

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

B147763164

FACILITY: Holcim (US) Inc. DBA Lafarge Alpena Plant		SRN / ID: B1477
LOCATION: 1435 Ford Avenue, ALPENA		DISTRICT: Cadillac
CITY: ALPENA		COUNTY: ALPENA
CONTACT: Mallory Miller ,		ACTIVITY DATE: 05/19/2022
STAFF: Kurt Childs	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: 2022 FCE, PCE 2: FG FUEL HAND, FG KG5, FG KG 6, FG CLINK COOL.		
RESOLVED COMPLAINTS:		

2022 FCE Partial Compliance Evaluation (PCE) No.2: Site inspection and records review of FG FUEL HAND, FG KG5, FG KG6, FG MACT KILN and FG CLINK COOL,

MI-ROP-B1477-2021b

Introduction

This activity report covers the second PCE for the 2022 Full Compliance Evaluation of the Holcim (US) d/b/a Lafarge Alpena (Lafarge) Cement Plant. Emission groups covered by this PCE are; FG FUEL HAND – fuel storage (piles) transportation, processing and firing; FG KG5 – Kilns 19,20,21 and associated air pollution control devices; FG KG6 – Kilns 22 and 23 and associated air pollution control devices; FG MACT KILNS - PC MACT requirements for the kilns and associated equipment. FG CLINK COOL – Clinker coolers for each kiln and the associated air pollution control devices.

On May 19, 2022, AQD staff Kurt Childs and David Bowman met with Mallory Miller of Lafarge Alpena to conduct the PCE of the source. Prior the inspection AQD staff made observations from off-site. The weather was clear, around 60 degrees with light winds. We observed the Kiln stacks and many of the dust collector stacks and vents throughout each area of the plant as well as building openings. Each of the five kilns was operating with the exception of Kiln 20 which was not. There was an attached water vapor plume from the KG6 wet FGD stack that was rising but no visible emissions were noted from any of the kiln stacks. We also observed other areas of the plant such as the raw mill, finish mill, fuel mills and clinker coolers. Some fugitive emissions were observed related to fuel hauling traffic. A water truck was in operation throughout the inspection treating the plant roadways.

Specific records for each Flexible Group were requested following the inspection. Required reporting has been reviewed as it was received throughout the year. The pertinent recordkeeping and reporting information is addressed in the relevant sections of this report

FG FUEL HAND:

The fuel handling system receives, stores, transports, and pulverizes the fuel used to fire the kilns. Fuels are delivered and stockpiled outdoors from where the fuel is transported by heavy equipment to the indirect firing system which includes the fuel pulverizers. Dust suppression is used on the fuel piles and the fuel pulverizers are equipped with dust collectors. We observed fuel handling activities in operation including building of the fuel pile (loaders, conveying, drop points) and loading, hauling, unloading of fuel from the pile to the kilns. No visible emissions were observed except for fugitive emissions from the haul truck on the fuel pile.

Emission Limits:

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing
1. Visible Emissions (VE)	20% opacity	Six-minute average	FG FUEL HAND	No opacity from any of the stacks/vents.	NA
2. PM-10	1.8 pounds per hour ²	Test Protocol ^a	EU FUEL PULV 19, EU FUEL PULV 20, EU FUEL PULV 21	NA	See testing section.
3. PM-10	8.0 tons per year ²	12-month rolling time period as determined at the end of each calendar month	EU FUEL PULV 19, EU FUEL PULV 20, EU FUEL PULV 21	NA	2.8 tpy or less each. (see attached records)
4. PM-10	2.9 pounds per hour ²	Test Protocol ^a	EU FUEL PULV 22, EU FUEL PULV 23	NA	See testing section.
5. PM-10	12.8 tons per year ²	12-month rolling time period as determined at the end of each calendar month	EU FUEL PULV 22, EU FUEL PULV 23	NA	2.7 tpy or less each. (see attached records)
6. PM	0.15 pound per 1000 pounds of exhaust gases, calculated on a dry basis ²	Test Protocol ^a	EU FUEL PULV 19, EU FUEL PULV 20, EU FUEL PULV 21, EU FUEL PULV 22, EU FUEL PULV 23	NA	See testing section.

II. Material Use Limits

NA

III. Process/Operational Limits

1. At the time of the inspection the dust collectors appeared to be operating properly. No visible emissions were observed from the FG FUEL HAND control equipment for the four kilns that were operating. The differential pressure readings for each of the operating fuel pulverizer dust collectors were 1". W.G. each.

IV. Design Parameters

1. Minimize emissions from fuel pile, coal blending. Water is used as a dust suppressant as needed. The fuel pile sprinkler system is in place no visible emissions were observed.

