



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Report Title: Clean Air Act Inspection of Mountain State Carbon LLC
Inspection Date(s): 06/15/2021-06/16/2021
Regulatory Program(s): SIP/Title V/NSPS/NESHAP
Company Name: Mountain State Carbon LLC
Facility Name: Mountain State Carbon Follansbee Plant
Facility Location: 1851 Main Street
Follansbee, WV 26037
Latitude: 40.34361 **Longitude:** -80.60667
County/Parish: Brooke County
AFS Number: WV00000900002
Permit Number: R30-00900002-2021
NAICS Code: 324199 **SIC:** 2999
Unique Project #: 3E21CA068A

Facility Representatives:	Point of Contact
Patrick Smith, Environmental Manager Phone: (804) 527-5646 Contact: patrick.smith@mscarbonllc.com	☒
Rich Zavoda, Environmental Group Cleveland Cliffs Phone: (330) 659-9163 Contact: rich.zavoda@clevelandcliffs.com	☐
Katie Kistler, Environmental Manager Cleveland Cliffs Phone: (513) 425-2972 Contact: katie.kistler@aksteel.com	☐

EPA Inspectors:
Bruce Augustine, Environmental Scientist Region III, 3ED21
Phone: (215) 814-2131 Contact: augustine.bruce@epa.gov
Nicholas Bobbs, Environmental Engineer, EPA Headquarters
Phone: (202) 564-0726 Contact: bobbs.nicholas@epa.gov

State/Local Inspectors:
Brian Tephabock, WVDEP Air Quality
Phone: (304) 288-6308 Contact: brian.s.tephabock@wv.gov
Al Carducci, WVDEP Air Quality
Phone: (304) 312-1501 Contact: alfred.a.carducci@wv.gov

EPA Lead Inspector

Signature

Bruce Augustine
1650 Arch Street (3ED21)
Philadelphia, PA 19103-2029

Date

Supervisor

Signature

Kristen Hall

Date

Table of Contents

<u>Section</u>		<u>Page</u>
I	Introduction.....	3
A	Summary of the Facility.....	3
B	Inspection Opening Conference.....	4
II	Site Activity/Process Information.....	4
III	Observations.....	6
IIII	Records Review.....	10
V	Closing Conference.....	11
VI	List of Attachments.....	12

I. Introduction

The United States Environmental Protection Agency (EPA) conducted a Clean Air Act (CAA) inspection at Mountain State Carbon LLC's (MSC or Facility) to verify compliance with applicable State and Federal regulations. The West Virginia Department of Environmental Protection (WVDEP) was notified of the inspection on June 1, 2021 via email. On June 11, 2021, EPA notified the Facility of the planned inspection via phone and email. EPA emailed a list of records for review to Patrick Smith, prior to the inspection (see Attachment 1). These records are listed in the Records Review section of the report.

A. Summary of the Facility

The Facility is located at 1851 Main Street, Follansbee, WV 26037. The MSC Follansbee Plant has operated at this location for over 100 years. The company originally operated as Wheeling Steel and then Wheeling Pitt Steel, supplying foundry coke to steel plants in Steubenville, OH. The Facility became Mountain State Carbon in 2005 and began shipping half of its coke to Dearborn, MI. In 2014, the facility was acquired by AK Steel and then in March 2020 the company became wholly owned by Cleveland Cliffs. Cleveland Cliffs is headquartered in Cleveland, OH and is the largest integrated steel manufacturer in the United States.

MSC currently operates four coke oven batteries to turn coal into coke. Coal arrives via barge on the Ohio River and is fed into the battery ovens where it is heated to produce coke. MSC formerly produced foundry coke for use in steel manufacturing, however, in 2021 the facility switched to making furnace coke for combustion. In addition, the coal tar that is manufactured is now sent off-site rather than to the adjacent former Koppers facility. Recovered coke oven gas is sent to the byproducts plant for processing into other products such as ammonia, tar, naphthalene, etc.

