REGION 3
PHILADELPHIA, PA 19103

Report Title:	Clean Air Act Inspection of Heidelberg Materials US Cement		
Inspection Date(s):	December 12, 2023		
Regulatory Program(s):	Title V, SIP, NESHAP, MACT, NSPS		
Company Name:	Heidelberg Materials US Cement LLC		
Facility Name:	Heidelberg Materials US Cement		
Facility Location:	3938 Easton Nazareth Highway Nazareth, PA 18064		
Latitude:	40.72966	**Longitude:**	-75.30078
County/Parish:	Northampton County		
AFS/ICIS-Air Number:	PA000262830		
Permit Number:	48-00004		
NAICS Code:	327310	**SIC:**	3241
DSB ID #:	ECAD-124		

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I. Introduction

The United States Environmental Protection Agency (EPA) conducted a Clean Air Act (CAA) inspection at Heidelberg Materials US Cement (Heidelberg Materials, Plant One or Facility) to verify compliance with applicable State and Federal regulations. The Pennsylvania Department of Environmental Protection was notified of the inspection on November 27, 2023 via email. On December 8, 2023, EPA notified the Facility of the planned inspection via phone and email. EPA emailed a list of records for review to Luis Rodriguez, prior to the inspection (see Attachment 1). These records are listed in the Records Review section of the report.

The inspection included an evaluation of the Facility's processes and its compliance with the CAA. All information included in this report is the result of statements by the Facility representatives, materials shown to the inspectors by the Facility representatives, and/or documents provided by the Facility representatives to the inspectors at the time of, or subsequent to, the inspection. In addition, information gathered prior to the inspection from a review of EPA and State records may be included in Section A. Summary of the Facility.

A. Summary of the Facility

The Facility is located at 3938 Easton Nazareth Highway, Nazareth, PA 18064. Heidelberg Materials US Cement is one of a series of plants located in Nazareth, PA that processes limestone from local quarries into cement products. No quarrying activities happen at this facility, raw material is brought from a nearby quarry via a two-mile long belt.

The Facility received a Title V Permit (48-00004) from PA DEP issued on February 17, 2023.

Heidelberg Materials US Cement is classified as a Major source for Particulate Matter (PM), Nitrogen oxides (NOx), Volatile Organic Compounds (VOCs), Sulfur oxides (SOx), Carbon monoxide (CO), and Hazardous Air Pollutants (HAPs). The Facility is subject to, or potentially subject to the following federal regulations:

- 40 CFR Part 60 Subpart F – Standards of Performance for Portland Cement Plants
- 40 CFR Part 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
- 40 CFR Part 63 Subpart LLL – National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry
- 40 CFR Part 63 Subpart ZZZZ – National Emission Standards for Hazardous Pollutants for Stationary Reciprocating Internal Combustion Engines

B. Inspection Opening Conference

At 9:10 AM on December 12, 2023, EPA inspectors arrived at the Facility for a CAA Inspection and conducted a brief opening conference. Heidelberg Materials US Cement was represented by Luis Rodriguez, Environmental Professional. Also, Sydnee White and Leanne Hillegas of PA DEP were present. EPA inspectors, Scott Yanos and Bruce Augustine, presented their credentials and explained the purpose of the visit was to conduct a CAA inspection to determine compliance with their permit and any applicable regulations. Additionally, EPA informed the facility representatives of their right to claim any confidential business information (CBI). At that time, Luis Rodriguez did not claim any photos or documentation as CBI.

II. Site Activity/Process Description

Heidelberg Materials US Cement is a system of limestone quarries and cement plants located in Nazareth, PA. The facility that was inspected is designated as Plant I by Heidelberg Materials with Plants II and III located nearby. The original plant, which is Plant III, was built in the 1940s. Part of Plant II was built in 1911 and then finished over the years of operation. Plant one was built in the 1950s with the large processing tower being built later in the 1970s. Heidelberg Materials US acquired Plants One, Two and Three from Essroc Italcementi in 2016 and treat operate all three plants like they are one complex, but each plant is permitted separately by the Air Quality Program of Pennsylvania. In the whole complex, there are 180 employees with 24/7 operations. Main production is two 12 hour shifts. There is scheduled plant downtime around the February-March and September-October where they perform maintenance.