V. Testing/Sampling

Once every five years, verification of PM10 emission rates. 2017* test results:

EU	PM10 Limit (lbs./hr.)	2017 test result	PM Limit (lbs./1000lb dry)	2017 test result
EU FUEL PULV 19	1.8	0.8	0.15	0.01
EU FUEL PULV 20	1.8	0.3	0.15	0.01
EU FUEL PULV 21	1.8	0.8	0.15	0.03
EU FUEL PULV 22	2.9	0.8	0.15	0.01
EU FUEL PULV 23	2.9	0.4	0.15	0.00

5 yr. PM10 testing was conducted on 5/12/2022. Test results are pending.

VI. Monitoring/Recordkeeping

Monthly and 12-month rolling time period PM10 emission calculation records using the most recent stack test results demonstrate PM10 emissions are below the 12.8 ton per year limit in Section I (see attached records).

Monitor and record the pressure drop across each dust collector associated with FG FUEL HAND SYS, on a daily basis. Records are maintained by the DAHS and are available. The attached DP trend for each of the fuel pulverizer baghouses indicates the DP averaged between 1.2 and 2.0 inches H2O, except for periods coinciding with Kiln downtime for maintenance. DPs for the kiln 22 and 23 pulverizers were toward the higher end.

VII. Reporting

NA

VIII. Stack/Vent Restrictions

Stack & Vent ID	Maximum Exhaust Dimensions Diameter (inches)	Minimum Height Above Ground (feet)
1. SV613-01 (36-K19) EU FUEL PULV 19	30²	60²
2. SV623-01 (36-K20) EU FUEL PULV 20	30²	60²
3. SV633-01 (36-K21) EU FUEL PULV 21	30²	60²
4. SV6A3-01 (36-K22) EU FUEL PULV 22	40²	60²
5. SV6B3-01 (36-K23) EU FUEL PULV 23	40²	60²

During this inspection, the fuel pulverizer stacks were not evaluated for compliance with the diameter and height requirements but they appear to comply with the specified permit parameters and there have not been any changes to their configuration since they were permitted.

IX. Other

NA

FG KG5

Kilns 19, 20 and 21 each controlled by a main baghouse, SNCR, and DAA. Kiln 20 was not operating at the time of the inspection. No visible emissions were evident from any of the main stacks. We observed each of the kilns and baghouses as well as the SNCR system and DAA system.

The kilns are subject to the PC MACT and CEMS have been installed for NO_x, CO, SO₂, HCL, PM, Mercury, O₂, CO₂ and Flowrate.

I. Emission Limits

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing

VE	20% opacity²	Six-minute average	FG KG5 (The limit applies to each individual kiln.)	19. 0% 20. Not operating 21. 0%	NA
PM	0.25 pound per 1,000 pounds of exhaust gas calculated on a dry gas basis²	Test Protocol^a	FG KG5 (The limit applies to each individual kiln.)	NA	See test section.
SO₂	4.07 pounds per ton clinker²	30-day rolling average, as determined at the end of each kiln operating day	EU KILN 19	4.46 lb./ton clinker	2021 Quarterly EERs; no excess emissions
NOx	4.72 pounds per ton clinker²	30-day rolling average, as determined at the end of each operating day	EU KILN 19	4.36 lb./ton clinker	2021 Quarterly EERs; no excess emissions
CO	284 tons per year²	12-month rolling time period as determined at the end of each calendar month.	EU KILN 19	Not observed.	2021 Quarterly EERs; no excess emissions
SO₂	4.09 pounds per ton clinker²	30-day rolling average, as determined at the end of each operating day	EU KILN 20	Not operating.	2021 Quarterly EERs; no excess emissions
NOx	4.91 pounds per ton clinker²	30-day rolling average, as determined at the end of each operating day	EU KILN 20	Not operating	2021 Quarterly EERs; no excess emissions
CO	280 tons per year²	12-month rolling time period as determined at the end of each calendar month.	EU KILN 20	Not operating	2021 Quarterly EERs; no excess emissions
SO₂	3.93 pounds per ton clinker²	30-day rolling average, as determined at the end of each operating day	EU KILN 21	0.67 lb./ton clinker	2021 Quarterly EERs; no excess emissions
NOx	4.48 pounds per ton clinker²	30-day rolling average, as determined at the end of each operating day	EU KILN 21	3.67 lb./ton clinker	2021 Quarterly EERs; no excess emissions

CO	279 tons per year ²	12-month rolling time period as determined at the end of each calendar month.	EU KILN 21	Not observed.	2021 Quarterly EERs; no excess emissions
----	--------------------------------	---	------------	---------------	--

II. Material Use Limits

Material	Limit	Time Period/ Operating Scenario	Records
1. Plastics	65,375 tons per year ^{2, a}	12-month rolling time period	None
2. Clean wood	39,432 tons per year ^{2, b}	12-month rolling time period	None
3. Shingles	26,240.5 tons per year ^{2, c}	12-month rolling time period	Approximately 275 tons 2021 all kilns

4. – 6. Plastic, wood, shingle fuel use: No plastics or wood, minimal amount of plastics as indicated above.

