TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

CEMEX Materials and Construction, Florida, LLC
1200 NW 137 Avenue
Miami, Florida

Miami Cement Plant
Facility ID No. 0250014

PROJECT

Project No. 0250014-047-AC
Application for Minor Source Air Construction Permit
Installation of a Continuous Emissions Monitoring System (CEMS) for Carbon Monoxide (CO)

COUNTY

Miami-Dade County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

December 7, 2012

1. GENERAL PROJECT INFORMATION

1.1. Facility Description and Location

The Miami Cement Plant is an existing Portland cement manufacturing plant, which is categorized under Standard Industrial Classification Code No. 3241. The existing Miami Cement Plant is located in Miami-Dade County at 1200 NW 137 Avenue in Miami, Florida. The UTM coordinates Zone 17, 558.20 km East, and 2851.20 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to state and federal Ambient Air Quality Standards (AAQS). Following is a photograph of the constructed dry process plant.

Cemex Miami Cement Plant in Miami, Florida

This facility consists of the following: a dry-process kiln with pre-heater, precalciner and clinker cooler capable of producing approximately 1,300,000 tons per year of clinker, a limestone quarry and crushing system, material receiving facilities (both by rail and truck), open short-term material storage piles, a storage building for intermediate raw material and clinker storage, a stone dryer & soil thermal treatment plant, a raw mill system, six finish mills, two packhouses, thirty two cement silos, a rail and truck bulk loadout facility, and a liquid fuel tank farm. The dry-process kiln system, installed in the year 2000, replaced the previously existing two wet process cement kilns and clinker coolers in operation at this location for over 30 years.

CEMEX also operates a concrete batch plant and a concrete block plant (Sweetwater) which are located on the adjacent property to the main plant.

The existing facility consists of the following emissions units.

EU No.	*Brief Description*
Regulated Emissions Units	
001	Finish Mill System: Finish Mill No. 1
002	Finish Mill System: Finish Mill No. 2
003	Finish Mill System: Finish Mill No. 3
004	Cement Handling System: (32) Bulk Cement Storage Silos
005	Cement Handling System: Mortar Packhouse
006	Cement Handling System: Cement Packhouse
012	Finish Mill System: Finish Mill No. 4
013	Finish Mill System: Finish Mill No. 5
014	Stone Dryer & Soil Thermal Treatment Facility
015	Cement Handling System: Cement Truck Loading
016	Facility Wide Fugitive Emissions
017	Cement Plant Raw Material Handling (Baghouses)
018	In-Line Kiln/Raw Mill/Clinker Cooler/TIMS/Clean Biomass Feeder System
019	Clinker Handling and Storage System
020	Cement Plant Coal Handling System: Coal Mill System
021	Sweetwater Concrete Block and Concrete Batch Plants
022	Quarry Operations Subject to 40 CFR 60 Subpart OOO: Aggregate Plant Crushers
023	Quarry Operations Subject to 40 CFR 60 Subpart OOO: Other Affected Screening Operations/Belt Conveyors
025	Quarry Operations Not Subject to 40 CFR 60 Subpart OOO
028	Finish Mill System: Finish Mill 6
EU No.	*Brief Description*
Unregulated Emissions Units	
029	Two (2) Diesel Fuel Limited Use Reciprocating Internal Combustion Engines

Emissions of particulate matter (PM) from materials handling sources are controlled by baghouses.

Emissions of particulate matter (PM) from the preheater/precalciner kiln exhaust as well as exhausts from the clinker cooler, raw mill and coal mill are controlled by a baghouse. Emissions of carbon monoxide (CO) and volatile organic compounds (VOC) are controlled by the efficient combustion design (long residence times at high temperatures) of the preheater/precalciner kiln and good operating practices. Emissions of nitrogen oxides (NO_X) are controlled by the combustion design of the FLS kiln (including indirect firing, multiple burn points and low-NO_X precacliner). Emissions of acid gases such as sulfur dioxide (SO_2) and hydrochloric acid (HCl) are controlled by limestone scrubbing as part of the raw

material feed and clinker production. Potential dioxin and furan emissions are controlled by the high-temperature combustion followed by rapid cooling.

