



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

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Fairborn Cement Company, Xenia, Ohio

FROM: Valeria Apolinario, Environmental Engineer
AECAB (MN-OH)

Charles Hall, Environmental Engineer
AECAB (MN-OH)

THRU: Brian Dickens, Section Chief
AECAB (MN-OH)

TO: File, Fairborn Cement Company, Xenia, Ohio

BASIC INFORMATION

Facility Name: Fairborn Cement Company (FCC)

Facility Location: 3250 Linebaugh Road, Xenia, Ohio

Dates of Inspection: August 23 and 24, 2022

EPA Inspectors:

1. Valeria Apolinario
2. Charlie Hall

Other Attendees:

1. Tom Byrne, Environmental Manager
2. Jeremy Cooper, CEM Technician
3. Tom Fife III, Maintenance Supervisor – Dust Collectors
4. John Miller, V.P. of Operations
5. Brett Silcott, Kiln Control Room Operator
6. Alex Winner, Process Engineer

Contact Email Address: tbyrne@fairborncement.com

Purpose of Inspection: To determine compliance with the National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry (the PC MACT) and Title V Permit.

Facility Type: Portland and masonry cement plant

Regulations Central to Inspection: Portland Cement MACT and Title V Permit

Date:	August 23, 2022	August 24, 2022
Arrival Time:	0845 hrs EDT	0825 hrs EDT
Departure Time:	1600 hrs EDT	1145 hrs EDT

Inspection Type:

- ☒ Unannounced Inspection
- ☐ Announced Inspection

OPENING CONFERENCE

- ☒ Presented Credentials
- ☒ Stated authority and purpose of inspection
- ☐ Provided Small Business Resource Information Sheet
- ☒ Small Business Resource Information Sheet not provided because assets are greater than \$25.0 million.
- ☒ Provided CBI warning to facility

The following information was obtained verbally from Tom Byrne unless otherwise noted. Miller joined the inspection for the opening conference on the first day and briefly on the second day. Cooper joined the inspection to show the continuous emission monitoring equipment to the inspectors. Fife and Winner accompanied the inspectors on the plant tour. Fife also participated in the records review on the second day. Silcott supplied the PC MACT continuous monitoring system data.

Company Ownership: The ownership has not changed in the last 5 years.

Process Description:

FCC mines limestone and clay from an on-site quarry and crushes them in separate equipment into softball-sized or smaller pieces. The limestone is stored in a large open-air shed. FCC adds the clay to limestone which are then fed together to the raw mill where the clay and limestone are ground together to the fineness of talcum powder. The resulting mixture is pneumatically conveyed to the top of the four-stage pre-heater tower. As the limestone, which is primarily calcium carbonate, and clay flow down the pre-heater tower, carbon dioxide disassociates from the calcium carbonate. The pre-heated mixture is fed to the cold end of the rotary kiln. FCC burns coal in burners in the hot end of the kiln. FCC's primary fuel is pulverized coal but also uses natural gas and pet coke as fuel. FCC has used fuel oil in the past. Cement clinker exits the kiln to the clinker cooler and is then stored in the clinker dome. FCC grinds the cement clinker in the finish mill. The final product is stored in silos and loaded into trucks.

FCC has numerous fabric filters to control particulate matter emissions. Among other locations, FCC has fabric filters to control emissions from the limestone crushing equipment, the limestone storage conveyor, the kiln feed building, the clinker cooler, the clinker storage, the coal storage building, the finishing mill, and the loading terminal. FCC utilizes activated carbon injection to control for mercury emissions, lime spray injection to control for SO₂ emissions, and ammonia reagent injection to control for NO_x emissions from the main stack. Lime spray is also injected in the alkali bypass stack.

The PC MACT and/or the Title V permit require(s) FCC to monitor the following parameters continuously: raw material feed rate, total hydrocarbon emissions, kiln baghouse site-specific particulate matter continuous parameter monitoring system (PM CPMS) parameter, clinker cooler baghouse site-specific PM CPMS parameter, sulfur dioxide (SO₂) concentration, oxides of nitrogen (NO_x) concentration, kiln exhaust gas temperature, ammonia reagent injection rate, and alkali bypass exhaust gas temperature. The PC MACT and Title V permit require FCC to demonstrate compliance by operating a mercury CEMS or a sorbent trap based CEMS. FCC uses the mercury sorbent trap CEMS to demonstrate compliance. However, FCC also installed, operates, calibrates, and maintains a mercury CEMS to provide continuous monitoring.