7. Plastic fuel quality requirements, non-chlorinated, non-halogenated (<2.0%). Resin codes 1,2,4,5,6,7 only. No plastic fuels used.

8. Wood fuel quality. Clean leaf, bark, grass wood. No wood fuels used.

9. Shingle fuel quality. Shredded/chipped asphalt roof shingle only.

The use of alternative fuels, plastics, clean wood, and shingles is limited to 65,375 TPY, 39,432 TPY, and 26,240.5 TPY of each, respectively. Company records (attached) indicate approximately 275 tons of shingles were used in 2021. No alternate fuels were delivered, or being used as fuel at the time of the inspection. A small amount of shingle fuel remained in storage on-site according to Lafarge Alpena staff.

III. Process/Operational Limits

1. SNCR, DAA, baghouses and dust collectors are installed, maintained, and operated in a satisfactory manner.

Control	Kiln 19	Kiln 20	Kiln 21
SNCR feed rate (gpm)	0.5	Not Operating	Not observed
DAA feed rate (pph)	217 lb/hr (both Kilns)	Not Operating	

Baghouse DP 0.01 kPa to 2.49 kPa	0.6 KPa	Not Operating	Not observed
----------------------------------	---------	---------------	--------------

All pollution control equipment appeared to be installed and operating properly. Each kiln is equipped with NO_x, CO, SO₂, HCL, PM, Mercury, O₂, CO₂ and Flowrate CEMS which are calibrated, maintained, and operated in accordance with the applicable performance specifications. Air emissions are controlled by a large baghouse on each kiln for particulate control as well as Selective Non-Catalytic Reduction (SNCR) and Dry Absorbent Addition (DAA) systems for the control of NO_x and SO₂, respectively. The baghouses consist of 12 sections, bags are replaced in 2 of the sections each shutdown on a rotating basis. Baghouse differential pressure is continuously monitored. The SNCR system uses the same infrastructure as FG KG6 and ammonia flow rate to the kiln is continuously monitored. The DAA system now uses trona as the absorbent and the amount of trona used per hour is monitored.

4. Alternate fuels procurement plan.

Certificate of analysis, each delivery. No deliveries in 2021.

Monthly sampling and analysis of each supplier's deliveries. NA, 2021. Lafarge Alpena notified the AQD of the intent to resume shingle fuel use as NHSM. A small amount of remaining shingle fuels (<1% of fuels) were used in the three kilns in 2021.

IV. Design Parameters

1. Baghouse DP reading continuously monitored in Control Room: see table in Section III.
2. SNCR, DAA operating parameters continuously monitored in Control Room: see table in Section III.
3. SNCR NH₃STGTANK equipped with vacuum breaker and relief valve set at 25 psi \pm 5 psi. Lafarge Alpena staff have verified this during past inspections.

V. Testing

1. Annual CEMS Audit. The most recent audit was conducted in September 2021
2. Alt fuels sampling. No new alt fuels.
3. Emissions testing while burning alt fuels if required. Testing was not required.

VI. Monitoring/Recordkeeping

1. Monitor, record, and calculate: the daily kiln feed rates in tons, and the daily clinker production rates in tons. Kiln feed rate and clinker production are monitored and recorded by the plant's data acquisition system.
2. Monitor and record the SO₂, NO_x and CO emissions. SO₂, NO_x and CO are monitored using CEMS with readouts of one-minute averages available in the control room (see Emission Limits section above). Records of past emissions are also maintained.

- 3. Calculate CO emissions in tons per 12-month rolling time-period basis each month. CO emissions are tracked and reported annually, no excess CO emissions have been reported.**
- 4. Monitor and record operating parameters for SNCR, DAA, baghouse and dust collectors on a continuous basis. SNCR, DAA, material throughput and baghouse differential pressure are monitored continuously and recorded by the plant's data acquisition system.**
- 5. Calculate SO₂ and NO_x emissions in pound per ton clinker including SSM on a 30-day rolling average as required by ROP. SO₂ and NO_x emissions are calculated on a pound per ton clinker 30-day rolling average basis and maintained.**
- 6. Evaluate and maintain records of supplier certificates of analysis for each delivery of alternate fuels. No alternate fuels were received during the review period.**
- 7. Alt fuel usage in tons of each fuel used on a 12 month rolling basis. 2021 usage was less than 1% for each kiln.**
- 8. Alt fuel usage percentage of each fuel used on a heat input basis. 2021 usage was less than 1% for each kiln.**
- 9. Use acceptable sampling and testing methods for all sampling and or testing for alternate fuels. Certificate of analysis for each shipment.**

VI. Reporting

The following reports are required for FG KG5:

- 1. ROP deviation, annual and semi-annual reports.**

Annual, Semi-annual 1 and Semi-annual 2 reports were submitted on time during the review period and were complete.