The Facility received a Clean Air Act (CAA) Title V permit (R30-00900002-21021) from WVDEP on 2/9/2021 and effective on 2/23/2021.

MSC is classified as major source for NO_x, SO₂, VOC, PM, and hazardous air pollutants (HAP). The Facility is subject to, or potentially subject to the following federal regulations:

- 40 CFR Part 61 Subpart L; National Emission Standards for Hazardous Air Pollutants from Coke Oven By-Product Recovery Plants
- 40 CFR Part 63 Subpart CCCCC; National Emission Standards for Hazardous Air Pollutants from Coke Oven Pushing, Quenching and Battery Stacks
- 40 CFR Part 63 Subpart DDDDD; National Emission Standards for Hazardous Air Pollutants from Industrial, Commercial, and Institutional Boilers and Process Heaters at Major Sources
- 40 CFR Part 61 Subpart V: National Emission Standards for Equipment Leaks (Fugitive Emissions)
- 40 CFR Part 61 Subpart FF; National Emission Standards for Hazardous Air Pollutants from Benzene Waste Operations

- 40 CFR Part 63 Subpart ZZZZ; National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines
- 40 CFR Part 60 Subpart IIII: New Source Performance Standards for Stationary Compression Ignition Internal Combustion Engines
- 40 CFR Part 60 Subpart JJJJ: New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines

B. Inspection Opening Conference

At 8:55AM on June 15, 2021, EPA inspectors arrived at the Facility for a CAA Inspection and conducted a brief opening conference. MSC was represented by personnel from the facility, as well as, representatives of their parent company (Cleveland Cliffs), environmental consultant (Trinity) and LDAR contractor (Montrose). Also, several inspectors from the WVDEP were also present. A sign-in sheet was circulated and is maintained in the inspection file. EPA inspectors introduced themselves and explained that the point of the site visit was to conduct a CAA inspection to determine the facility's compliance with certain sections of their permit and applicable regulations. Furthermore, EPA explained that the inspection would involve three inspection teams: 1) The use of a Geospatial Monitoring of Air Pollution (GMAP) vehicle to conduct monitoring of concentrations of benzene, hydrogen sulfide, and methane both inside and outside the fence line; 2) Conduct visual monitoring of the coke oven batteries to determine if opacity exceeds allowable limits; and 3) Conduct LDAR monitoring using both a Flame Ionization Detector (FID) and optical gas imaging using a FLIR camera. Additionally, EPA informed the facility representatives of their right to claim any confidential business information (CBI). At that time, Patrick Smith, Environmental Manager, did not claim any photos or documentation as CBI. Prior to the inspection, EPA provided MSC with a CBI notice which explained CBI and MSC's rights to claim CBI. Mr. Smith indicated during the opening meeting that MSC was not prepared to sign the notice. Following introductions and the CBI discussion, MSC provided a brief safety briefing.

II. Site Activity/Process Description

MSC operates four coke oven batteries to convert coal to coke. MSC Batteries 1, 2, 3, and 8 all perform the same function. Batteries 1-3 are 3m tall while Battery 8 is 6m tall. The ovens in all four batteries are 18in wide. Batteries 1 & 2 have 47 ovens, Battery 3 has 51 ovens and Battery 8 has 79 ovens. MSC refers to Batteries 1-3 as the "old block" and Battery 8 as "new block". MSC stated that they are currently operating on an extended coking schedule. This means that coking times are prolonged to maintain production at current levels and to maintain the ovens. All four batteries are designed for a 16hr coking time, however, during the inspection, Battery 8 was operating on a 29hr schedule and Batteries 1-2 were operating on a 48hr coking schedule. MSC indicated that coking times are driven by market demands and oven maintenance. Two-thirds of

the coke made at the Facility is made in Battery 8. MSC stated that all of the batteries are operating, however, Battery 3 has been operating in hot idle since 2012.¹

