

US EPA ARCHIVE DOCUMENT

**PREVENTION OF SIGNIFICANT DETERIORATION PERMIT
FOR GREENHOUSE GAS EMISSIONS
ISSUED PURSUANT TO THE REQUIREMENTS AT 40 CFR § 52.21**

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 6

**PROPOSED DRAFT PSD PERMIT PSD-TX-74-GHG
NUMBER:**

PERMITTEE: CEMEX Construction Materials South, LLC

FACILITY NAME: CEMEX – Balcones Cement Plant
FACILITY LOCATION: 2580 Wald Road
New Braunfels, TX 78132

Pursuant to the provisions of the Clean Air Act (CAA), Subchapter I, Part C (42 U.S.C. Section 7470, *et. Seq.*), and the Code of Federal Regulations (CFR) Title 40, Section 52.21, and the Federal Implementation Plan at 40 CFR § 52.2305 (effective May 1, 2011 and published at 76 FR 25178), the U.S. Environmental Protection Agency, Region 6 is issuing a *Prevention of Significant Deterioration* (PSD) permit to CEMEX Construction Materials South, LLC Balcones Cement Plant (CEMEX) for Greenhouse Gas (GHG) emissions. Emissions of all non GHG pollutants are not addressed in or governed by this authorization.

CEMEX is authorized to increase clinker production from kiln line No. 2 to 3960 tons per day (30-day average) and upgrade the existing burners to multichannel adjustable burners in both the No. 1 and No. 2 kilns in accordance with the permit application (and plans submitted with the permit application), the federal PSD regulations at 40 CFR § 52.21, and other terms and conditions set forth in this PSD permit in conjunction with the corresponding Texas Commission on Environmental Quality (TCEQ) PSD Permit No. 6048/PSD-TX-74M2.

Failure to comply with any condition or term set forth in this PSD permit may result in enforcement action pursuant to Section 113 of the Clean Air Act (CAA). This PSD permit does not relieve CEMEX of the responsibility to comply with any other applicable provisions of the CAA (including applicable implementing regulations in 40 CFR Parts 51, 52, 60, 61, 72 through 75, and 98) or other federal and state requirements (including the state PSD program that remains under approval at 40 CFR § 52.2303).

In accordance with 40 CFR §124.15(b), this PSD Permit becomes effective 30 days after the service of notice of this final decision unless review is requested on the permit pursuant to 40 CFR §124.19.

Wren Stenger, Director
Multimedia Planning and Permitting Division

Date

CEMEX – Balcones Cement Plant (PSD-TX-74-GHG)
Prevention of Significant Deterioration Permit
For Greenhouse Gas EmissionsP
Proposed Draft Permit Conditions

PROJECT DESCRIPTION

The basic steps in cement production include the milling of various raw materials, over 75% of which is limestone, combining those finely ground raw materials to form a meal that is then fed into a kiln (comprised of fired preheaters/precalciners, a fired rotating kiln, and forced draft clinker cooler), progressively heating the material to drive off moisture, to calcine the carbonate bearing materials (limestone, marl), and ultimately to fuse the various materials at very high temperatures ($>2500^{\circ}$ F) in the rotating portion of the kiln system to form molten clinker. The molten clinker forms clinker nodules as it is rapidly cooled using a clinker cooler and then ground together with other additives in the finish mills to form cement. The finely ground cement is then shipped by bulk rail or truck. GHG emissions are generated in cement production from two distinct sources: so called 'process' related emissions which are those from the calcining of limestone or marl to form lime, which liberates CO₂ in the process and from the combustion of the various fuels in the preheaters/precalciners and in the rotating kiln itself where the various raw materials are fused by high temperature to form cement clinker.

This permit authorizes GHG emissions for both the kiln line No. 1 and kiln line No. 2. Each of these lines is comprised of an in-line raw mill, raw material blending silos, preheaters, precalciners, a rotary kiln, clinker cooler, and solid fuel mills. Additional equipment at the site includes raw material handling systems, finish milling equipment, baghouses to capture product and to control particulate emissions, ancillary equipment and processes at the site including shipping systems, gaseous pollutant control systems and alternative fuel receiving, handling, and preparation systems, but none of the other systems result in GHG emissions.

This project includes two distinct changes to the kiln lines at the site. The first change affects kiln line No.2 only, and authorizes increased emissions to raise an existing production limitation from 3,600 to 3,960 tons of clinker per day (30-day rolling average). Clinker production from the kiln line No.1 remains unchanged at 3,250 tons of clinker per day (30-day rolling average). The kiln line No.2 production rate of 3,960 ton per 30- day rolling average requires no physical change to the kiln line to achieve but rather can be derived from the system as it was constructed in 2008.