- 2. CEMS EER and QA quarterly.**

Quarter reports were submitted in a timely manner and were reviewed as they were received. Several instances of excess emissions and excessive monitor downtime were reported during the reporting period.

PC MACT Operations and Maintenance Plant semi-annual summary reports have been received and were reviewed at that time.

- 4. Notifications: Testing notifications, Alternative fuel supplier, Alternate fuels procurement plan, MAP.**

Test notifications for 2020 and 2021 were provided in accordance with the ROP timelines. No alternate fuel supplier certification records were required.

Semi-annual CAM excursion/exceedance and monitor downtime reports have been submitted and were reviewed at the time they were received.

VIII. Stack/Vent Restrictions

FG KG5 includes one stack for each kiln (SV25-289, SV25-290, and SV25-291) Stack parameters for each are a maximum diameter of 156 inches and minimum height of

220 feet. Actual dimensions were not verified during this PCE but the stacks dimensions have not been altered during the review period.

IX. Other

1. COM Monitoring Plan.

2. SO₂, NO_x, CO Monitoring/QAQC plan.

Lafarge has approved versions of the required Monitoring Plan/QAQC Plan, MAP, and CAM.

FG KG 6

Kilns 22 and 23 both have emissions controlled by separate SNCR injection systems, baghouses, and a single wet Flue Gas Desulfurization (FGD) scrubber. The SNCR systems inject ammonia directly into the kilns from two storage tanks equipped with a vapor balance system. The baghouses are two large identical units constructed of concrete and containing multiple sections. The baghouses have been reconfigured to flow in the opposite direction from how they were originally designed due the addition of the wet FGD and the need to duct the exhaust from the baghouses over to the Wet FGD and its stack. The old KG6 stack is no longer in use.

FG KG6 is now subject to the PC MACT which has added additional emission limits and emissions monitoring requirements which are included in FG MACT KILNS.

At the time of the inspection alternative fuels (plastics, shingles, wood) were not being burned and only a small amount of shingle fuel was stored on-site at that time.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing
1. VE	20% opacity ²	Six-minute average	FG KG6	0%	NA
2. PM	0.25 pound per 1000 pounds of exhaust ³ 0.07 lb./tn clinker	Test Protocol ^a	FG KG6	NA	See testing section
3. NO _x	5.47 pounds per ton clinker ²	30-day rolling average, as determined at the end of each kiln operating day	EU KILN 22	4.91lbs/tn clinker daily	2021 Quarterly EER; no excess emissions
4. CO	537 tons per year ²	12-month rolling time period as determined	EU KILN 22	Not observed	

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing
		at the end of each calendar month			2021 Quarterly EER; no excess emissions
5. SO ₂	1.98 pounds per ton of clinker ^{2c}	30-day rolling average, as determined at the end of each kiln operating day	FG KG6 (Applies when both kilns operate simultaneously or either kiln operates individually.)	3.7 lb./tn clinker daily	2021 Quarterly EER; no excess emissions
6. NO _x	5.69 pounds per ton clinker ²	30-day rolling average, as determined at the end of each kiln operating day	EU KILN 21	4.91 lb./tn clinker daily	2021 Quarterly EER; no excess emissions
7. CO	539 tons per year ²	12-month rolling time period as determined at the end of each calendar month	EU KILN 23	Not observed.	2021 Quarterly EER; no excess emissions

II. Material Use Limits

Material	Limit	Time Period/ Operating Scenario	Equipment	Observed/Recorded
Plastics	70,822 tons per year	12-month rolling time period	FG KG6	None
Clean wood	42,719 tons per year	12-month rolling time period	FG KG6	None
Shingles	28,432 tons per year	12-month rolling time period	FG KG6	None

4. – 6. Plastic, wood, shingle fuel use 0%,0%, <1% respectively.

7. Plastic fuel quality requirements, non-chlorinated, non-halogenated (<2.0%). Resin codes 1,2,4,5,6,7 only. No plastics fueled.

8. Wood fuel quality. Clean leaf, bark, grass wood. No wood fueled.

9. Shingle fuel quality. Shredded/chipped asphalt roof shingle only. Only processed shingles are used.

The use of alternative fuels, plastics, clean wood, and shingles is limited to 70,822 TPY, 42,719 TPY, and 28,432 TPY of each, respectively. None were delivered in 2021, with only a small amount of shingle fuel on-site at the time of the inspection.