As mentioned earlier, coal arrives by barge and is conveyed to coal piles where blending of coal takes place to homogenize the feedstock to the battery. Coal is conveyed to hoppers on the top of the batteries before being charged into one of the ovens. The ovens operate at several thousand degrees and are charged on a rotating schedule determined by MSC.² The coke ovens are fired using excess coke oven gas, which is generated during the process. There is a collection hood one side of the old block which collects gases during the pushing process and routes them to a baghouse for control. Battery 8 has collection hoods on both sides of the ovens and gases are routed to a venturi scrubber for control. Once the coking cycle is complete, the door on one side of the oven is opened and a ram pushes the coke out of the other side into a car, where it is then transported to a quench tower for cooling. The old block has a single quench tower while new block has two quench towers. After quenching, finished coke is transported via rail either to Cleveland Cliffs plant in Cleveland, OH or to the Dearborn, MI plant, while fine coke is trucked off-site.

Coke oven gas generated during the coking process is sent to the by-products plant for further processing. The flow of the coke oven gas from the batteries to the by-products plant is controlled by exhausters. The coke oven gas is cooled using a quenching liquid and as the coke oven gas cools, tar drops out and is sent to the tar decanter system to be recovered as a product. The liquid and gas streams are separated in the downcomer before being processed separately, Ammonia is also removed from the gas stream using sulfuric acid to produce ammonium sulfate for sale. Napthalene is also removed from the gas stream by cooling the coke oven gas with a wash oil which is then stripped with steam and recirculated. BTEX compounds are also removed from the gas stream in the same manner. Any excess coke oven gas which is not processed is sent to the main flare for combustion. The flare is also used during upset conditions to combust coke oven gas. Wastewater from the by-products plant is sent to the onsite wastewater treatment plant where lye is used as the caustic. Treated coke oven gas is sent back to the battery ovens and boilers for combustion. MSC stated that the Title V permit contains an H₂S limit of 50 gr/dscf for coke oven gas being combusted in ovens or boilers. MSC uses boilers to produce steam for the by-products plant and none of the boilers uses add-on emission controls to limit emissions to the atmosphere.

The opening conference concluded at approximately 11:00AM and EPA discussed with MSC which teams would begin inspecting which sections of the facility.

¹ It was later learned that half of Battery 2 is also in hot idle and that in the week prior to the inspection half of Battery 1 had been taken down for due to nearby maintenance.

² A copy of the pushing schedule for each day of the inspection was requested during the opening conference.

III. Observations

At approximately 11:00AM the EPA inspection team broke into three inspection teams: GMAP (Scott Hamilton and Katherine Haile), LDAR (Bruce Augustine and Nicholas Bobbs), Coke Oven Batteries (Patrick Miller and Cody Yarbrough). Each inspection team was accompanied by representatives of MSC. The WVDEP personnel present moved between the inspection groups. Still photographs were taken by all three inspection teams over the course of the inspection and are summarized in the photo logs (Attachment 2 contains photos taken during the LDAR inspection while Attachment 3 contains opacity observations at the batteries). Bruce Augustine and Nicholas Bobbs also operated FLIR cameras at various points during the inspection and a list of the videos taken are included as Attachment 4 to this report.

GMAP Monitoring

Day 1: June 15, 2021

The GMAP uses a Picarro G2204 cavity ringdown spectroscopy (CRDS) analyzer (SN 2267-BFADS2013) to measure H₂S and CH₄ and a DUVAS DV3000 differential ultra-violet absorption spectrometer (DUVAS) (SN UV3000-2016067-DV1019) to measure C₆H₆. The collected data are integrated with locational and meteorological data, when available, under a common time stamp using the specially designed software to quantify air pollutant concentrations and source trajectories. A full description of the GMAP system is included in the GMAP report. This report will be forwarded to MSC under separate cover.

Immediately following the opening conference, at approximately 11:00 AM EDT, the GMAP began monitoring around the perimeter of MSC and then continued to the interior roadways. A MSC representative was present in a separate vehicle throughout the entirety of the GMAP monitoring. Several mobile and stationary monitoring files were collected. Two physical samples were collected in air sampling canisters. All GMAP results are detailed in the GMAP report.