Plant One does not have any active quarry operations and only processes the raw limestone it receives from Plant Three from a two-mile conveyor belt or trucks if the belt is down. Limestone crushers are located at Plant Three that crush the limestone as it is mined from the quarry, the crushed limestone is then loaded onto the belt to go to Plant One for processing into cement. The belt leads to the A-frame at Plant I, where it is dropped and stored until it is ready to be processed into cement.

From the A-frame, limestone is conveyed to hoppers that collect the crushed limestone and take it the raw mill. Additional raw materials such as sand, iron ore and/or mill scale are added before preceding up to the blend silos to be mixed. The raw material blend is transferred to the holding or day bins at the top of the precalciner/preheater tower via elevators. Raw material is added at the top of the tower and proceeds through the stages of the preheater tower toward the kiln. Hot air generated from combustion in the kiln is conveyed in the opposite direction up the preheater tower to dry the raw material and facilitate the reaction. Lehigh utilizes two baghouses to control PM emissions from the preheater tower and the preheater bypass. Lehigh injects ammonia in a section of the preheater tower to control NOx emissions generated in the process. Finally, Lehigh utilizes lime for SO2 emission control in the raw mill.

After being preheated through the tower, the raw material mixture heads to the kiln which turns the mixture into either Type One or Type Two clinker, depending on the mixture chosen in the previous process. but the kiln used to combust coal as the primary fuel, but Heidelberg Materials switched to a natural gas burner in 2014 and have not burned coal since 2016. The main kiln burner is located at the far end of the kiln and there is a secondary burner which also fires natural gas located near the bottom of the preheater tower to add additional heat to the process. Once the kiln is fully fired up, the facility uses Alternative Engineered Fuel fed to the main burner in order to keep the kiln fire going. Luis Rodriguez mentioned that the Alternative Engineered Fuel has been increasingly difficult obtain. Portions of the kiln are re-bricked during the February-March and September-October shutdown periods because the kiln burns at such a high heat level that it damages and wears down the brick. The facility also recently replaced two parts of the shell to the kiln. The kiln at Plant I does not use mid-kiln firing or chains within the kiln for heat retention.

After exiting the kiln as clinker, the material drops down onto the clinker cooler bed where it is cooled for further processing. The clinker cooler uses a heat exchanger and fans to blow ambient air through the bed to cool the clinker. The clinker cooler is equipped with a baghouse to control PM emissions before going to the atmosphere. Belts then take the clinker, once it is cooled, to the finish mill where it is ground final product size. There is one finish mill with an inline roll press at Plant One which is fed from the silos to the mill via feed bins. Heidelberg Materials makes mostly Type One clinker at Plant I. The Type Two clinker produced at the plant is sent to Ohio. The long conveyor belt that brings in raw materials from Plant Three can be reversed to take clinker from the finishing silos to Plant Three where Heidelberg Materials has five finishing mills. At Plant One, material that is processed in the finishing mill is sent to storage silos that are used to fill trucks with the final product.

The facility still has a coal mill on premise in case they still wish to use coal for the kiln. The coal mill has a feed system that feeds the coal into the mill before taking it the kiln to be used for heating in the kiln. The coal mill has its own independent stack. There is no bypass stack.

The main stack for the facility exhausts gases from the kiln, preheater tower, and raw mill. The kiln stack is located after the two baghouses. The exhaust from splits in the preheater tower to the kiln bypass stack and the inline raw mail line. Heidelberg Materials uses a Continuous Emissions Monitoring System (CEMS) in order to monitor the emissions of total hydrocarbon (THC), mercury, NOx, SO2, CO2, moisture and has a flow meter. The facility uses SO2 as a surrogate in determining the limits for HCl emissions. There are opacity monitors on the kiln and clinker cooler stacks. There are PM monitors on the cooler and main stack that monitors condensable particulate matter (CPM) at those locations. Heidelberg Materials stack tests every 13 months using Method 5 to determine compliance with MACT LLL. The facility is testing for Hydrogen Flouride and Hydrogen Cyanide using the testing methods in the request detailed in the Portland Cement NESHAP Risk and Technology Review under Section 114.