Staff Interview:

Miller and Byrne provided a set of diagrams that illustrate the major steps of the process. The diagrams are attached. Miller and Byrne stated that FCC analyzes process feedstocks for magnesium, sulfur, and total hydrogen carbons to keep their concentrations low. High magnesium concentrations in the feedstocks will adversely affect product quality. Mercury is not an issue from limestone and clay. Coal is the source of mercury, and the mercury concentration is a specification in the purchase contract. They also stated that hydrogen chloride and SO₂ will cause clogs in the pre-heater tower. During the plant tour, in response to a question from Hall, Byrne answered that a ring of cement clinker will form within the kiln once or twice per year.

The limestone crushers are inside a building. A horizontal conveyor under the crusher transports the crushed limestone to an inclined conveyor. Fabric filter B10 collects PM from inside the crusher building. Fabric filter B49 collects PM that emits from the inclined conveyor. During the plant tour, the inspectors observed a cloud of PM outside of the crusher building. See pictures 3, 4, and 5 below. Byrne noted that FCC believes B49 is undersized for the crushed and has scheduled its replacement with a fabric filter that will double the volumetric flow rate to 10,000 cubic feet per minute.

The inspectors observed fugitive dust at the Transfer Tower Hopper (picture 7). Byrne explained that FCC was conducting maintenance to clean the conveyor belt at transfer points. From the top of the pre-heater tower, the inspectors observed PM emitting from the Finish Mill (picture 14). During the second day of the inspection, FCC replaced two leaking bags in the Finish Mill's fabric filter. Byrne provided a copy of the work order. FCC has ordered the bags to replace all 500 bags in the Finish Mill's fabric filter. However, the project has been delayed until February 2023 due to supply chain problems. FCC has a few replacement bags as needed. On the second day of the inspection, Apolinario collected visible emission data for the Finish Mill. The VE data is attached.

The recently completed cement dome has an automated cement loading system. The current cement loading system has a manually operated cement loading system. Consequently, numerous drivers translate into a large variation in the attentiveness to procedures and resulting fugitive dust emissions.

As the inspectors were getting into the car to leave at the end of the first day of the inspection, they observed a plume of black dust above the kiln and followed it back to the carbon injection system where a crew of workers was performing maintenance work. See pictures 16 through 19.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations: The inspectors collected the following operating and emission data:

Parameter	Set Value, Units	Actual, Units
Raw Material Feed Rate	146.4 tons per hour, 1-minute average	145.8 tons per hour, 1-minute average
Total Hydrocarbon	28.5 ppmV, 30-day rolling average	24.6 ppmV, 30-day rolling average
THC 1-day rolling average	No emission standard	25.2 ppmV
THC 1-minute average	No emission standard	1.1 ppmV
Kiln Baghouse Site-Specific PM CPMS Parameter	6.0 mA, 30-day rolling average	0.9 mA, 30-day rolling average
Clinker Cooler Baghouse Site-Specific PM CPMS Parameter	6.4 mA, 30-day rolling average	0.1 mA, 30-day rolling average
SO ₂	1.1 pound per ton of cement clinker, 30-day rolling average	0.930 pounds pr ton, 30-day rolling average
NO _x	1.85 pounds per ton of cement clinker, 30-day rolling average	1.76 pounds per ton of cement clinker, 30-day rolling average
Ammonia Injection Rate	Not available ³	5.9 gallons per minute
Dioxin/Furan Parameters		
Kiln Exhaust Gas Temperature	348°F raw mill on	Not available ¹
	547°F raw mill off	
Alkali Bypass Exhaust Gas Temperature	496°F raw mill on or off	Not available ²
Mercury CEM ³	55 pounds per million tons of cement clinker	10.2 pounds per million tons of cement clinker
Hydrogen Chloride ⁴	95.0 ppm wet, 30-day rolling average	19.7 ppm wet, 30-day rolling average

Photos were taken during the inspection.

Field Measurements: were taken during the inspection. Visible emission data sheet attached.

RECORDS REVIEW

During the inspection, the inspectors reviewed example Reference Method 22 data.

Requested documents:

The inspectors requested the following documents during the inspection:

¹ The inspectors reached the control room at approximately 1400 hrs. This temperature would not be available until 1630 hours. The data will populate the operator's screen when available.