III. Process/Operational Limits

Operating Parameter	Reading
Booster fan inlet pressure (0 - -5 hPa)	- 4 hPa
Scrubber Dp (0.15 – 2.5 hPa)	- 0.25 hPa
Stack outlet temp (40 – 60 deg. C)	47
Scrubber outlet flow (>100 kscfm)	Not observed.
PH (4.0 – 7.0)	5.17
Spray pump pressure (> 15 kPa)	247

1. SNCR, Wet FGD, baghouses and dust collectors are installed, maintained, and operated in a satisfactory manner.

All pollution control equipment appeared to be installed and operating properly. Each kiln is equipped with SO₂, NO_x and CO CEMS which are calibrated, maintained, and operated in accordance with the applicable performance specifications. The Wet FGD operating parameters are monitored as required by the ROP and MAP (see above table).

CEMS for PM, Mercury, O₂, CO₂ and Flowrate have also been installed for PC MACT compliance. SO₂ CEMS are used for SO₂ and HCL surrogate compliance monitoring.

IV. Design Parameters

1. - 3. The KG6 main baghouses were equipped with differential pressure monitoring equipment. The Wet FGD is equipped with method of measuring liquid flow rate (spray pump pressure), pressure differential and outlet temperature.

4. SNCR NH₃STGTANK equipped with vacuum breaker and relief valve set at 25 psi ± 5 psi. Lafarge Alpena staff have verified this is during past inspections.

V. Testing

1. Annual CEMS Audit. The most recent audit was conducted in September 2021.

2. Alt fuels sampling. No new alt fuels.

3. Emissions testing while burning alt fuels if required. Testing was not required.

VI. FG KG6 Monitoring/Recordkeeping

1. Monitor, record, and calculate: the daily kiln feed rates in tons, and the daily clinker production rates in tons, for each kiln. Kiln feed rate and clinker production are monitored and recorded by the plant's data acquisition system. At the time of the inspection feed rates and clinker production were as follows:

EU	KILN FEED	CLINKER PRODUCTION
EU KILN 22	80	50
EU KILN 23	75	50

2. Monitor and record the SO₂ (combined stack), NO_x, and CO emissions from EU KILN 22 and EU KILN 23 on a continuous basis. The WGS is equipped with CEMS and the pollutants are monitored (see above). SO₂, NO_x and CO are monitored using CEMS with readouts of one minute to 24-hour averages available in the control room (see Emission Limits section above).

3. Calculate CO emissions in tons per 12-month rolling time-period basis each month. CO emissions are tracked and reported annually, no excess CO emissions have been reported.

4. Calculate SO₂ and NO_x emissions in pound per ton clinker including SSM on a 30-day rolling average as required by ROP. SO₂ and NO_x emissions are calculated on a pound per ton clinker 30-day rolling average basis and maintained.

5. Calculate and keep records of CO, PM, PM₁₀, PM_{2.5}, and SO₂ emission rates from each emission unit of FG KG5, in tons per year on a calendar year basis. (when burning alternative fuels). Alternative fuels are used in accordance with an approved Alternative Fuels Procurement Plan. No alternative fuels were being fired at the time of the inspection.

8. Alt fuel supplier certificates of analysis. Alternative fuels are used in accordance with an approved Alternative Fuels Procurement Plan

9. Alt fuel usage, monthly and 12-mos rolling. As previously stated, no alternative fuels were being fired at the time of the inspection. There were no alternative fuels on site at the time of the inspection.

10. Alt fuel usage percentage of each fuel used on a heat input basis for plastic, wood, and shingles. No alt fuels usage during the review period.

VII. Reporting

The following reports are required for FG KG6:

1. ROP annual and Semi-annual reports.

Annual, Semi-annual 1 and Semi-annual 2 reports were received on time and complete and were reviewed at the time they were received.

2. CEMS EER and QA quarterly.

The required quarterly CEMS reports have been received and were reviewed at that time.

4. Notifications: Testing notifications, Alternative fuel supplier, Alternate fuels procurement plan, MAP. No alternate fuel supplier certification records were required in during the report period.

Semi-annual CAM excursion/exceedance and monitor downtime reports have been submitted and were reviewed at the time they were received.

VIII. Stack/Vent Restrictions

FG KG6 has one stack (SV26-292A) that is shared between the two kiln processes. Exhaust from each baghouse is combined into one duct which leads to the Wet FGD which is exhausted out SV26-292A. Stack parameters for SV26-292A are a maximum diameter of 100 inches and minimum height of 250 feet. Actual dimensions were not verified during this PCE but the stack appears to be within these specifications and no alterations have taken place since installation.

IX. Other

1. SO₂, NO_x, CO Monitoring/QAQC plan.

Lafarge has approved versions of the required Monitoring Plan/QAQC Plan, MAP, and CAM. A PC MACT Operations and Maintenance plan has also been submitted and approved.