Day 2: June 16, 2021

The GMAP arrived and immediately began monitoring at approximately 7:45 AM EDT. The GMAP began monitoring around the perimeter of MSC and then continued to the interior roadways. A MSC representative was present in a separate vehicle throughout the entirety of the GMAP monitoring. Several mobile and stationary monitoring files were collected. One physical sample was collected in an air sampling canister. All GMAP results are detailed in the GMAP report.

Coke Oven Battery Monitoring

Day 1; June 15, 2021

Visible emissions observations were conducted on charging, pushing, and quenching operations on coke ovens for Batteries 1, 2, and 8. At the time of the inspection, approximately half of the coke ovens at Battery 1 was non-operational due to maintenance being conducted on supporting framework for associated offtake piping. Additionally, approximately half of the coke ovens at Battery 2 and all of Battery 3 were on “hot idle,” where the ovens are still heated but not used for processing coke and have been in this phase since 2012. During both days, EPA was accompanied by MSC personnel and the contractor used by MSC to conduct the visible emissions observations required by MSC’s permit.

Onsite and offsite visible emissions observations were conducted in accordance with EPA Alternative Method 082 on the Batteries 1 and 2 in the morning. EPA observed the following coke oven pushes:

- 52-1;
- 44-1; and
- 4-2.

Onsite and offsite visible emissions observations were conducted in accordance with EPA Alternative Method 082 on the Battery 8 in the afternoon. EPA observed the following coke oven pushes:

- A-20; and
- B-20.

During the visible emission observations, EPA also noted the following coke-side doors were leaking: B18, B14, A18, A16, C24, C18, and C16.

Day 2: June 16, 2021

Onsite and offsite visible emissions observations were conducted in accordance with EPA Alternative Method 082 on the Batteries 1 and 2 in the morning. EPA observed the following coke ovens:

- 33-1;
- 35-1;
- 41-1;
- 1-2;
- 43-1;
- 45-1;
- 5-2; and
- 15-2.

During the visible emission observations, EPA also noted the following push-side doors were leaking on Battery 2: 16-2, 18-2, 24-2, and 26-2.

Onsite and offsite visible emissions observations were conducted in accordance with EPA Alternative Method 082 on the Battery 8 in the afternoon. EPA observed the following coke ovens:

- C-2; and
- A-4.

During the visible emission observations, EPA also noted the following coke-side doors were leaking: B2, B23, B25, B27, A27, A23, and C24.

In addition to visible emissions from the coke ovens and topside of the batteries, visible emissions from the combustion stacks for Batteries Nos. 1, 2, and 8 were observed in the afternoon on June 16, 2021. General digital photographs and videos were taken during each of the visible emissions observations and logged. Onsite and offsite visible emissions observations were also conducted in accordance with EPA Alternative Method 082 for visible emission from the combustion stack for Battery No. 8.

Leak Detection & Repair Program

Day 1: June 15, 2021

After exiting the opening conference, EPA inspectors conducted a daily EPA Method 21 calibration on a Thermo Instruments TVA2020 FID (Serial #202015010783) using calibration gases with concentrations of zero, 500ppm, and 10,000ppm CH₄. EPA inspectors also turned on and cooled down FLIR GF320 optical gas imaging camera to conduct LDAR surveys.

At 11:33AM, EPA inspectors, MSC personnel, and MSC's third party contractor (Montrose) arrived at the by-products plant. Montrose conducts all on-site LDAR monitoring at the Facility, including initial monitoring, periodic monitoring, and repair verification monitoring. MSC and Montrose stated that the only section of the Facility where LDAR is conducted is the by-products plant. MSC stated that LDAR is not conducted at the WWTP. MSC informed EPA inspectors that due to the fact most LDAR components are in benzene service, respirators are required in most areas of the by-products plant. Therefore, EPA would not be able to conduct comparative LDAR monitoring in most sections of the by-products plant. MSC indicated that there are approximately 3,000 components in the LDAR program, Montrose conducts monthly monitoring of pumps and quarterly monitoring at valves (leak definition of 10,000ppm). In addition, components in heavy liquid service are monitored quarterly using EPA Method 21. MSC does not utilize OGI to conduct any LDAR monitoring.