To demonstrate compliance with the emission limits specified in the Title V permit, continuous emission monitoring systems (CEMS) in the main kiln/raw mill stack measure and record emissions of NO_X, SO_2, total hydrocarbons or "THC" (which serves as a surrogate for volatile organic compounds or "VOC"). A continuous opacity monitoring system (COMS) measures and records the opacity of the flue gas exhaust in the main kiln/raw mill stack. Monitoring the baghouse inlet temperature to ensure that it is maintained below that of the most recent compliance stack test provides assurance of effective control of dioxins and furans.

The permittee is authorized through the current Title V permit to fire the following fuels: bituminous coal, propane, No. 2 fuel oil, residual oil, flyash, on-specification and off-specification used oil, natural gas, petroleum coke paper currency, oil filters, booms and rags from clean petroleum spill clean ups, unused paper by-products, clean non-chlorinated plastic by-products, whole tires, tire-derived fuel, clean cellulosic biomass, agricultural organic fibrous byproducts. In accordance with Permit 0250014-047-AC, the permittee is authorized to fire *alternate fuel such as* engineered fuels, tire-derived fuel (TDF), roofing materials, plastics, agricultural biogenic materials, cellulosic biomass (untreated and treated), carpet-derived fuel, biosolids, and alternative fuel (AF) mix.

1.2. Facility Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP) subject to the applicable provisions in NESHAP Subpart LLL of 40 CFR 63.
- The facility is an existing Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is an existing major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality. Only VOC emissions have been previously reviewed for PSD and a determination of best available control technology (BACT).

1.3. General Project Description

This permitting action will affect the following emissions unit:

ID No.	Emission Unit Description
018	In-Line Kiln/Raw Mill/Clinker Cooler/TIMS/Clean Biomass Feeder System

The applicant requests to modify the existing construction permit (0250014-016-AC) as follows:

- To replace Method 10 with a CO continuous emission monitoring system (CEMS) with a 30-day rolling averaging as a method of compliance.
- To delete the language regarding the CO process alarm requirement.

CO allowable limit for the kiln system would remain unchanged at 2.81 pounds per ton of clinker, 455 pounds per hour and 1,827 tons per year.

1.4. Processing Schedule

October 9, 2012 Received complete application for a minor source air pollution construction permit.

December 7, 2012 Draft permit mailed out.

1.5. Background

In 2004, the Department issued Non-PSD Permit 0250014-016-AC to increase production from the kiln. The permit included Non-PSD/Non-BACT limits of 2.81 pounds per ton of clinker (lb/ton) and 455 lb/hour. Compliance was specified as an annual stack test using EPA Method 10. To provide reasonable assurance of continuous compliance without requiring installation of an expensive continuous emission monitoring system (CEMS) for CO, the previous operator (Rinker) requested use of an existing (uncertified) CO process monitor. The applicant provided the following rationale.

> *"Rinker's Miami Cement plant has a CO limit of 412 lb/hour and compliance is demonstrated by annual main stack testing. Testing to date has shown that the plant operates well within this limit, but there is no continuous monitoring for CO. There is one process gas analyzer that monitors post-combustion gases for CO, however, it is located in the pre-heater exit, or downcomer duct. Before entering the main stack, this gas stream mixes with the cooler vent gases as well as ambient air from various fresh air dampers. As a result, the CO concentration in the main stack is significantly lower than in the downcomer. Although there is precise calculation relating downcomer CO and main stack CO, alarm points on downcomer CO could be installed to alert the operator that CO emissions are near the limit and that action is needed to correct the situation. Data from previous main stack testing could be used to determine an appropriate alarm set point for the downcomer CO that would provide additional reasonable assurance that the CO permit limit would not be exceeded during normal daily operations."*

