under the State of Delaware "Regulations Governing the Control of Air Pollution." Such demonstration must at a minimum be supported by sufficient documentation and emissions data including all relevant emissions calculations, formulas, and any assumptions made thereof."*

11. In Condition 3–Table 1(da)(5)(i)(B) of TV Permit (Part 2-Ren 1-Rev 4), it states:

*"The Owner/Operator shall not cause or allow the emission of carbon monoxide from the FCU unless it is burned at no less than 1300 °F for at least 0.3 seconds in the FCU COB."*

12. In Condition 3–Table 1(da)(11)(i) of TV Permit (Part 2-Ren 1-Rev 4), it states:

*"The Owner/Operator shall not cause or allow the emission of visible air contaminants and/or smoke from any emission unit, the shade or appearance of which is greater than 20 percent opacity for an aggregate of more than 3 minutes in any 1 hour or more than 15 minutes in any 24 hour period."*

13. In Condition 3 – Table 1(j)(1)(i)(I) of TV Permit (Part 2-Ren 1-Rev 4), it states:

*"The sulfur pit vapors shall be routed to the Claus reactors at all times except during periods of low acid gas generation and other atypical operating conditions."*

14. In Condition 3 – Table 1(j)(9)(i) of TV Permit (Part 2-Ren 1-Rev 4), it states:

*"The Owner/Operator shall not cause or allow the emission of visible air contaminants and/or smoke from any emission unit, the shade or appearance of which is greater than twenty (20) percent opacity for an aggregate of more than three (3) minutes in any one (1) hour or more than fifteen (15) minutes in any twenty-four (24) hour period."*

15. In Condition 3 – Table 1(j)(9)(iii) of TV Permit (Part 2-Ren 1-Rev 4), it states:

*"The Owner/Operator shall conduct daily qualitative stack observations to determine the presence of any visible emission when the unit is in operation.*

*(1) If visible emissions are observed, the Owner/Operator shall take corrective actions and/or conduct a visible observation in accordance with Paragraph (B) below."*

16. In Condition 3 – Table 1(j)(9)(iv) of TV Permit (Part 2-Ren 1-Rev 4), it states:

*"Observation records shall be maintained and made available to the Department upon request."*

17. In Condition 3 – Table 1(a)(3)(i)(B) of TV Permit (Part 3-Ren 2-Rev 4), it states:

*“PM<sub>10</sub> emissions including H<sub>2</sub>SO<sub>4</sub> shall not exceed the following limits: 0.0104 lb/mmBtu heat input when firing natural gas or refinery fuel gas in Boiler 80-2 and 80-3.”*

18. In Paragraph 137 of Civil Action No. H-01-0978 (the Motiva Consent Decree) between Motiva, the U.S. EPA, and the state of Delaware lodged on March 21, 2001 in the U.S. District Court for the Southern District of Texas it states in part:

*“Motiva shall re-route all SRP [Sulfur Recovery Plant] sulfur pit emissions from the refineries identified at Paragraph 5, such that all sulfur pit emissions to the atmosphere are either eliminated, or included and monitored as part of the applicable SRP’s emissions that meet the NSPS Subpart J limit for SO<sub>2</sub>, a 12-hour rolling average of 250 ppmvd SO<sub>2</sub> at 0% oxygen, as required by 40 C.F.R. §60.104(a)(2).”*

### **CONCLUSION**

Based on the above, the Department has concluded that Respondent committed the following violations:

1. Respondent is found to be in violation of the H<sub>2</sub>SO<sub>4</sub> emission limit of 3.2 lbs./hr. set forth in Condition 3-Table 1(j)(8)(i) of TV Permit (Part 2-Ren 1-Rev 3), when the stack test conducted on August 14, 2019, of the SRU, SCOT I, Incinerator showed average H<sub>2</sub>SO<sub>4</sub> emissions of 3.76 lbs./hr.
2. Respondent is found to be in violation of 7 Del. C. §6003(a)(1) and Section 2.1 of 7 DE Admin. Code 1102 for the unpermitted release of 4,250 lbs. of propane, 2,000 lbs. of propylene, and 820 lbs. of isobutane as a result of the leak from the Poly Unit Reactor during the Poly Unit restart on November 27, 2019.
3. Respondent is found to be in violation of 7 Del. C. §6003(a)(1) and Section 2.1 of 7 DE Admin. Code 1102 for the unpermitted release of H<sub>2</sub>S from a sulfur pit at the SRA discovered on February 13, 2020, and continued through completion of the repair on November 20, 2020.