The second change at the site addressed by this permit includes GHG emissions from the effect of upgrades to the main kiln burners in both kilns to multichannel adjustable units. The upgrades consist of adding a channel to allow the use of alternative fuels such as biomass and refuse derived fuel in the main kiln burners, fuels which were previously authorized in permit PSD-TX-74M1. The burner upgrades will not increase the maximum fuel firing rate for either kiln but will increase flexibility in the amount and kind of fuels (the fuel mix) that can be burned in the main kiln and result in potential energy efficiency improvements. The list of authorized fuels can be found in permit PSD-TX-74M1. That permit authorized the firing of natural gas, coal, and petroleum coke (pet coke) as primary fuels and also authorized multiple, specifically identified alternative fuels including wood products, carpet fibers, shingles, oil filter fluff, rice husks, and cotton gin residue. PSD-TX-74M2, among other things continues to govern the authorized and unchanged list of fuels that may be fired in either kiln line.

EQUIPMENT LIST

The following processes (identified by Facility Information Numbers (FIN) and Emission Point Number (EPN) are subject to this GHG PSD permit.

FIN	EPN	Description
KF13	PS-16	Kiln line No. 1 is used to produce cement clinker. The line includes kiln No. 1, the associated clinker cooler, preheated air from the clinker cooler being routed to the coal mill to dry the solid fossil fuel, preheater/precalciners with their fuel firing capacity and kiln fuel firing emissions which are routed through the inline raw mill when needed to dry the raw feed and then through the kiln No.1 main baghouse prior to discharge at EPN PS-16.
KILN2	PS-77	Kiln line No. 2 is used to produce cement clinker. The line includes kiln No. 2, the associated clinker cooler, preheated air from the clinker cooler being routed to the coal mill to dry the solid fossil fuel, preheater/precalciners with their fuel firing capacity and kiln fuel firing emissions which are routed through the inline raw mill when needed to dry the raw feed and then through the kiln No.2 main baghouse prior to discharge at EPN PS-77.

I. GENERAL PERMIT CONDITIONS

A. Permit Expiration

1. As provided in 40 CFR §52.21(r), this PSD Permit shall become invalid if construction:
 - a. is not commenced (as defined in 40 CFR §52.21(b)(9)) within 18 months after the approval takes effect; or
 - b. is discontinued for a period of 18 months or more; or
 - c. is not completed within a reasonable time.
2. Pursuant to 40 CFR §52.21(r), EPA may extend the 18-month period upon a written satisfactory showing that an extension is justified.

B. Permit Notification Requirements

1. Permittee shall notify EPA Region 6 in writing and by electronic mail of the:
 - a. date construction is commenced, postmarked within 30 days of such date;
 - b. actual date of initial startup, as defined in 40 CFR §60.2, postmarked within 15 days of such date. The notice shall include a description of how the energy efficiency system design elements identified in Special Condition No. II.B.3 have been implemented at the site;
 - c. date upon which initial performance tests will commence, in accordance with the provisions of Special Condition No.II.D, postmarked not less than 30 days prior to such date. Notification may be provided with the submittal of the performance test protocol required pursuant to Special Condition No.II.D.2.

C. Facility Operations

At all times, including periods of startup, shutdown, and maintenance, Permittee shall, to the extent practicable, maintain and operate the facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the EPA, which may include, but is not limited to, monitoring results, review of operating maintenance procedures and inspection of the facility.

D. Malfunction Reporting

1. Permittee shall notify EPA by mail within 48 hours following the discovery of any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner, which results in an increase in GHG emissions above the allowable emission limits stated in Section II of this permit.
2. Within 10 days of the restoration of normal operations after any failure described in General Condition I.D.1 of this permit, Permittee shall provide a written supplement to the initial notification that includes a description of the malfunctioning equipment or abnormal operation, the date of the initial malfunction, the period of time over which emissions were increased due to the failure, the cause of the failure, the estimated resultant emissions in excess of those allowed in Section II, the methods utilized to mitigate emissions and the date normal operations were restored.
3. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violation of this permit or any law or regulation such malfunction may cause.

E. Right of Entry

1. EPA authorized representatives, or representatives of any air pollution control program with jurisdiction, upon the presentation of credentials, shall be permitted:
 - a. to enter the premises where the facility is located or where any records are required to be kept under the terms and conditions of this PSD Permit;
 - b. during normal business hours, to have access to and to copy any records required to be kept under the terms and conditions of this PSD Permit;
 - c. to inspect any equipment, operation, or method subject to requirements in this PSD Permit; and,
 - d. to sample materials and emissions from the source(s).

F. Transfer of Ownership

In the event of any changes in control or ownership of the facilities to be constructed, this PSD Permit shall be binding on all subsequent owners and operators. Permittee shall notify the succeeding owner and operator of the existence of the PSD permit and its conditions by letter; a copy of the letter shall be forwarded to EPA Region 6 within thirty days of the letter signature.

G. Severability

The provisions of this PSD Permit are severable, and, if any provision of the PSD Permit is held invalid, the remainder of this PSD Permit shall not be affected.