-

FG MACT KILNS

I. EMISSION LIMITS

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing
1. PM	0.07 lb/ton clinker ^{2,b}	30-day rolling average as determined at the end of each kiln operating day. ^a	FG MACT KILNS, the limit applies to each individual kiln/ exhaust stack	NA	0.033 lb/ton clinker 9/12/21 stack test
2. D/F	0.2 ng/dscm (TEQ) corrected to 7% oxygen ² (0.40 ng/dscm(TEQ) if the avg. temperature at the inlet of the first PM	3-hour rolling average	FG MACT KILNS, the limit applies to each individual kiln/ exhaust stack	NA	K22 ≤ 0.0076 ng/dscm @ 7% O ₂ (TEQ) K23 ≤ 0.0048 ng/dscm @ 7% O ₂ (TEQ)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing
	control device during the performance test is 400 °F or less)				
3. Hg	55 lb/MM tons clinker ²	30-day rolling average as determined at the end of each kiln operating day. ^a	FG MACT KILNS, the limit applies to each individual kiln/ exhaust stack	37	0.456 ug/wscm 5/20/21 Stack Test. K21= 26.872lb/ton clinker MAERS calcs K23 = 24.245 lbs/ton clinker, MAERS calcs
4. THC or Total Organic HAP	24 ppmvd corrected to 7% oxygen or 12 ppmvd corrected to 7% oxygen ²	30-day rolling average as determined at the end of each kiln operating day. ^a	FG MACT KILNS, the limit applies to each individual kiln/ exhaust stack	K19=2 K20 NO K21=2 KG6 = 1.7	1.233 ppmvd @7%O2
5. HCL	3 ppmvd corrected to 7% oxygen ²	30-day rolling average as determined at the end of each kiln operating day. ^a	FG MACT KILNS, the limit applies to each individual kiln/ exhaust stack	K19=1.13 K20 N.O. K21=0.59 KG=0.00	NA, SO2 is used as a surrogate for HCL.

III. PROCESS/OPERATIONAL RESTRICTION(S)

- The pollution control equipment is installed, maintained, and operated in a satisfactory manner. Pollution control equipment and compliance is the same as FG KG 5 and FG KG 6.

2. The temperature of the gas at the inlet of the baghouse dust collector for each kiln shall not exceed the temperature established during the most recent performance test. Hourly records from 7/1/21 - 12/31/21 provided in the KilnBHIT tab of the 2022 AQD Records spreadsheet indicated each of the kilns had at least one incident of inlet temperature greater than the avg. established during stack testing. However, most readings were well below the established inlet temps and were well below on average, as depicted in the trend chart I added to the data.
3. Comply with requirements for periods of startup and shutdown:
 - a. Use only natural gas until the kiln reaches a temperature of 1200 °F.
 - b. Use of Primary kiln fuel may commence once the kiln temperature reaches 1200 °F.
 - c. All dry sorbent and activated carbon systems must be turned on and operating when the inlet to the baghouse reaches 300 °F during startup.
 - d. Particulate control and all remaining devices that control hazardous air pollutants should be operational during startup and shutdown.

Lafarge Alpena maintains standard operating procedures for each kiln that address these requirements.

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. Install, calibrate, maintain, and continuously operate a PM Continuous Parameter Monitoring System (CPMS), for each kiln in FG KG5 and in the wet gas scrubber exhaust stack for FG KG6.
Each kiln in FG KG5 and the wet gas scrubber of FG KG6 are equipped with a continuously operating CPMS.
2. The permittee shall install, calibrate, maintain, and operate a permanent weigh scale system to measure and record either; the amount of clinker produced in tons per hour, or the amount of feed to the kiln in tons per hour, as described in Appendix 3.
A weigh scale is used to measure the amount of clinker produced in tons per hour from each kiln group and individual kiln apportionment is determined using the method in Appendix 3.1 of the ROP.
3. Install, calibrate, maintain, and continuously operate a Continuous Monitoring System (CMS) to record the temperature of the exhaust gases from each kiln at the inlet of the kiln baghouse to ensure compliance with applicable D/F emission limit.
Each Kiln is equipped with a CMS for continuous baghouse inlet temperature monitoring.
4. Install and operate a mercury CEMS in accordance with Performance Specification 12A of Appendix B to 40 CFR Part 60.
5. Install, operate, calibrate, and maintain an instrument for continuously measuring and recording the exhaust gas flow rate to the atmosphere for each kiln in FG KG5 and the wet gas scrubber stack of FG KG6.
The required flow monitors are installed and operating.
6. Install, operate, and maintain a THC CEMS.
THC CEMS are installed in the exhaust of each kiln in FG KG5 and in the Wet Gas Scrubber stack of FG KG6.

7. Monitor HCL emissions continuously in accordance with procedures set forth in 40 CFR 63.1350(l)(1) for each kiln in FG KG5 and continuously monitor SO2 emissions as a surrogate for HCL for the wet gas scrubber exhaust stack in FG KG6. Each kiln in FG KG5 is equipped with an HCL CEMS and SO2 is monitored as a surrogate for HCL in FG KG6

V. Testing

2. 5 yr. PM testing. The results of the most recent stack testing from 2020 and 2021.