For emissions controls, the facility uses the bag houses for metal HAPs controls, as well as for mercury and HCl. Lime is injected at the bottom of the conditioning tower in order to control SO2 emissions

with ten tons of lime in a silo for this purpose. The facility uses an ammonia injection system for NOx control with a 30,000 gallon above ground storage tank used to store the ammonia on premise.

Heidelberg Materials produces 1.8 million tons of cement per year with the average of 1.84 tons of raw materials being made into one ton of clinker. This does fluctuate depending on the quality of the raw materials. Samples are taken from the quarry to be analyzed by the lab to monitor sulfur and aluminum content due to how it affects emissions and other chemical processes which creates the raw limestone to be classified in high and low qualities.

The emergency generator on premise is a diesel generator that can only power the kiln motors along with other critical lighting and functions. The emergency generator can only power the kiln motors in order to for the kiln to spin down as it cools down to prevent warping and damage to the kiln.

There is a natural gas line that goes through the property owned by Terry Boiler, an energy company that uses the gas line to transport natural gas and is not maintained or operated by Heidelberg Materials. There is a dehumidifier located within a fenced in area that only Terry Boiler has access to. The dehumidifier is used to prevent moisture build up in the gas lines. Terry Boiler is the one who controls this operation.

The opening conference concluded at 10:42 AM.

III. Observations

EPA inspectors were led on a walkthrough of the Facility at 10:45 AM by Luis Rodriguez of Heidelberg Materials and Sydnee White and Leanne Hillegas of PA DEP also present for the walkthrough. EPA inspectors noted photos would be taken during the Facility walkthrough (Attachment 2).

The first place Luis Rodriguez took the EPA inspectors was the control room where all operations at Plant One are monitored. In the Control Room, the EPA inspectors observed that 473 metric tons of raw material was coming from the quarry at Plant Three via the long belt. Also, 290 metric tons per hour of raw materials was being fed into Raw Mill #1 and 250 metric tons per hour of material was being fed into the kiln. Finish Mill #1 was producing 93 metric tons of finished product. On the back end of the kiln, it was observed that 2,100 normal cubic meters per hour of gas was being fired and that 11,200 normal cubic meters per hour of gas was being fired at the front end of the kiln.

After the Control Room, Luis Rodriguez proceeded to show the EPA Inspectors the A-frame where the raw limestone is stored using hoppers to move the material from the quarry to the A-frame via the long belt. It was observed that a load pushes the raw limestone onto the belt to be brought into the Raw Mill where 1-3% of sand is added. The main stack of the facility along with the baghouse bypass was observed before proceeding to observe the belt that adds the raw materials to the Raw Mill which was actively grinding and blending the material during the inspection.

Next the 30,000-gallon ammonia tank and natural gas boiler was observed before heading up the main tower to observe the preheating of the materials before it goes into the kiln to start the chemical reaction process. As the EPA inspectors were led down the tower, the ammonia injectors were observed for NOx control along with the various piping and sensors used for the emissions monitoring and control. The EPA Inspectors also observed the burner near the feed end of the kiln.

After getting back down from the tower, Luis Rodriguez showed the EPA Inspectors the Emergency Generator which is located at the bottom of the tower. Luis Rodriguez said that the generator is not tested monthly. The Emergency Generator was observed to have a 1,000-gallon diesel day tank. The engine hours are logged in the Control Room and the hour meter was not able to be located at the time of the inspection.

From the Emergency Generator, the next area observed was the combustion end of the kiln where the clinker drops from the kiln into the cooler. Fans blow air up through the clinker to help cool the clinker before sending it to the finishing process. After observing the clinker cooler, the EPA Inspectors observed the old coal mill which appeared to be out of service. Luis Rodriguez then showed the EPA inspectors the conveyor that takes the clinker from the cooler to the finishing mill which breaks the clinker down into the powder cement using a tumbler filled with weighted metallic balls which is separated into two compartments with larger metallic balls to break down the clinker and the smaller ones to refine it down into a powder. After this the EPA inspection team followed the process where the product is taken to the loading silos where it can be loaded into trucks. Plant One only has a truck loader but Plant Two and Three have bagging operations.