H. Adherence to Application and Compliance with Other Environmental Laws

Permittee shall construct and operate this project in compliance with this PSD Permit, the application on which this permit is based, TCEQ PSD Permit PSD-TX-74M2 and all other applicable federal, state, and local air quality regulations. This PSD permit does not release the Permittee from any liability for compliance with other applicable federal, state and local environmental laws and regulations, including the Clean Air Act.

I. Acronyms and Abbreviations

AVO	Auditory, Visual, and Olfactory	lb	Pound
BACT	Best Available Control Technology	LDAR	Leak Detection and Repair
CAA	Clean Air Act	MAPD	Methyl Acetylene Propadiene
CC	Carbon Content	mmBtu	Million British Thermal Units
CCS	Carbon Capture and Sequestration	MSS	Maintenance, Start-up and Shutdown
CEMS	Continuous Emissions Monitoring System	NAAQS	National Ambient Air Quality Standards
CFR	Code of Federal Regulations	NNSR	Nonattainment New Source Review
CH ₄	Methane	N2O	Nitrous Oxides
CO ₂	Carbon Dioxide	NSPS	New Source Performance Standards
CO ₂ e	Carbon Dioxide Equivalent	PSD	Prevention of Significant Deterioration
dscf	Dry Standard Cubic Foot	QA/QC	Quality Assurance and/or Quality Control
EF	Emission Factor	SCFH	Standard Cubic Feet per Hour
EPN	Emission Point Number	SCR	Selective Catalytic Reduction
FIN	Facility Identification Number	TAC	Texas Administrative Code
FR	Federal Register	TCEQ	Texas Commission on Environmental Quality
GCV	Gross Calorific Value	TOC	Total Organic Carbon
GHG	Greenhouse Gas	TPY	Tons per Year
gr	Grains	USC	United States Code
GWP	Global Warming Potential	VDU	Vapor Destruction Unit
HHV	High Heating Value	VHP	Very High Pressure
hr	Hour	VOC	Volatile Organic Compound
HRSG	Heat Recovery Steam Generating		
LAER	Lowest Achievable Emission Rate		

II. PERMIT SPECIAL CONDITIONS

A. Fuel Firing, Clinker Production, GHG emissions, and BACT Limitations

Fuel firing, clinker production, GHG emissions, and BACT limitations for the facility are listed in Table 1 and may not be exceeded.

Table 1. Maximum annual heat input, clinker production, emissions limitations, and BACT limitations for kiln lines 1 and 2.

FIN	EPN	Description	Maximum Heat Input Limitation ¹	GHG Mass Basis Limitation ¹		CO ₂ e Limitation ¹	BACT Limitation	
			MMBtu/year	GHG ²	TPY ²	TPY ²	Rolling 12-month average	
KF13	PS-16	Kiln line No. 1 used to produce cement clinker.	4,102,239	CO ₂	463,088	463,088	0.41 ton CO ₂ e /ton clinker from fuel firing	
				CH ₄	49.74	1,045		
				N ₂ O	7.24	2,244		
				Total	--	466,377		
KILN2	PS-77	Kiln line No. 2 used to produce cement clinker.	4,998,420	CO ₂	564,254	564,254	0.41 ton CO ₂ e /ton clinker from fuel firing	
				CH ₄	60.61	1,273		
				N ₂ O	8.82	2,734		
				Total	--	568,261		
FIN	EPN	Description	Maximum Clinker Production Limitation ¹	GHG Mass Basis Limitation ¹		CO ₂ e Limitation ¹	BACT Limitation	
			Tons/day 30-day rolling average	Tons/yr 12-month rolling total	GHG ²	TPY ²	TPY ²	
KF13	PS-16	Kiln line No. 1	3,250	1,137,500	CO ₂	614,250	614,250	0.54 ton CO ₂ e/ton clinker from raw material calcinations
KILN2	PS-77	Kiln line No. 2	3,960	1,386,000	CO ₂	748,440	748,440	0.54 ton CO ₂ e/ton clinker from raw material calcination
Both Kiln Systems Total (fuel firing and calcination)				CO ₂	2,390,032	2,397,328	0.95 tonCO ₂ e / ton clinker for each kiln system	
				CH ₄	110.35			
				N ₂ O	16.06			

1. All annual limitations are based on a rolling 12- month period unless otherwise noted. Maximum heat input limitation is based on all fuels combined total heat input (million BTUs per year) in a rolling 12-month total. The fuel firing, production, emissions and BACT limitations specified in this table are not to be exceeded for this facility and include emissions from the facility during all operations, including maintenance, startup, and shutdown activities.
2. GHG= Greenhouse Gas. TPY=total short tons per year, based a 12-month rolling total. CO₂e values calculated by multiplying the TPY mass basis limitation value by the Global Warming Potentials (GWP): CO₂=1, CH₄ = 21, N₂O = 310.