4. Respondent is found to be in violation of Condition 3 – Table 1(j)(1)(i)(I) of TV Permit (Part 2-Ren 1-Rev 4) and Paragraph 137 of the March 21, 2001, Motiva Civil Action No. H-01-0978 for failure of the steam eductor system to operate such that all sulfur pit vapors were sent to the Claus reactors from February 13, 2020 through completion of the repair on November 20, 2020.
5. Respondent is found to be in violation of Condition 3 – Table 1(j)(9)(iii) and (iv) of TV Permit (Part 2-Ren 1- Rev 4) and 3(c)(2)(ii)(C) of TV Permit (Part 1-Ren 2-Rev 4), for failure to identify as deviations, the failure to record visible emissions from the eductor stack and report such recordkeeping oversight in the semi-annual deviation reports for the first and second semi-annual periods in 2020, and the annual compliance certification for 2020.
6. Respondent is found to be in violation of 7 *Del. C.* §6003(a)(1) and Section 2.1 of 7 DE Admin. Code 1102, for the unpermitted emissions of 360 lbs. of SO<sub>2</sub>; 235 lbs. of NO<sub>x</sub>; 46 lbs. of PM; 18 lbs. of CO as a result of the HDS Train 4 Heater fire on March 11, 2020.
7. Respondent is found to be in violation of Section 2.0 of 7 DE Admin. Code 1114 and Condition 3-Table 1(a)(4)(i) of TV Permit (Part 1-Ren 2-Rev 4), by having visible emissions with an appearance greater than 20 percent opacity of more than three minutes in any one hour or more than 15 minutes in any 24 hour period, as a result of the HDS Train 4 Heater fire on March 11, 2020.
8. Respondent is found to be in violation of the PM<sub>10</sub> emission limit of 0.0104 lbs./mmBtu set forth in Condition 3 – Table 1(a)(3)(i)(B) of TV Permit (Part 3-Ren 2-Rev 4), when the stack test conducted on Boiler 2 on July 14, 2020, showed average PM<sub>10</sub> emissions of 0.0169 lbs./hr.
9. Respondent is found to be in violation of 7 *Del. C.* §6003(a)(1) and Section 2.1 of 7 DE Admin. Code 1102, for unpermitted emissions of 3,800 lbs. of butane, 900 lbs. of

- isobutane, and 650 lbs. of pentane as a result of the leak from the Butamer Feed Surge Drum of the Butamer Unit during a purge of oxygen performed as part of the restart process on September 10, 2020.
10. Respondent is found to be in violation of 7 *Del. C.* §6003(a)(1), Section 2.1 of 7 DE Admin. Code 1102, Section 2.0 of 7 DE Admin. Code 1111, and Conditions 3-Table 1(da)(1)(i)(H); and (da)(5)(i)(B) of TV Permit (Part 2-Ren 1-Rev 4), for the unpermitted release of 15,000 lbs. of SO<sub>2</sub>, 930 lbs. of NH<sub>3</sub>, 140 lbs. of H<sub>2</sub>S, 110 lbs. of HCN, and 180,000 lbs. of CO on October 26, 2020, when the FCU COB tripped offline and flue gas was routed through the bypass stack.
  11. During the outage of the FCU COB and consequent bypassing of the WGS train from 9:54 a.m. to 3:42 p.m. on October 26, 2020, Respondent continued to operate the FCU which resulted in the release of air contaminants to the atmosphere. Therefore, Respondent is in violation of Condition 3-Table 1(da)(1)(i)(C) of TV Permit (Part 2-Ren 1-Rev 4).
  12. Respondent is found to be in violation of Section 2.0 of 7 DE Admin. Code 1114 and Condition 3-Table 1 (da)(11)(i) of TV Permit (Part 2-Ren 1-Rev 4), for allowing the emission of smoke with an opacity greater than 20% for more than three minutes in an hour and 15 minutes in a 24 hour period during the FCU COB outage on October 26, 2020.
  13. Respondent is found to be in violation of 7 *Del. C.* §6003(a)(1) and Section 2.1 of 7 DE Admin. Code 1102, for the unpermitted release during flaring episodes that occurred a total of four days between July 1, 2019, and December 31, 2020. Specifically, Respondent released 250 lbs. of SO<sub>2</sub> on July 31, 2019; 300 lbs. of SO<sub>2</sub> on October 23, 2019; 200 lbs. of SO<sub>2</sub> on March 1, 2020; and 4,000 lbs. of SO<sub>2</sub> on May 16, 2020.