EU	LIMIT	TEST RESULT
EU KILN 19	0.07 pound per ton clinker.	0.02
EU KILN 20	0.07 pound per ton clinker.	0.02
EU KILN 21	0.07 pound per ton clinker.	0.01

PC MACT PM emission limit and monitoring testing has been conducted in 2020, 2021, and 2022 to demonstrate compliance with 0.07 lb./ton clinker emission rate and establish operating parameters for PM CPMS for each of the kilns. Stack test protocols, tests and test results were reviewed as they occurred and documented in MACES.

Required PM, HCL, Mercury, Dioxin/Furan, THC and CEMS RATA testing were all conducted in 2021. Stack test protocols, tests and test results were reviewed as they occurred and documented in MACES. The test results are used in the calculations for compliance with the emission limits in FG MACT KILNS.

VI. MONITORING/RECORDKEEPING

1. Maintain the average operating parameter values of the PM CPMS within the established operating parameter limits.
Kilns 19 and 20 had deviations outside the established operating limits (SSOL) during the review period. These deviations were reported and identified in quarterly EER reporting. Testing to re-establish a new SSOL was conducted within 30 days.
2. Maintain the average operating parameter values of the PM CPMS within the established operating parameter limits.
Kilns 19 and 20 had deviations outside the established operating limits (SSOL) during the review period. These deviations were reported and identified in quarterly EER reporting. Testing to re-establish a new SSOL was conducted within 30 days.
3. The permittee must demonstrate continuous compliance by using all quality-assured hourly average data collected by the PM CPMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (milliamps) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day.
The PM CPMS is operated and data collected in accordance with this requirement.

Records are provided with each Quarterly EER..

4. **For any exceedance of the 30 process operating day PM CPMS average value from the established operating parameter limit, the permittee must: visually inspect the APCD; take corrective action as soon as possible and return the PM CPMS measurement to within the established value; and conduct a PM emissions compliance test to determine compliance with the PM emissions limit and to verify or re-establish the PM CPMS operating limit within 45 days. Based on the records discussed above and AQD staff firsthand experience, Lafarge Alpena is following these requirements.**
5. **The permittee shall continuously monitor and recording the temperature of the exhaust gases from each kiln in FG KG5 and the wet gas scrubber stack of FG KG6 to demonstrate continuous compliance with the D/F limit. Lafarge Alpena has properly equipped the emission units with inlet temperature monitors that operate continuously. Current data is available on the plant DAS system as well as past data including temperature trends.**
1. The permittee shall monitor and record the Mercury emissions from FG MACT KILNS on a continuous basis in a manner and with instrumentation acceptable to the AQD. At the time of the inspection, mercury CEMS were in place and operating. Records of past operation are maintained and available.
2. The permittee shall monitor and record the THC emissions from FG MACT KILNS on a continuous basis in a manner and with instrumentation acceptable to the AQD. At the time of the inspection, THC CEMS were in place and operating. Records of past operation are maintained and available.

The permittee shall monitor and record the HCL emissions from FG MACT KILNS on a continuous basis in a manner and with instrumentation acceptable to the AQD. At the time of the inspection, HCL CEMS/SO₂ surrogate CEMS were in place and operating. Records of past operation are maintained and available.

8.-10.The permittee shall determine the hourly clinker production in one of two methods depending on the method of measurement determined pursuant to SC IV.2:²

Lafarge Alpena uses the Alternate Monitoring Plan found in Appendix 3.1 to determine the hourly clinker production rate and the PM emission rate in pounds of PM per ton of clinker based on a 30 day rolling average.²

13.The permittee shall keep records of the date, time and duration of each malfunction that results in a failure to meet an applicable standard;

Lafarge follows the standard ROP reporting requirements for exceedances.

VII. REPORTING

4. and 5. Excess emissions and exceedances are reported as they occur and in the quarterly and semi-annual ROP reporting.

8. EPA CEDRI Reporting. Lafarge Alpena has been submitting reports to CEDRI as required.

VIII. STACK/VENT RESTRICTION(S)

NA

IX. OTHER REQUIREMENT(S)

NA

FG CLINK COOL

During the inspection we observed the clinker coolers and dust collectors, handling conveyors and dust collectors, and the off-spec clinker handling elevator and dust collector. We inspected the clinker coolers for all 5 kilns which are addressed in FG CLINK COOL. The clinker coolers receive clinker directly from the kilns and use forced air to cool the material. The clinker cooler dust collector stacks are equipped with PM Continuous Parameter Monitoring System (CPMS) monitors to detect PM emissions.

Each of the clinker coolers serving KG6 has two dust collectors one for the cooler emissions and one for clinker handling (conveyors). There were no visible emissions and the dust collectors appeared to be operating properly.