B. Workpractices and Operational Limitations

1. Fuel Firing
 - a. Maximum annual fuel firing (mmBtu/yr) in each respective kiln line is not to exceed the values in Table 1 of this permit.
 - b. Fuel types authorized for firing and limitations placed on fuel used in either kiln line shall be limited as follows:
 - (1) natural gas;
 - (2) coal;
 - (3) petroleum coke (pet coke); and
 - (4) non-hazardous alternate fuels, engineered fuels, or fuel blends consisting of the following:
 - (i) biomass, including, but not limited to: rice husks, agricultural residues, grasses, stover, straw, chaff, hulls, and cotton gin residue;
 - (ii) oil containing materials, including, but not limited to: on-site and off-site generated oil filter fluff, oily rags, oily wood, carbon black, absorbents, and grease;
 - (iii) plastics: post industrial packaging film, plastic labels, and shredded plastic;
 - (iv) tire derived fuel (TDF) and rubber products, including, but not limited to: tubes, plugs, seals, and tire manufacturer trimmings, in shredded or whole form;
 - (v) wood, including, but not limited to: sawdust, woodchips, pallets, crates, carpenter shop waste, brush, bark, seed shells, seeds, dyed pallets, creosote treated wood (including utility poles and railroad ties), and untreated and unpainted wood; and,
 - (vi) others: biosolids, cardboard, carpet products, construction and demolition waste, geotextile fabric, hydrocarbon liquids, label waste, non-asbestos shingles, paper, post-industrial personal care material, printed paper, and wax.
 - c. Cemex shall incorporate lower GHG emitting fuels than coal and petroleum coke into the mix of fuels fired in the kiln lines such that in any rolling 12 month period, the combined contribution (heat input, mmBTU basis) of fuels other than coal and petroleum coke must be the lesser of 35% of the total sitewide kiln heat input or an amount found through engineering studies completed within the first 24 months of operation after startup to be technically and economically sustainable, as follows:
 - (1) Within 60 days of issuance of this permit, submit for approval a written plan to determine a technologically and economically sustainable fraction of heat input into the kilns from authorized fuels other than coal and petroleum coke to the Air Permits program of EPA Region 6. The written test plan shall not contain confidential information.
 - (2) For the first 24 months after the start of operation of the kilns being fitted with the

multichannel burners, utilize fuels other than coal and petroleum coke for a minimum of 10% of the heat input to the kilns on a 12-month rolling average heat input basis.

- (3) Within 180 days of issuance of this permit, initiate the evaluation plan approved in paragraph (1) of this provision. The evaluation program will end after 12 months or earlier with written approval from either the EPA or from the TCEQ, if a SIP approved TCEQ GHG permitting program is in place in Texas.
- (4) Within three months of completing the evaluation program, submit a report, detailing the results of the evaluation containing at least the most recent 24 months of fuel fired data, by date, fuel type and location, along with daily clinker production data, and projections of future fuel availability by type. The report is to be submitted to the Air Permits section at the address listed in Section III of this permit. The report will be used to determine the appropriate technologically and economically sustainable minimum 12-month average percentage heat input for fuels other than coal and petroleum coke based on the approved test plan results. The 12-month rolling average minimum percentage non coal and petroleum coke heat input percentage is considered to be the maximum annual percentage heat input attributable to all fuels other than coal or petroleum coke achievable and sustainable if demonstrated to be viable for at least 3 months during the test period, considering fuel supply adequacy, and impacts to product quality and cement manufacturing operations.
- (5). Beginning no later than 24 months from the date of this permit issuance the minimum 12-month average heat input to all kiln systems from all fuels other than petroleum coke and coal shall be the lesser of 35% or that value determined in subparagraph (4) of this paragraph.

2. Clinker Production

- a. Maximum annual clinker production (12-month rolling total) and daily average (30-day rolling average) clinker production is limited for each respective kiln line not to exceed the values in Table 1 of this permit.
- b. The BACT limitations for each kiln line as listed in Table 1 shall not be exceeded for each kiln line.

3. Kiln line equipment design, operation, and workpractices

- a. Burners for use in both kilns shall be multichannel adjustable burners.
- b. The fuel supply system shall be capable of monitoring and metering the fuel flow for any authorized fuel type.
- b. The combustion systems for both kiln lines, including the multichannel adjustable burners, indirect fired systems, and balance of fuel firing in the various kiln and preheater riser ducts, preheaters and precalciners shall be optimized, operated, and maintained in a manner consistent with the representations made in the permit application dated July 11, 2012 as updated as of August 26, 2013.
- c. Kiln refractory, insulation, seals, and kiln line ductwork shall be maintained in good condition and subject to a written maintenance plan that requires inspection of the

seals and ductwork weekly and inspection of all other components at least as frequently as each major outage, but no less frequently than annually.