The applicant proposed an alarm setting at 1,200 parts per million, by volume (ppmv), to provide a suitable (though not best) method to demonstrate continuous compliance with the specified CO emission limits. The following condition was incorporated into said permit:

<u>CO Process Alarm</u>: The permittee shall add a control room alarm to the existing CO emissions process monitor to alert operators of elevated CO emissions. The alarm shall be set to activate when the process monitor records CO emissions of 1,200 ppmv or more. When an alarm occurs, operators shall take appropriate corrective actions to return CO emissions below the alarm set point. For each incident of an alarm, the operator shall record the following in a written log: date and time of alarm; amount of time above the alarm level; highest concentration above the alarm level; corrective action taken to regain appropriate operating levels. [Rules 62-4.070(3) and 62-212.400(2)(g), F.A.C.]

1.6. Applicant proposal

According to the CEMEX application received in October 2012, the new operator states:

> *"Beginning in 2007, CEMEX (Rinker before this date) has operated the plant with the CO emission limiting standards and monitoring requirements as stated in current Title V permit. Operating the plant within the confines of the 1,200 ppmv process monitor alarm set point has been difficult however; and without a sound basis as there has never been a direct relationship developed between the CO monitor alarm set point (1,200 ppmv) and the CO emission rate from the kiln system stack (2.81 lb/ton clinker). The operational difficulties arise because of the inherent variability in CO emissions from dry process Portland cement plants and from the fact that the alarm set point represents a very short-term averaging time for the CO concentration measurements.*

The applicant has requested removal of the present requirement to use the uncertified CO process monitor and alarm. Instead, Cemex will install a certified CEMS and demonstrate continuous compliance with a 30-day rolling standard.

2. DEPARTMENT REVIEW

The new operator (Cemex) has proposed the measurement methodology recommended by the Department during the review of the earlier project. Although the original applicant (Rinker) claimed otherwise, the Department accepts Cemex's assertion that there has never been a direct relationship between the CO alarm set point and the CO emission rate from the kiln system stack.

For reference, the Department specified CO limits in several PSD/BACT determinations that are actually greater than the Non-PSD/Non-BACT limit with which Cemex must comply. Examples include Florida Rock (Vulcan) Kiln 2, American Cement and Cemex Brooksville South Kiln 2. Each was permitted and actually constructed subject to a CO BACT limit of 3.6 lb/ton on a 30-day basis and with compliance by CEMS.

The Department does not expect an increase in emissions due to the use of a better compliance technique. The Department does not consider the project to constitute a physical or operational change with an increase in emissions. It is not a modification as defined in the Department regulations. Therefore a PSD review and BACT determination are not required.

For reference, CO modeling conducted in 2005 for the nearby larger Titan America (Tarmac) Cement Plant (in Medley, Miami-Dade County) for CO indicated that ground level effects of CO from cement plants are minimal and are orders of magnitude less than the applicable National Ambient Air Quality Standard (NAAQS).

In the case of Titan/Tarmac, the maximum ground-level CO concentration caused by stack emissions is 115 micrograms per cubic meter ($\mu g/m^3$) on a 1-hour basis and 31 $\mu g/m^3$ on an 8-hour basis. The applicable 1-hour and 8-hour NAAQS equate to 40,000 and 10,000 $\mu g/m^3$, respectively.

The Department concludes that Cemex is making a sensible decision regarding CO monitoring and compliance and will issue a permit that specifies CO CEMS as the compliance demonstration method. The requirement for the CO process alarm will be removed. The conditions are indicated in the accompanying draft permit.

3. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions. Teresa Heron, the project engineer, is responsible for reviewing the application and drafting the permit. Al Linero is responsible for reviewing and approving these documents. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Office of Permitting and Compliance at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.