EPA inspectors observed LDAR tags on components and monitored several valves with the TVA2020. EPA observed the tar decanters which are across from the old block. Emissions were recorded using the FLIR camera from the top of ovens 44/45 on Battery 1. EPA also observed three final liquor cooling towers. The inspection team broke for lunch at 1:20PM.

EPA inspectors resumed the walkthrough inspection at 2:57PM at Battery 8. Emissions were observed and recorded with the FLIR camera at the Battery 8 combustion stack, the top of oven 22, and the venturi scrubber.

EPA inspectors returned to the by-products plant and continued the walkthrough. Emissions were recorded at a pump in the by-products section.

EPA Inspectors observed and recorded steady VOC emissions with the FLIR camera from a small pipe on the roof of the 'light oil' buildings. Facility personnel told the EPA inspectors that the pipe was connected to the heat exchanger or condenser associated with the light oil operations. Facility personnel said that light oil condenser had not been in operation since 2015. Facility personnel said that the stack which had shown VOC emissions was connected to the 'clean' side of the condenser and that emissions from the 'dirty' side of the condenser, which was still connected to the blanket gas manifold of the byproducts area, must have leaked into the clean side and out the stack. At the end of the inspection, facility personnel informed EPA that they had blanked off the light oil condenser in two locations and confirmed with FLIR camera that no VOC emissions were coming from the stack.

The EPA inspection team returned to the main building at 4:10PM to summarize the day and confirm logistics for the second day of inspection. EPA reviewed the photographs and FLIR videos obtained during the LDAR walkthrough with MSC. EPA also provided a summary of GMAP monitoring conducted within the MSC fenceline and discussed the two summa canister samples obtained. EPA also summarized the opacity observations at the old and new block and the setup of an opacity camera on the second day of inspection. This concluded the first day and EPA exited the Facility at 5:00PM.

Day 2: June 16, 2021

EPA arrived at MSC at 7:55AM and held a brief opening meeting to confirm which sections of the Facility would be inspected. EPA requested another copy of the LDAR database in MS Access format. The database should include the component inventory and the monitoring history of each component. MSC indicated that they would need to discuss this request with their contractor, who maintains their monitoring history.

At 8:14AM, EPA commenced calibration of a TVA2020 FID for additional LDAR monitoring. EPA inspectors then resumed the walkthrough of the by-products plant with MSC and Montrose. Emissions were observed and recorded with the FLIR camera at a pump on the phenol sump. Emissions were also observed and recorded from the hopper at Tar Decanter #4. The tar decanters are open to the atmosphere and appeared to vent emissions. While downwind of the tar decanters, the EPA Inspector's 4-gas monitor alarmed that the low alerts for CO and H2S had been exceeded. CO had reached 11 ppm and H2S had reached 15 ppm. After exiting from the area, EPA Inspectors returned and measured emissions from the bottom of tar decanter #4 with a TVA 2020 Flame Ionization Detector (FID). VOC levels measured 5 ft downwind of the bottom

opening of tar decanter #4 were up to 2,000 ppm as methane. MSC stated that the pumps on site are not part of the LDAR program and are not in benzene service. They are monitored as part of best management practices.

The walkthrough continued in the by-products plant with the observation of the light oil building and cooler 150. FLIR was obtained at both of these locations indicating the potential for uncombusted hydrocarbons.

After finishing the walkthrough of the by-products plant, EPA inspectors walked around to the coke side of the old block. The baghouse which controls emissions from the old block batteries is located in this area. The baghouse has 14 modules and uses teflon bags. MSC monitors pressure drop across the baghouse daily and records it in their daily turn sheet. This completed the morning walkthrough and the inspection team paused for lunch at 11:00AM. This completed the LDAR portion of the physical inspection.