- d. Cooling air exhaust from the clinker coolers shall be routed thru the appropriate kiln line components, including the solid fuel driers to maximize heat utilization prior to being discharged to atmosphere through the EPN of the respective kiln line. Except for periods of time when avoidance of severe equipment damage or personnel safety dictates otherwise, kiln exhaust shall be routed thru the low pressure drop cyclones in the multistage preheaters/ precalciners so as to maximize heat utilization by the raw materials prior to being exhausted to atmosphere at the EPN of the respective kiln line.
- e. Kiln drive motors and kiln line fans shall include variable speed/variable frequency drive devices and operated so as to maximize energy efficiency. Kiln drive ID fan motors may have the ability to operate with damper controls when necessary.

C. Monitoring and Recordkeeping

- 1. GHG Operations and Monitoring plan (GHG O&M plan). The permittee must create and maintain, and make available upon request by the EPA or any air pollution control program with jurisdiction, a GHG operations and monitoring plan that is consistent with the requirements of 40 CFR §98.3(g). Such a plan shall include but is not limited to:
 - a. information for all systems used to monitor and track raw material usage, fuel characterization (higher heating value, and other relevant fuel analyses), fuel usage by specific fuel and firing location, clinker production, kiln dust production, kiln dust recirculation or alkali bypass, GHG gas monitoring from both fuel firing and calcination processes and all associated data acquisition, reduction, and archiving processes related to GHG emissions or energy usage of the kiln lines.
 - b. Permittee shall calibrate, operate, maintain, and take corrective action to restore to proper operations the various instruments used to validly monitor fuel flow, clinker production, and any other instrumental measuring devices in accordance with manufacturers' recommendations. For such equipment with no manufacturers recommendations, such calibrations shall be performed no less frequently than annually. Results of any such checks, corrective action taken, and dates of same shall be documented and retained for 5 years from last use.
 - c. All data collected, example calculations, and calculated values shall be retained for a minimum of 5 years from its last use.
 - d. Permittee shall ensure that all required continuous emissions, continuous volumetric flow rate, and continuous stack moisture monitoring systems (if any), and associated data acquisition and storage systems and equipment are installed and all certification tests are completed on or before the earlier of 90 unit operating days or 180 calendar days after the date the unit commences operation. Such systems testing shall include those testing and certifications required in 40 CFR§98.34(c).
 - e. Maintenance activities and any corrective action taken on each systems or element of the kiln lines referenced in Special Condition No II.B.3 shall be documented at the time of the maintenance activities. Repairs and maintenance activities shall include

the cause of the activity, the date the activity was undertaken and completed, the person responsible for the activity and maintenance performed or corrective actions taken, if any.

2. Fuel Firing

- a. For each location in each kiln line that fuel is fired, and for each fuel type fired, fuel usage shall be determined as follows:
 - (1) Continuously monitor and record the fuel usage with an operational non-resettable elapsed flow meter suitable for use for each fuel type or fuel blend being introduced into any point of each kiln line. Valid, quality assured data of fuel usage must be collected for any hour or portion of hour that fuel is fired in any portion of the kiln line. The method of fuel usage data collection, methods and equipment used, method and equipment calibration and associated QA/QC requirements for determining fuel usage shall be documented in the GHG O&M plan required in Special Condition No. II.C.1 of this permit. If any fuel firing data are missing, then follow the procedures of 40 CFR §98.35 to estimate fuel firing for the hour or portion of the hour for which data are missing. Fuel use records for each fuel for each usage location for each hour shall include an indicator if the fuel usage value was derived by missing value procedures.
 - (2) Total fuel usage, by fuel type and firing location, shall be summed and recorded hourly for each clock hour. In addition, concurrent kiln operational status (startup, shutdown, or kiln operating with raw mill on, kiln operating with raw mill off, or kiln line down) shall be identified for each hour fuel is fired for each kiln line. Only those clock hours where no fuel is introduced to any portion of the kiln line for the entire hour may be characterized as kiln line down operational status for the kiln line.
 - (3) Total fuel usage by fuel type, firing location, and kiln line shall be summed for each day and for each month and recorded monthly. Percent of fuel fired by type for each firing location and kiln line shall be calculated and recorded each month.
- b. The annual high heating value (HHV) of each fuel or fuel blend must be determined for each fuel or fuel blend fired, using either a fuel default HHV or by fuel sampling as follows:
 - (1) For fuels listed in Table C-1 of 40 CFR 98 Subpart C, the default annual HHV for the fuel referenced in that table may be used.
 - (2) For any fuel or fuel blend that is not so listed, or for any fuel that the permittee does not wish to use the annual default HHV value found in Table C-1, the procedures listed in 40 CFR §98.33(a)(2)(ii) shall be used to determine the annual HHV for the fuel or fuel blend.
 - (i) The sampling procedures used to collect the samples, the frequency of sampling, and the analytical methods used to conduct the analysis of the samples to determine the annual HHV of the fuel or fuel blend shall be done in accordance with the procedures found in 40 CFR §98.34(a),
 - (ii) The procedures for estimating missing data for any HHV sample outlined in

40 CFR §98.35 shall be followed to supply required but missing HHV sample data.

(iii) The details of the actual sampling, analysis, analytical QA/QC methods, and data collection and reduction for each fuel annual HHV determination shall be documented in the GHG O&M plan required under Special Condition II.C.1 of this permit.