## ***ASSESSMENT OF PENALTY***

Pursuant to 7 *Del. C.* § 6005(b)(3), the Secretary may impose an administrative penalty of not more than \$10,000 for each day of violation detailed in this Order. In assessing the administrative penalty, 7 *Del. C.* § 6005(b)(3) instructs the Secretary to consider the following factors: (1) the nature, circumstances, extent, and gravity of each violation of the violation, or violations; (2) the ability of the violator to pay; (3) any prior history of such violations; (4) the degree of culpability; (5) the economic benefit or savings (if any) resulting from each violation; and (6) such other matters as justice may require. A brief discussion of these factors is set out below.

Having considered these factors, an administrative penalty of \$285,000 is assessed for the violations identified in this Order.

1. The Nature, Circumstances, Extent and Gravity of the Violation, or Violations:

The nature, circumstances, extent, and gravity of the violations are significant. The events of flaring, leaks, and fires detailed in this Order caused the unpermitted release of 180,000 lbs. of CO, 20,110 lbs. of SO<sub>2</sub>, 12,420 lbs. of VOC, up to 5,328 lbs. of H<sub>2</sub>S, 930 lbs. of NH<sub>3</sub>, 235 lbs. of NO<sub>x</sub>, 110 lbs. of hydrogen cyanide, 46 lbs. of PM, and visible emissions exceeding the regulatory limit. The total amounts emitted of these regulated permits are cumulatively substantial. Additionally, individual violations demonstrate substantial violations of the permitted limits—namely, the stack test of the Sulfur Recovery Unit indicating emissions of H<sub>2</sub>SO<sub>4</sub> at 18% above the permitted limit, and the stack test of Boiler 2 indicating emissions of PM<sub>10</sub> at 63% above the permitted limit. Continuous Emissions Monitoring Systems (CEMS) provide real time emission data; an emission exceedance monitored by a CEMS can generally be fixed promptly. However, some of the violations herein are violations of periodic or yearly stack tests which provide a snapshot of emission releases under the observed testing scenario. Stack test data which indicates elevated emissions are especially important because the data is used to calculate future emissions. Further,

violations contributed to, or exacerbated by operator error or faulty assumptions, as in the case of the fire at the Butamer Unit, or that were substantially similar to prior violations, as in the case of the fire at the Hydro-desulfurizer Train, are considered to be more grave violations. Another circumstance that suggests a higher penalty occurs when corrective action is not taken immediately. Respondent took some corrective action upon the initial discovery of the SRA H<sub>2</sub>S leak in February, but repair activities did not resolve the leak until nine months after its discovery. Thus, the nature, circumstances, extent and gravity of these violations are significant.

2. Respondent's Ability to Pay:

The record contains no information that the respondent does not have the ability to pay the administrative penalty assessed. Furthermore, the size and nature of Respondent's operations indicates Respondent has the ability to pay the administrative penalty imposed and that the penalty is sufficient to deter Respondent from future violations.

3. Prior History of Violations:

Respondent has had prior violations of these specific permit and regulatory requirements related to the flaring events, the FCU COB outage, and the HDS Train 4 fire. The leaks, and the Butamer fire were not repeat events. Boiler 2 and the SRU have not had any stack test failures during Respondent's operation of the Refinery.

4. Degree of Culpability:

Factors DNREC considered that impact the Respondent's degree of culpability include whether it has employed reasonable measures to assure that violations that occur are brief in nature and have minimal impact on surrounding areas, and whether Respondent has taken sufficient measures to avoid repeat violations.

