



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

DATE: AUG 02 2019

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Rain CII Carbon LLC, Robinson, Illinois

FROM: Marie St. Peter, Environmental Engineer
AECAB (MN/OH)

THRU: Dakota Prentice, Acting Section Chief
AECAB (MN/OH)

TO: File

BASIC INFORMATION

Facility Name: Rain CII Carbon LLC

Facility Location: 12187 E. 950th Avenue, Robinson, Illinois

Date of Inspection: May 30, 2019

EPA Inspector(s):

1. Marie St. Peter, Environmental Engineer

Other Attendees

1. Dan Fearday, Plant Manager, Rain CII Carbon LLC
2. Decoda Halter, Safety, Health and Environmental, Rain CII Carbon LLC

Contact Email Address: decoda.halter@raincarbon.com, dan.fearday@raincarbon.com

Purpose of Inspection: Clean Air Act Inspection

Facility Type: Petroleum Coke Calciner

Arrival Time: 10 AM

Departure Time: 1 PM

Inspection Type:

- ☒ Unannounced Inspection

☐ Announced Inspection

OPENING CONFERENCE

- ☒ Credentials Presented
- ☒ CBI warning to facility provided

The following information was obtained verbally from Mr. Fearday unless otherwise noted.

Process Description:

Rain CII Carbon LLC (the facility) is a petroleum coke calciner. The facility's raw material is petroleum coke. A major source of its incoming petroleum coke is from Marathon Petroleum Corporation, which shares a fenceline with the facility. The facility also receives petroleum coke from other sources due to customer needs.

At the facility, petroleum coke is delivered via railcar or dump truck. The material is then separated onto varying "green piles," which are separated out by chemical speciation. Once a customer order is ready to be produced, the petroleum coke from several green piles is blended together and loaded into a bin. From the bin, the petroleum coke blend is transferred to a feed belt and sent through one of two kilns. Once calcined, the material is quenched with water in a rotary cooler. After cooling, the product is loaded into a railcar via a bucket elevator.

Staff Interview: Primary specifications that the facility's customers care about are sulfur, vanadium and nickel content. This can be due to production-driven or environmental regulatory requirements. The calcining process occurring within a kiln can be broken up into the following three successive stages: 1) drying; 2) volatile material removal; and 3) densification. Each kiln operates at between 2300 to 2500 degrees fahrenheit, which is primarily sustained from the heat of the coke gas produced during the calcining process. There is also a natural gas burner at the end of both kilns to help the facility get the density it needs for its products. Both kilns operate within a feed rate range of 18 and 27.9 tons per hour. When asked, Mr. Fearday stated that the current average operating feed rate for Kiln #1 was 27.9 tons per hour. For Kiln #2, it was stated that the average operating feed rate was between 24 and 26 tons per hour, depending on the product being produced.

Coke gas flows countercurrent to the petroleum coke going through the calciner, and is treated by both a pyroscrubber and baghouse. The use of these technologies results in the treatment of volatile organic compounds and particulate matter. There is also a baghouse for particulates that become entrapped in the quench steam. There are no sulfur dioxide (SO₂) controls at the facility. All SO₂ emissions are emitted from the pyroscrubber stacks and the facility is allowed to emit up to 2000 parts per million SO₂ per stack. In total, there are 4 stacks at the facility; all of which have an opacity limit of 30%. All facility staff are Method 9 certified.

Mr. Fearday stated that he believed that the 27.9 tons per hour feed rate was derived from showing compliance with the 2000 ppm SO₂ limit during testing, but that it also may be due to limitations of the kiln itself. At the time of inspection, the facility's most recent SO₂ compliance

testing occurred in May 2019. Additionally, during these compliance tests, the facility also verified the accuracy of an equation which was developed to estimate its SO₂ emissions.

To be able to use this equation, the facility must take grab samples every day. Mr. Fearday stated that they take 12 grab samples per day (so once every two hours), and the resultant composite sample analysis is then used to determine the facility's SO₂ emissions.

In 2017, the facility performed a stack test to demonstrate compliance with its particulate matter emission rate in the situation where a rotary cooler's baghouse was down and needed to be diverted through a kiln's baghouse and pyroscrubber.

Regarding yearly maintenance, portions of each kiln are patched every year. The kilns' major repairs are staggered, though, so that only one kiln receives major repairs per year. In determining what work needs to be done during a major turnaround, the facility uses thermography and performs modeling. When asked, Mr. Fearday stated that the facility will try to install some new technology occasionally during turnarounds. For instance, they installed needles in the rotary coolers and then a nose ring in the kilns. They also started to use castable refractory in a section of the kilns. Mr. Fearday said he couldn't quantify any improvements made by the castable, but stated that it was probably installed three to four years ago.

Mr. Fearday explained to EPA that the facility has redefined its startup period. It is now currently defined as when the facility starts feeding petroleum coke into the kiln. This occurs between 48 and 56 hours after restarting the kiln using natural gas burners. The facility determined that this time period was appropriate to start calcining petroleum coke based off of information from its refractory manufacturer.

Additionally, EPA and Mr. Fearday discussed the facility's annual emissions over the past few years. Mr. Fearday stated that in 2016, its emissions were down. In 2017, its emissions then increased. This increase in emissions was due to an increase in demand and wanting to make sure its customers had plenty of product. Mr. Fearday stated that off the top of his head, the facility's 2018 were, and its 2019 would be, lower than its 2017 emissions. He stated that in general those emissions are somewhere between its 2016 and 2017 emissions. Mr. Fearday has also given that Illinois Environmental Protection Agency a lot of daily operational data recently so that it can model the surrounding geographic area's compliance with EPA's current SO₂ national ambient air quality standard.

TOUR INFORMATION

EPA toured the facility: Yes

Data Collected and Observations: EPA toured the facility, including its composite sample lab and operational control room (which were the same room). In this room it was noted that the average feed rate for kiln's #1 and #2 was 27.9 tons per hour; and the pyroscrubber was operating at a temperature above 1800 degrees fahrenheit. Additionally, EPA went out to the particulate matter monitor located on site. The monitor read a particulate matter concentration of 0.028 milligrams per meter cubed.

Photos and/or Videos: were not taken during the inspection.

Field Measurements: were not taken during this inspection.

RECORDS REVIEW

1. Robinson CII Carbon LLC Composite Sample to SO₂ ppm Log – received, but not reviewed, on site;
2. May 29, 2017 Robinson SO₂ PM Stack Test - received, but not reviewed, on site

CLOSING CONFERENCE

Requested documents: At the time of inspection, no additional documents were requested.

SIGNATURES

Report Author:  Date: 08/02/2019

Section Chief:  Date: 8/2/19