(iv) Records related to HHV determinations shall be created and maintained in accordance with the requirements of 40 CFR §98.3(g) except that the records retention listed in 40 CFR§98.3(g) shall be maintained for 5 years rather than 3 years.

- c. The annual HHV for each fuel or fuel blend shall be calculated monthly for any fuel or fuel blend used in the preceding 12 months based on the data collected in Special Condition II.B.2.b, above. The annual value shall be calculated in accordance with Equation C-2b of 40 CFR§98.34(a)(2).
- d. The 12-month rolling total heat input, in mmBtu/yr shall be calculated monthly for the preceding 12-month rolling period for each kiln line as follows:
 - (1) For each fuel type and fuel firing point, multiply the total fuel used in the relevant 12 months at the point, as derived in Special Condition No. II.C.2.a.(3) of this permit with the annual HHV for the respective fuel type, as derived in Special Condition No. II.C.2.c of this permit.
 - (2) Sum the heat input totals (mmBtu/yr heat input) across all fuel usage points by fuel types for each kiln line for the relevant 12-month period. Use these values to demonstrate compliance both with the kiln line specific annual heat input limitations found in Table 1 of Special Condition No II.A. and with the percent heat input attributable to firing coal and petroleum coke combined and percent heat input for all other fuels combined limits found in Special Condition No. II.B.1.c.
- e. Upon request, permittee shall provide a sample and/or analysis of the fuel that is fired in any unit covered by this permit at the time of the request, or shall allow a sample to be taken for analysis by EPA or any air permitting authority with jurisdiction.
- f. Create and maintain all records to support the heat input evaluation program required in Special Condition No. 2.B.C, a copy of the test plan, all data used in the plan execution, and plan report from that study.

3. Clinker Production
 - a. Maximum annual clinker production and daily average (30-day rolling average) clinker production is limited for each respective kiln line not to exceed the values in Table 1.
 - (1) Daily clinker production (in short tons) shall be determined by direct weight measurement of raw kiln feed and application of a kiln specific clinker factor using the same plant techniques used for accounting purposes, consistent with the requirements found in 40 CFR§98.84(d) for each day of production. Production data are to be recorded daily for each kiln line. Daily totals shall be summed and recorded monthly to derive the monthly clinker production total weight in short tons.
 - (2) Annual clinker production shall be calculated and recorded monthly on a 12-month rolling total basis using the data collected in Special Condition No II.C.3.a(1) of this permit. Compliance with the production limitation in Table 1 shall be determined using this data.
 - b. Clinker production for each kiln line shall be determined by direct weight measurement of raw kiln feed and application of a kiln specific clinker factor using the same plant techniques used for accounting purposes in accordance with the requirements found in 40 CFR §98.84(d) using the monitoring and QA/QC requirements found in 40 CFR §98.84. Total clinker production in short tons must be determined for each month the kiln line operates for any period of time during the month. When quality assured clinker production weight data are not available, supply missing data in accordance with the requirements found in 40 CFR §98.85(c).
 - c. Determine on a monthly basis the kiln specific clinker emission factor for each kiln line at the facility in accordance with the requirements of 40 CFR §98.83(d)(2)(i), following the relevant requirements of 40 CFR §98.84 for data collection and QA/QC requirements and 40 CFR §98.85 for missing data procedures.
 - d. Determine the kiln specific clinker kiln dust emission factor monthly in accordance with the provisions of 40 CFR §98.83(d)(2)(ii) and the CO₂ emissions from raw materials in accordance with the method listed in 40 CFR§98.83(d)(3), reporting the CO₂ emissions from raw materials on a short ton basis. Determination of these two parameters shall be accomplished following the relevant requirement of 40 CFR §98.84 for data collection, monitoring, and QA/QC requirements. The clinker dust emissions factor shall be calculated monthly and be based on data gathered in the preceding 3 calendar months.
4. Determining CO₂ emissions attributable to processing from each kiln line.
 - a. Determine and record monthly the CO₂ mass emission rate in short tons per month attributable to process emissions for each kiln using the data collected in Special Condition No. II.C.3 of this permit, making the calculations in a manner consistent with the requirements of 40 CFR§98.33(d)(2), in units of short tons.
 - b. Calculate and record each month the annual 12-month rolling total CO₂ emissions attributable to process emissions for each kiln.