³ The Title V Permit does not require a set value to be established for the ammonia injection rate.

² This average resets when the raw mill status changes.

³ FCC uses mercury traps to determine compliance. It uses the mercury CEM to track the trend of its mercury emissions.

⁴ As the PC MACT allows, FCC measures SO₂ as surrogate for HCl. The regulatory limit is re-set every 30 months.

- Facility Map Overview
- Facility Processes Overview (12 overall pages)
- Examples of Daily Finish Mill Method 22 Reading (8/5/2022, 8/19/2022, and 8/23/2022)
- Monthly Method 22 Example from April 1, 2022, on Cement Elevator to Finish Mill Baghouse
- Communications with RAPCA about utilizing additional PM injections during PM performance test including
 - o Letter from Andrew Weisman approving additional PM injections on a conditional basis
 - o Kiln and Cooler Test Report Follow-Up emails between Chelsea Villalba (Fairborn Plant Environmental Manager) and Jennifer Riley (RAPCA)
 - o Memo from Chelsea Villalba to the facility that RAPCA authorized removal of opacity monitors from service
- Notice of Intent to perform PM and D/F Tests dated September 3, 2014
- Sampling Protocol for D/F testing to occur May 1-5, 2017
- Title V Emissions Report for 2021
- D/F Report for Test Dates July 25-26, 2019
- D/F Report for Test Dates January 25-27, 2022
- Sampling Protocol for D/F Testing to occur January 25-26, 2022
- Q1, Q2 Title V Deviation Reports 2022
- Q3, Q4 Title V Deviation Reports 2021,
- Dust Collector Inspection Checklist
- Daily Visible Emissions (Y/N) documentation from 8/24/2021-8/23/2022
- Annual Greenhouse Gas Report for 2021

Concerns: The inspectors identified four concerns:

1. Dioxin/Furan Monitoring

Because FCC is subject to a dioxin/furan emission standard and because FCC uses activated carbon injection, FCC must demonstrate compliance with the activated carbon injection rate operating limits specified in §63.1346 by using the performance test methods and procedures in §63.1349(b)(3)(v). See 40 C.F.R. § 63.1348(a)(3)(iii). Consequently, the PC MACT requires FCC to maintain a 3-hour rolling average carbon injection feed rate and either a carrier fluid flow rate or pressure drop and to install, operate, calibrate, and maintain a continuous monitor to record the activated carbon injection system carrier gas parameter (either the carrier gas flow rate or the carrier gas pressure drop). See 40 C.F.R. § 63.1350(h), (h)(1), (h)(2), (m)(4) and (m)(9). There was no indication that these obligations were being met.

2. Plastic Strip Curtains at Doors

The Title V permit requires FCC to have plastic strip curtains at the tunnel entrance/exit of the limestone crusher which is emission unit P901. The inspectors found them missing.

3. Black Dust Plume

On August 23, 2022, as the inspectors were about to get into the car, Mr. Hall noticed a black dust plume behind the kiln. He followed the plume back to the carbon injection equipment. The inspectors showed the picture to Mr. Byrne and Mr. Miller on August 24, 2022.

4. Opacity at Finishing Mill was 11.67% (3-minute average).

On August 24, 2022, Apolinario collected visible emission data for the Finishing Mill. The visible emission standard for that source is 10% as 3-minute average. FCC had replaced two bags that morning. The Environmental Manager stated he believes that the collector is still blowing out dust that was in the top plenum.

CLOSING CONFERENCE

- ☒ Provided U.S. EPA point of contact to the facility

DIGITAL SIGNATURES

CHARLES HALL Digitally signed by CHARLES
HALL
Date: 2022.09.28 09:13:38 -05'00'

Report Author:

Brian Dickens Digitally signed by Brian Dickens
Date: 2022.09.28 13:04:59
-05'00'

Section Chief:

Facility Name: Fairborn Cement Company
Facility Location: 3250 Linebaugh Road, Xenia, Ohio
Date of Inspection: August 23 and 24, 2022

APPENDICES AND ATTACHMENTS

- A. Digital Image Log
- B. Visible Emission Sheet

Facility Name: Fairborn Cement Company
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APPENDIX A: DIGITAL IMAGE LOG

1. Inspector Name: Valeria Apolinario	2. Archival Record Location: R5 Electronic Records Center
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Camera: Olympus TG-1