5. Economic Benefit or Savings Resulting from the Violation(s):

Although there may be circumstances where reduced throughput or other actions might be necessary to mitigate emissions, in these instances DNREC did not believe that economic benefit was a factor impacting the penalty assessment.

6. Such Other Matters as Justice May Require:

The assessed penalty is believed to be appropriate, proportional and sufficient to deter future violations.

Therefore, pursuant to the provisions of *7 Del. C. §6005(b)(3)*, this is written notice to Respondent that on the basis of its findings, the Department is assessing Respondent an administrative penalty of \$285,000 for the violations identified in this Assessment and Order.

Respondent shall submit a check to the Department in the amount of \$285,000 to pay the penalty within 30 days from the receipt of this Assessment and Order. The check shall be made payable to the "State of Delaware" and shall be directed to: Valerie S. Edge, Deputy Attorney General, Department of Justice, Environmental Unit, 102 W. Water Street, Dover, Delaware 19904.

The Department reserves the right to take additional enforcement actions regarding these and other violations by Respondent, including but not limited to one or more of the following: an action under the authority vested in the Secretary by *7 Del. C. Chapter 60 and 7 DE Admin. Code 1100* to revoke Respondent's air quality permit(s) for the State of Delaware, an action under *7 Del. C. §6005(b)(1)* seeking penalties for past violations, an action under *7 Del. C. §6005(b)(2)* seeking penalties for continuing violations, an action in the Court of Chancery pursuant to *7 Del. C. §6005(b)(2)* seeking a temporary restraining order or an injunction, and the imposition of civil penalties and recovery of the Department's costs and attorney's fees pursuant to *7 Del. C. §§6005(b)(3) & (c)(1)*.

## ***PUBLIC HEARING AND APPEAL RIGHTS***

This Assessment and Order is effective and final upon receipt by Respondent. Pursuant to 7 *Del. C.* §6008, any person whose interest is substantially affected by this action of the Secretary may appeal to the Environmental Appeals Board within 20 days of the receipt of the Assessment and Order. In the alternative, Respondent may, pursuant to 7 *Del. C.* §6005(b)(3), request a public hearing on the penalty assessment and Order, within 30 days of receipt of the Assessment and Order. A hearing would be conducted pursuant to 7 *Del. C.* §6006, and the Secretary's Order following the hearing would be subject to appeal, pursuant to 7 *Del. C.* §6008, by any person substantially affected.

To submit an appeal to the Environmental Appeals Board, there is a \$50.00 filing fee, with a check made payable to the: "Environmental Appeals Board" and sent to:

Department of Natural Resources and Environmental Control  
Office of the Secretary  
Attn: Assistant to the Environmental Appeals Board  
89 Kings Highway  
Dover, DE 19901  
Phone: (302) 739-9000

If you want a hearing and opportunity to contest this Assessment and Order, you must submit your request, in writing, within 30 days of receipt of this Assessment and Order to:

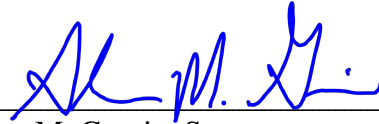
Department of Natural Resources and Environmental Control  
Office of the Secretary  
89 Kings Highway  
Dover, DE 19901  
Phone: (302) 739-9000



Respondent may waive its right to request a hearing or to file an appeal by signing the waiver attached herein and prepaying the penalty. If no hearing is requested or appeal filed as described above and the administrative penalty of \$285,000 is not paid within the time frame above, DNREC may immediately take action to collect the above amount.

9/22/21

Date



Shawn M. Garvin, Secretary  
Department of Natural Resources  
and Environmental Control

cc: Valerie S. Edge, Deputy Attorney General  
Angela Marconi, P.E., Director

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***WAIVER OF STATUTORY RIGHT TO A HEARING***

**Delaware City Refining Company, LLC** hereby waives its right to a hearing and its opportunity to appeal or contest this Assessment and Order and agrees to the following:

**Delaware City Refining Company, LLC** will pay the administrative penalty in the amount of \$285,000 by sending a check payable to the “State of Delaware” within 30 days of receipt of this Assessment and Order. The check shall be directed to Valerie S. Edge, Deputy Attorney General, Department of Justice, 102 W. Water Street, Dover, DE 19904; and

**Delaware City Refining Company, LLC**

Date: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_