5. Monitoring total GHG emissions from each kiln line.
 - a. Determine hourly average CO₂ mass emissions rate, in short tons, from each kiln line by using continuous monitoring systems (CMS) in accordance with the requirements of Tier 4 calculation methodology found in 40 CFR§98.33(a)(4) and all associated requirements for Tier 4 calculations in 40 CFR 98 Subpart C (General Stationary Fuel Combustion Sources), including monitoring and QA/QC requirements of 40 CFR§98.34 and the missing data procedures of 40 CFR §98.35. The valid CMS generated data are to be used to determine the hourly average CO₂ mass emissions rate, in short tons, for each hour fuel is fired for any amount of time in any part of a kiln system. In addition, to recording the kiln line CO₂ emissions rate, concurrent indication of kiln line operational status (normal operations, startup, shutdown, normal operations, in-line mill on or off) for each clock hour shall also be recorded. The methods used must be documented in the GHG O&M plan as required in Special Condition No. II.C.1 of this permit.
 - b. The procedures found in 40 CFR§98.33(c) shall be used to calculate rolling 12-month total annual mass emissions rate for CH₄ and N₂O emissions, in short tons, from each kiln line. Calculations shall be made based on the total fuel firing and HHV by fuel type or blend for each kiln as derived in Special Condition No. II.C.2. of this permit. Report the emissions in short tons. Calculate and record the emissions by contaminant and fuel type for each kiln line for each month. Sum across all fuel types for each kiln to derive a total mass emissions by contaminant for the month for each kiln. Using the global warming potential values found in footnote 2 in Table 1 of this permit to calculate and record the CO₂e emissions rates for each contaminant per month for each kiln.
 - c. Total daily and monthly CO₂ and CO₂e emissions for each fuel type for each kiln line are to be calculated and recorded monthly. Monthly totals are to be used to calculate and record each month the rolling 12-month total emissions rate of CO₂ and CO₂e.
6. Compliance with 12-month rolling total mass emissions, 12-month rolling total CO₂e emissions limitations and BACT limitations for each kiln line.
 - a. The BACT limitation for each kiln line as listed in Table 1 shall not be exceeded for each kiln line or for the site as a whole.
 - b. Use the data collected in Special Condition No. II.C.5 of this permit to demonstrate compliance with the annual CO₂ and CO₂e emissions limits found in Table 1.
 - c. Calculate the tons CO₂e per ton clinker for each month for each kiln line, by dividing the the total CO₂e emissions for each kiln line by the total clinker production for the kiln line for month. Calculate and record the 12-month rolling average CO₂e per ton clinker each month, using this data to demonstrate compliance with the ton CO₂e per ton clinker BACT limitation of Table 1.
 - d. Calculate and report the BACT limitations of CO₂e per ton clinker attributable to fuel combustion by subtracting the total tons CO₂ per month attributable to process emissions as determined in Special Condition No. II.C.4 of this permit from the total CO₂e emissions per kiln as determined by Special Condition No. II.C.5 of this permit.
 - e. Calculate and record percent of total fuel related CO₂e attributable to each fuel type for each kiln each month, and for each rolling 12-month period. Use this data to

demonstrate, in part, compliance with Special Condition No. II.B.1.c of this permit.

7. Additional Recordkeeping Requirements

- a. Permittee shall maintain a file of all records, data, measurements, reports, and documents related to the operation of the facilities authorized by this permit at the site, including, but not limited to, the following: all records or reports pertaining to significant maintenance performed on any system or device at the kiln lines; duration of startup, shutdown; the initial startup period for the emission units; pollution control units; malfunctions; all records relating to performance tests, calibrations, checks, and monitoring of combustion equipment; duration of an inoperative monitoring device and emission units with the required corresponding emission data; and all other information required by this permit recorded in a permanent form suitable for inspection. The file shall be retained for not less than five years following the date such measurements, maintenance, reports, and/or records are required to be used.
- b. Permittee shall maintain records and submit a written report of deviations from permit requirements, including all excess emissions events, to EPA semi-annually except when more frequent reporting is specifically required by an applicable subpart, or the Administrator or authorized representative, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. The report is due on the 30th day following the end of each semi-annual period and shall include the following:
 - (1) Time intervals, the nature of the deviation or excess emissions event, the data and magnitude of the excess emissions, the nature and cause (if known) of corrective actions taken and preventive measures adopted;
 - (2) Applicable time and date of each period during which the monitoring equipment was inoperative (monitoring down-time);
 - (3) A statement in the report of a negative declaration; that is; a statement when no deviations have occurred or any excess emissions occurred or when the monitoring equipment has not been inoperative, repaired or adjusted;
 - (4) Any failure to conduct any required source testing, monitoring, or other compliance activities; and
 - (5) Any violation of limitations on operation.
- c. Excess emissions shall be defined as any period in which the facility emissions exceed an emission limit set forth in this permit or a malfunction occurs causing such an emissions exceedance. Deviations are instances where compliance with a permit term or condition, or of a permit application representation upon which permit limitations have been based that and that may result in unauthorized emissions or practically render ineffective the ability to determine compliance with any term or condition of the permit.
- d. Excess emissions indicated by GHG emission source certification testing or compliance monitoring shall be considered violations of the applicable emission limit for the purpose of this permit.
- e. Unless otherwise noted, instruments and monitoring systems required by this PSD permit shall have a 95% on-stream time on an annual basis.