The walkthrough concluded at 1:08 PM.

IV. Records Review

The records review commenced immediately after the plant walkthrough at 1:14 PM. EPA inspectors reviewed documents requested in the December 8, 2023, email to Luis Rodriguez (see Attachment 1). Records were provided at the time of the inspection by Luis Rodriguez. Below are the records requested and what was provided:

1. Provide a plot plan of the Facility. The plot plan should identify each kiln, clinker cooler, raw/finish mill, and other combustion source.
   Was not provided at the time of the inspection. Luis Rodriguez ensured it would be given to the EPA Inspectors the next day. The EPA Inspectors did receive the requested plot plan post inspection.

2. Provide a detailed process description of the facility. This should include a description of raw material processing, kiln operation and reaction, finished product processing and emission control.
   This was provided at the time of the inspection.
3. For each kiln, clinker cooler, raw mill, and finish mill located at the facility, provide the following information:
   a. Date of construction, date operation commenced at the facility.

b. Date the unit was modified or reconstructed;
c. Provide the current and historical (as built) capacity in tons/hour;
d. Fuels that can be combusted in each unit (e.g., coal, fuel oil, tires, etc.).
Was not sent ahead of the inspection but was provided during the inspection. Luis Rodriguez said that he would get us copies of everything we reviewed during the inspection.

4. For the time period January 1, 2019-December 12, 2023, provide the following information for each month (unless otherwise specified):
    a. Total production of clinker (tons);
    b. Total mass raw material feed to the kiln(s) (tons);
    c. Hours of operation of each kiln;
    d. Days kiln did not produce clinker;
    e. For each kiln, clinker cooler, raw/finish mill, provide the quantity of each fuel combusted;
    f. The average sulfur content in weight percent for each fuel (annually).
    This was provided at the time of the inspection.
5. Provide a copy of each stack/performance test that was conducted at the facility since January 1, 2019. This includes any test that was conducted to determine compliance with any permit limit or other applicable regulation, any test conducted to determine control efficiency, or any test conducted internally for informational purposes.
This was provided at the time of the inspection.

6. Provide a list of each continuous emission monitoring system (CEMS), continuous emission rate monitoring system (CERMS), and continuous opacity monitoring system (COMS) at the facility that is used to measure/monitor emissions from a source. Identify which stack or emission point the CEMS, CERMS, or COMS is located and which pollutants are being measured or monitored. Also, provide the date of the last CEMS RATA test.
This was provided at the time of the inspection.

7. Provide copies of each enforcement action that has been issued by either EPA or the PADEP under any statute since January 1, 2019.
This was provided at the time of the inspection.

8. Provide the date the most recent Title V permit application was submitted to PADEP. Also, identify if the Title V permit (48-00004) issued by PADEP on April 17, 2019 is the most recent permit issued.
This was provided at the time of the inspection.

9. Provide copies of the initial notification and periodic (quarterly, semiannual, annual) reports for each applicable regulation under 40 C.F.R. Parts 60 and 63, including but not limited to, 40 C.F.R. Part 60 Subpart F and 40 C.F.R. Part 63 Subpart LLL. The periodic reports should be submitted for the period January 1, 2020-December 31, 2023.
This was provided at the time of the inspection.

10. Provide the 30 day rolling average emissions for NOx, SO_2, Hg, THC and the method used to calculate the average.
This was provided at the time of the inspection.

11. Provide CEMS data (averaged hourly in lbs) for NOx, SO2, Hg, THC any other pollutant being monitored from January 1, 2023 to the date of the inspection. This data should be provided in an Excel spreadsheet.
    This was provided at the time of the inspection.

12. Provide copies of COMS monitoring records for kiln and clinker cooler. Provide the emission averages and COMS data from January 1, 2020 through the present.
    This was provided at the time of the inspection.

V. Closing Conference

After the records review, EPA inspectors, and Luis Rodriguez had a brief closing conference to ask additional questions and discuss observations. The EPA inspectors noted that the investigation is on-going, and any areas of concern identified in the final report 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. The inspection concluded at 3:00 PM.

VI. List of Attachments

Attachment 1:	Email correspondence to Luis Rodriguez of records requested to review during inspection
Attachment 2:	Photo Log