Equipment Number: SZ4061

Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
1	P8230005.jpg	2022:08:23 06:25:28	Fairborn Cement Entrance Sign
2	P8230006.jpg	2022:08:23 08:01:55	Clay Additive Building



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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
3	P8230007.jpg	2022:08:23 08:02:40	Visible Emissions from Limestone Crusher
			
4	P8230008.jpg	2022:08:23 08:05:59	Limestone Crusher Adjacent to Beginning of Lime Conveyor System
			

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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
5	P8230009.jpg	2022:08:23 08:08:26	Visible Emissions from B49 Dust Collector
			
6	P8230010.jpg	2022:08:23 08:10:56	Lime Conveyor Transfer Line
			

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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
7	P8230011.jpg	2022:08:23 08:13:25	Transfer Tower Hopper Maintenance Malfunction
			
8	P8230012.jpg	2022:08:23 08:14:47	Clay Transfer Point
			

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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
9	P8230013.jpg	2022:08:23 08:22:52	Limestone Tower with Additive Towers
			
10	P8230014.jpg	2022:08:23 08:23:45	Collection Point of Additives, Clay, and Lime to be Sent to Raw Mill
			

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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
11	P8230015.jpg	2022:08:23 08:29:29	Conveyor X-Ray Fluorescence Monitor
			
12	P8230016.jpg	2022:08:23 08:35:47	Plastic Strip Curtains at Limestone Crusher
			

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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
13	P8230017.jpg	2022:08:23 08:35:56	Plastic Strip Curtains at Limestone Crusher



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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
14	P8230018.jpg	2022:08:23 09:21:52	Visible Emissions at Finish Mill
			
15	P8230019.jpg	2022:08:23 11:51:46	Inside of Clinker Storage
			

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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
16	P8230020.jpg	2022:08:23 13:37:11	Back of Finish Mill
			
17	P8230021.jpg	2022:08:23 13:37:36	Activated Carbon Plume
			

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Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
18	P8230022.jpg	2022:08:23 13:38:09	Activated Carbon Injection Maintenance
			
19	P8230023.jpg	2022:08:23 13:38:14	Activated Carbon Maintenance, Plant View
			

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APPENDIX B: VISIBLE EMISSION DATA

VISIBLE EMISSION OBSERVATION FORM

No.

COMPANY NAME US EPA		
STREET ADDRESS 77 W Jackson Blvd		
CITY Chicago	STATE IL	ZIP 60604
PHONE (KEY CONTACT) 666-661-2027	SOURCE ID NUMBER 082970065	

PROCESS EQUIPMENT Finishing Mill	OPERATING MODE On
CONTROL EQUIPMENT Baghouse	OPERATING MODE on

DESCRIBE EMISSION POINT Finishing Mill, slightly above stack.	
HEIGHT ABOVE GROUND LEVEL 100ft 125ft	HEIGHT RELATIVE TO OBSERVER Start 120 End 120
DISTANCE FROM OBSERVER Start 500ft End 500ft	DIRECTION FROM OBSERVER Start NIN End NW

DESCRIBE EMISSIONS Start white, semi-transparent End white, semi-transparent	
EMISSION COLOR Start white End white	IF WATER DROPLET PLUME Attached ☐ N/A Detached ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED Start above vent End above vent	

DESCRIBE PLUME BACKGROUND Start cloudless sun End cloudless sun	
BACKGROUND COLOR Start blue End blue	SKY CONDITIONS Start cloudless End cloudless
WIND SPEED Start 0 End 0	WIND DIRECTION Start 0 NW End 0 NW
AMBIENT TEMP Start 74° End 74°	WET BULB TEMP 79°F
	RH, percent 63%

Stack with Plume Sun Wind	SOURCE LAYOUT SKETCH
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ADDITIONAL INFORMATION stack closer to roof, measured slightly above

OBSERVATION DATE		START TIME		END TIME	COMMENTS	
SEC	MIN	0	15	30		45
8/24/22	10:54 AM	10:57 AM				
1	10	5	5	10		11.5% average
2	10	20	15	10		11.5% average
3	5	20	10	20		11.67% 3-min average
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OBSERVER'S NAME (PRINT) Valeria Apolinario	
OBSERVER'S SIGNATURE 	DATE 8/24/22
ORGANIZATION USEPA	
CERTIFIED BY Aeromet	DATE 8/16/22
CONTINUED ON VEO FORM NUMBER	