D. Initial Performance Testing Requirements:

1. The Permittee shall perform stack sampling and other testing to establish the actual pattern and quantities of air contaminants (as listed in paragraph 3 below) being emitted into the atmosphere from the stacks of kiln line 1 and kiln line 2 (EPNs: PS-16 and PS-77, respectively) to determine the initial compliance with the GHG mass emissions limits established in this permit. Initial performance testing shall be conducted in accordance with 40 CFR§60.8. The holder of this permit is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at his expense. The following methods, found in 40 CFR Part 60 Appendix A unless otherwise noted, shall be used:
 - a. Method 1—Sample and Velocity Traverses for Stationary Sources.
 - b. Method 2—Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube).
 - c. Method 3C—Determination of Carbon Dioxide, Methane, Nitrogen, and Oxygen From Stationary Sources.
 - d. Method 4—Determination of Moisture Content in Stack Gases. Sampling shall be conducted in accordance with 40 CFR § 60.8 and EPA Method 3a or 3b for the concentration of CO₂.
 - e. Method 320 – Measurement of vapor phase organic and inorganic emissions by extractive Fourier transform infrared (FTIR) Spectroscopy.
2. The EPA Region 6 shall be notified in writing as soon as testing is scheduled but not less than 45 days prior to sampling to afford the EPA the opportunity to schedule a pretest meeting. The notice shall include:
 - a. proposed date for pretest meeting.
 - b. Date sampling will occur.
 - c. Name of firm conducting sampling.
 - d. Type of sampling equipment to be used.
 - e. Method or procedure to be used in sampling.The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for submitting the test reports.
3. Air contaminants to be tested for include (but are not limited to) CO₂, CH₄, and N₂O.

Determination of CO₂e emissions shall be made by calculation based on the specific GHG contaminants measured and the global warming potential values found in Table 1 footnote 2 of this permit.

4. Sampling shall occur within 60 days of startup after the modifications are complete and at such other times as may be required by the EPA Region 6 or any pollution control program with jurisdiction. Requests for additional time to perform sampling shall be submitted to the EPA Region 6 office.
5. Testing shall be performed when the feedstock input rate for each unit is at the maximum usable rate for achieving the quality specifications of the clinker being produced at the time.
 - a. The production rate of clinker shall be monitored and recorded during the test, as well as the fuel type firing and firing rate at each fuel firing location in the kiln lines being tested.
 - b. Initial performance testing shall be comprised of at least 3, 1-hr runs, averaged to derive the hourly rate and shall be conducted at or near full production operations. Future operations may not operate in excess of the tested production rate without first establishing the emissions rate through stack testing of higher production limits. The test derived hourly emission rates will be scaled up to 8760 hrs to produce an annualized emissions rate to compare projected compliance with Table 1.
 - c. If the calculated annualized CO₂ emissions rate exceeds 95% of the Table 1 limitation for any given GHG pollutant or for all pollutants combined (CO₂e), then the company shall produce a report along with the required test report identifying how they will operate in order to stay within the limitations of Table 1, and report on progress monthly, including in the report the calculated 12-month rolling total GHG mass emissions rate and CO₂e emissions rate, clinker production, kiln specific clinker emissions factor, for each kiln line for the first 24 months of operation. If the above calculated CO₂ emission total exceeds 90% of the annual limitation listed in Table 1, then performance tests will be required annually, otherwise performance testing shall be repeated at least once every 3 years for each kiln line. This information, together with the sampling results, shall be used to determine hourly emission rates for each GHG and all GHG combined (CO₂e), which will be scaled up by 8760 hrs to produce emissions in short tons per year. This analysis shall appear in the sampling report.
 - d. A copy of the final sampling report shall be forwarded to EPA Region 6 within 60 days after sampling is completed. If reports are required under sub paragraph c of this paragraph, then those reports are due within 60 days of the end of each calendar month.
6. Permittee shall provide, or cause to be provided at permittees expense, performance testing facilities as follows:
 - a. Sampling ports adequate for test methods applicable to this facility,
 - b. Safe sampling platform(s),
 - c. Safe access to sampling platform(s), and
 - d. Utilities for sampling and testing equipment.

III. AGENCY NOTIFICATIONS

Permittee shall submit GHG permit applications, permit amendments, and other applicable permit information to:

Multimedia Planning and Permitting Division
Air Permits Section
EPA Region 6
1445 Ross Avenue (6 PD-R)
Dallas, TX 75202
Email: Group R6AirPermits@EPA.gov

Permittee shall submit a copy of all compliance and enforcement correspondence as required by this Approval to Construct to:

Compliance Assurance and Enforcement Division
EPA Region 6
1445 Ross Avenue (6EN)
Dallas, TX 75202