IV. Records Review

Prior to the inspection, EPA requested several records be made available for review at the inspection. The records requested prior to the inspection are included in Attachment 1 to this report. At the inspection, MSC provided a USB drive with the following records:

- Plot plan of MSC;
- Process Flow Diagram;
- Monthly/Quarterly/Annual LDAR Reports 2016-2021;
- Copy of LDAR Component Database;
- Battery 1, 2, 3, 8 Method 303 Monitoring Summary Nov. 2020-Jun 2021;
- Battery 1, 2, 3, 8 Method 303 Leak Summary Nov.2020-Jun 2021;
- Oven out of service Dates Nov 2020-Jun 2021;
- Crossover Backpressure Charts Battery 1, 2, 3, 8 for 6/8/21-6/14/21

The records were not reviewed during the inspection with MSC. During the inspection, EPA requested, and MSC provided, the pushing schedule for 6/14-6/15 2021. EPA also requested a copy of the LDAR monitoring history for each component in Excel and MS Access. MSC indicated that they would consult with their contractor to provide this information. On June 18,

2021, via email, Patrick Smith provided the Method 9 pushing records for Batteries 1, 2, & 8 from Nov 2020-Jun 2021.

V. Closing Conference

Once the entire inspection team returned to the conference room, a closing conference was held to summarize the inspection and discuss next steps. The EPA inspectors noted that the investigation is on-going, and any areas of concern identified in the final reports do not necessarily reflect a violation or deviation, rather, they are areas that will require further investigation. EPA also noted that they would issue an inspection report within in 60 days, with a copy to the State. Simultaneously, EPA will perform a detailed review of records and may have additional questions. At the conference, MSC and EPA discussed that half of Battery 2 has also been in hot idle since 2012 and that part of Battery 1 as taken out of service on 6/2/21 to replace structural steel on the crossover. The LDAR inspection team noted that they would have to review all LDAR data to determine if there are any additional questions and would need the additional monitoring data for review. The battery inspection team also noted that they would review pushing, Method 303, Method 9 reports, and inspection notes.

The GMAP inspection team provided a brief summary of their findings but indicated that the results are preliminary depending on the data undergoing a review once they return to the office. The GMAP conducted multiple traverses of the facility inside of the fenceline. Elevated levels of H₂S and benzene were detected between the old block and the tar decanters on the first day of the inspection. Also, elevated levels of benzene were detected downwind of both the old and new block. The GMAP team collected three physical samples over the course of the inspection during higher benzene events. Once the data is QA'd, a graphic trip report with concentrations will be overlayed with a map of the Facility and will be included in the report. This concluded the inspection and EPA exited the Facility.

The following have been identified as *potential* issues during the inspection. They are issues that require either further investigation by EPA or additional information or explanation by MSC.

- While conducting GMAP monitoring on June 15-16, 2021, EPA detected elevated emissions of H₂S and benzene at several locations within the fenceline. The GMAP report indicates the locations and concentrations of the pollutants. MSC should evaluate the sources of benzene and H₂S and their calculated annual emissions.
- During the onsite inspection, EPA obtained three summa canister samples at three different locations. The attached sampling report (Attachment 5) provides the sampling results. These results indicate elevated levels of several pollutants, including benzene, acrolein, and toluene. MSC should evaluate the sources of these pollutants and the values reported in their annual emission statement. Additional measures may be necessary to limit these emissions wither through control techniques or permitting.
- Multiple doors were observed leaking during both days of the inspection on Batteries 1, 2, and 8.

VI. List of Attachments

- Attachment 1: 6/11/21 email to Patrick Smith (MSC) detailing inspection logistics and requesting records to review during inspection.
- Attachment 2: LDAR Photo Log
- Attachment 3: Battery Opacity Photo Log
- Attachment 4: Video Log
- Attachment 5: Summa Canister Sampling Report