The FG KG5 coolers (3) are controlled by one large dust collector (plant id no. 25-507) that has two stacks (emissions from half the baghouse sections go to one stack and emissions from the other sections go to the second). Each of these stacks is equipped with a PM CPMS referred to as Fan 92 and Fan 93. The baghouse was installed and operating and there were no visible emissions at the time of the inspection.

The PM CPMS were installed and operating. These units include a display that reads out in micrograms/cubic meter but have not been certified for this type of use (PM CEMS). They are currently used as PM CPMS which relay a milliamp reading to the plant computer system as monitored in the control room. This reading has been correlated to PM emissions testing most recently conducted in July 2021 to set a source specific operating limit not to exceed. Operating limit trend data (attached) indicates compliance with the operating limits on a 30-day rolling average basis. Though there were some brief individual exceedances of the SSOL number.

There is also one dust collector serving the off-spec clinker handling elevator which handles clinker from both coolers.

We did not observe any visible emissions from this equipment.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing
PM	109.0 tons per year ²	12-month rolling time period as determined	FG CLINK COOL	NA	59.5 tons total (MAERS)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Emissions observed during inspection	Emissions from Source Recordkeeping / Testing
		at the end of each calendar month			
PM	0.07 pound per ton clinker ²	30-day rolling average, as determined at the end of each kiln operating day	FG CLINK COOL Applies individually	NA	Company records indicate emissions ranged from 0.01 to 0.034 lb/ton

II. Material Limits

There are no applicable material limits.

III. Process/Operational Restrictions

FG CLINK COOL is equipped with the required dust collectors which were equipped with PM CPMS and appeared to be operating properly. An O&M/MAP for FG CLINK COOL was most recently approved on 11/12/ 2017.

CPMS System Operation

PROCESS/CONTROL DEVICE	CPMS READING (ma) Observed During Inspection	Current CPMS SSOL
92 FAN	4.09	6.33
93 FAN	4.70	5.53
EU CLINK COOL 22	Not observed	5.06
EU CLINK COOL 23	Not observed	4.94

IV. Design/Equipment Parameters

NA

V. Testing

Lafarge Alpena conducted PM emissions testing on the Clinker Coolers in July 2021. After several revisions of the test report, the test results have been reviewed and approved by AQD. The emissions data and PM CPMS operating parameters cited are from the most recent approved testing. Additional testing was conducted in July and August to reset the mA operating limit but results were not received at the time of this report.

1. Annual PM testing. Last test date: July 2021

PROCESS/CONTROL DEVICE	Test Result (lb./ton clinker)	CPMS Limit from 2021 Test (ma)
92 FAN	0.013	6.33
93 FAN	0.015	5.53
EU CLINK COOL 22	0.013	5.06
EU CLINK COOL 23	0.008	4.94

VI. Monitoring/Recordkeeping

The requirement for COMS was removed in the re-permitting under PTI 171-15 since the CPMS monitoring systems were installed. The CPMS monitors have been correlated to PM emission rates during stack testing. The CPMS were operating at the time of the inspection and readings (in milli amps) are available on the control room screen. The PM CPMS were satisfying the requirement for continuous PM compliance monitoring. The attached record of 2021 CPMS readings also indicates the Clinker Cooler operating ranges appear to have been in the range of the limits established during stack testing with brief exceptions.

7. Calculate the PM emissions in tons per year on a monthly and 12-month rolling time period basis as determined at the end of each calendar month.

CC19 = 10.5 tpy, CC20 = 9 tpy, CC21 = 10.5 tpy, CC22 = 15.5 tpy, CC23 = 14 tpy for a total of 59.5 tons per year, see Section I.

VII. Reporting

The following reports are required for FG CLINK COOL:

1. ROP annual and Semi-annual reports. Annual, Semi-annual 1 and Semi-annual 2 reports were received on time and complete.
2. PCMACT Annual and Semi-annual reports. These are PM CPMS monitor reports submitted through CEDRI.

VIII. Stack/Vent Restrictions

During the inspection, we observed each of the CC stacks and they appear to meet the permitted limits. CC 19, 20, and 21 vent through one baghouse with two stacks (SV25-507 and SV25-507A) each stack is limited 84 inches in diameter and must be taller than 50 feet. CC22 and CC23 each have their own baghouse and the stacks are square and must have maximum cross-sectional area of 215 square inches and a minimum height of 27.5 feet.

IX. Other Requirements

This section simply requires the Permittee to comply with the PC MACT and NSPS.

PCE 2 Summary:

This PCE addresses compliance with MI-ROP-B1477-2020b for Flexible Groups FG FUEL HAND, FG KG5, (Kilns 19, 20, and 21) FG KG6 (Kilns 22 and 23) and for FG CLINK COOL, the clinker coolers for FG KG5 and FG KG6. As indicated in the details of the report, there were no issues of non-compliance identified.

NAME



DATE

SUPERVISOR
