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west virginia department of environmental protection

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Joe Manchin, III, Governor  
Randy C. Huffman, Cabinet Secretary  
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## ENGINEERING EVALUATION / FACT SHEET

### BACKGROUND INFORMATION

Application No.: R14-0026C  
Plant ID No.: 003-00006  
Applicant: Capitol Cement Corporation  
Facility Name: Martinsburg Facility  
Location: Berkeley County  
SIC Code: 3241  
Application Type: Modification  
Received Date: 09-08-09  
Engineer Assigned: Steven R. Pursley, PE  
Fee Amount: \$4,500.00  
Date Received: 09-11-09  
Complete Date: October 2, 2009  
Due Date: December 31, 2009  
Applicant Ad Date: September 16, 2009  
Newspaper: *The Journal*  
UTM's: Easting: 243.5 km      Northing: 4,369.00 km      Zone: 17  
Description: "As built" update to address SO<sub>2</sub> control, the shutdown of Kiln 7 and the reconfiguration of some PM sources and controls.

### DESCRIPTION OF PROPOSED MODIFICATION

This permit application will address 5 changes to the facility.

1. Decommissioning of Existing Kiln No. 7.

Existing Kiln #7 is no longer being proposed to be part of the plant modernization project. Existing Kiln #7 is now proposed to be decommissioned along with existing Kiln #8 and #9. The plant will now only operate the new Preheater/Precalciner kiln system with no change to the permitted annual clinker production of 2,212,890 tons.

2. Addition of an SO<sub>2</sub> Semi-Dry Scrubber.

An SO<sub>2</sub> semi-dry scrubber system is now proposed to be constructed and operated as part of the design of the new PH/PC kiln system. With the addition of the SO<sub>2</sub> scrubber,

a scrubber reagent, consisting of calcium hydroxide lime (i.e. hydrated lime) will be brought in by truck utilizing plant haul roads. The scrubber reagent will be off loaded from the truck to a new scrubber reagent storage silo which will be equipped with a baghouse to control fugitive particulate emissions. The scrubber reagent will then be pumped to a mixing vessel where it will be mixed with water to create a slurry and then piped to the existing gas conditioning tower where new spray nozzles will inject droplets of the reagent into the kiln exhaust gas stream. These droplets will absorb SO<sub>2</sub> before the water droplets evaporate and form dry particulate matter which will then be removed by the existing new kiln fabric filter baghouse.

### 3. Finish Mill Air Heaters

Only one new air heater is proposed. This new air heater will provide process heat to the two proposed new Finish Mills. No new air heater will be required for the existing finish mill which will be a part of the new project. In the previous application, each of the three finish mills had their own dedicated air heater.

### 4. Engineering Design Changes Impacting New and Existing PM and PM<sub>10</sub> Air Emission Sources

Engineering design changes have been made since the submittal of the previous PSD permit application in June 2004 which impact new and existing PM and PM<sub>10</sub> air emission sources. These engineering design changes now represent the “as built” plant.

Specifically, changes to new and existing PM and PM<sub>10</sub> air emission sources include the following:

1. Relocation of the new raw material storage silos, new finish mills and cement storage silo.
2. Changes to the final location, number and design characteristics of the previously permitted new and existing dust collectors.
3. Changes to some of the previously permitted fugitive PM and PM<sub>10</sub> air emission sources which include plant haul roads.

### 5. New Dry Flash System

Capitol Cement Corporation (Capitol) will be modifying their existing West Bank Silos to accommodate a new dry flyash handling and storage system. The dry flyash will serve as an alternate raw material and will provide the necessary silica, iron and alumina required for the production of clinker by the new PH/PC kiln. The dry flyash will replace the use of quarried shale. Use of dry flyash is expected to provide the plant with an environmental benefit since the dry flyash contains significantly less organic matter and pyritic sulfur than is contained in the shale. Use of the dry flyash is expected to result in lower emissions of VOC and SO<sub>2</sub> when the dry flyash is substituted for shale as a raw material.

Additionally, it should be noted that originally Capitol requested changes to their permitted SO<sub>2</sub> emission limits. However, after discussions with the company it has been decided that those requested changes will not be implemented in this permit. During the 180 day shakedown period for the new kiln Capitol will perform testing and will resubmit that request if and when they believe it is still necessary.

### SITE INSPECTION

A site inspection of the facility was performed by the writer on September 30, 2009. Accompanying the writer on the inspection was Capitol Environmental Manger Emily Dyson, Vice President of Environmental Affairs Gary Molchan, Keith Crowley, Production Manager and Miranda Brown of Spectrum Environmental. During the inspection the new sections of the facility were nearing completion but not in operation. Additionally, the old kilns had also already been permanently shut down.

To get to the facility from Charleston take I-79 north to Morgantown. Then take the I-68 exit east to Hagerstown, Maryland. From their take I-81 south to exit 12. At the end of the off ramp turn left and proceed approximately 1.1 miles on Apple Harvest Dive. Then take the South Queen Street exit. At the end of the exit turn right on South Queen Street. The facility is less than 0.5 miles straight ahead.

### ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Controlled annual emissions from the modified facility will be as follows:

<b>Pollutant</b>	<b>Allowable Emissions (tpy)</b>
PM <sub>2.5</sub>	217.89
PM <sub>10</sub>	569.84
TSP	893.63
SO <sub>2</sub>	5702.67
NO <sub>x</sub> (as NO <sub>2</sub> )	4,005.09
CO	4,435.98
VOC	155.96
Fluorides	1.02
Lead	0.08

Note that since NO<sub>x</sub> emissions are increasing from what was previously permitted the netting analysis for that pollutant has to be redone.

Based on production from the facility from September 2000 to August 2002, Capitol has estimated that actual NO<sub>x</sub> emissions from the facility were 6,140.13 tons per year.

Capitol based these emissions on emission factors derived from stack testing performed at the facility during February/March of 2009. Since the WVDAQ was not informed ahead of time that this testing was occurring no DAQ personnel was on site to observe said test. This testing resulted in emission factors ranging from 15.2 pounds of NO<sub>x</sub> per ton of clinker produced for Kiln #8 to 18.6 pounds of NO<sub>x</sub> per ton of clinker for Kiln #9. These emission factors are somewhat higher than previous testing had shown and also higher than Capitol originally claimed in their 2004 application (14.6 pounds per ton). However, if the original emission factor of 14.6 pounds per ton is used, past actual emissions are 5,121 tons. This is still far greater than what is needed for Capitol to net out of PSD review.

## REGULATORY APPLICABILITY

The Capitol Cement Corporation Martinsburg facility is subject to a variety of substantive state and federal air quality rules and regulations. They are as follows: 45CSR1, 45CSR5, 45CSR7, 45CSR10, 45CSR13, 45CSR14, 45CSR16, 45CSR30, 40 CFR 60 Subpart Y, 40 CFR 60 Subpart OOO and 40 CFR 63 - Subpart LLL. Each applicable rule, and Capitol's proposed compliance thereto, will be discussed in detail below. It should be noted that the facility is not subject to 40 CFR 60 Subpart F because 40 CFR 63.1356 exempts it from those requirements.

### ***WV State Regulations***

#### 45CSR1 - NO<sub>x</sub> Budget Trading Program As A Means Of Control And Reduction Of Nitrogen Oxides From Non-Electric Generating Units.

##### **45CSR1 Standard Requirements - Section 100.3**

Pursuant to 45CSR1, Section 100.3, any owner or operator of any Portland cement kiln subject to this section shall not operate the kiln during May 1 through September 30 unless the kiln has installed and operates during May 1 to September 30 with low-NO<sub>x</sub> burners, mid-kiln firing or alternative control techniques, subject to approval by the Administrator, that achieve at least the same emissions decreases as low-NO<sub>x</sub> burners or mid-kiln firing. The new preheater-precalciner kiln will utilize low-NO<sub>x</sub> burners to meet this requirement

##### **45CSR1 Monitoring Requirements - Section 100.6**

§45-1-100.6.a requires any owner or operator of a kiln subject to this section to complete an initial performance test and subsequent annual testing consistent with the requirements of 40 CFR Part 60, appendix A, method 7, 7A, 7C, 7D or 7E. However, §45-1-100.6.b. allows the owner or operator to use the results of continuous emission monitoring system (CEMS) to replace the annual testing requirements set forth in subdivision 100.6.a as long as such equipment is installed and operated consistent with sections 70 through 76 and 40 CFR Part 75. Capitol will utilize the option presented in §45-1-100.6.b. and use CEMS to show compliance.

45CSR5 - To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations. 45CSR5 applies to the fuel handling portion of the facility.

#### **45CSR5 Opacity Limits - Section 3.4**

Pursuant to 45CSR5, Section 3.4, no person shall cause, suffer, allow or permit emission of particulate matter into the open air from any fugitive dust control system which is twenty percent (20%) opacity or greater. Proper maintenance and operation of the baghouses and enclosures should keep the opacity of the units far below 20%.

#### **45CSR5 Fugitive Dust Control System - Section 6.1**

Pursuant to 45CSR 5, Section 6.1, no person shall cause, suffer, allow or permit a coal preparation plant or handling operation to operate that is not equipped with a fugitive dust control system. This system shall be operated and maintained in such a manner as to minimize the emission of particulate matter into the open air. Capitol will meet this requirement through a system of enclosures and baghouses.

#### **45CSR5 Fugitive Dust Control System - Section 6.2**

Pursuant to 45CSR 5, Section 6.2, the owner or operator of a coal preparation plant or handling operation shall maintain dust control of the premises and owned, leased, or controlled access roads by paving, or other suitable measures. Good operating practices shall be observed in relation to stockpiling, car loading, breaking, screening, and general maintenance to minimize dust generation and atmospheric entrainment. Capitol will meet this requirement through the use of a water truck along with enclosures and baghouses.

45CSR7 - To Prevent And Control Particulate Matter Air Pollution From Manufacturing Processes And Associated Operations. 45CSR7 applies to the raw material and product handling portions of the facility.

#### **45CSR7 Opacity Limits - Section 3.1**

Pursuant to 45CSR7, Section 3.1, no person shall cause, suffer, allow, or permit emissions of smoke and/or particulate matter into the open air from any process source operation greater than twenty (20) percent opacity, except as noted in subsections 3.2, 3.3, 3.4, 3.5, 3.6, and 3.7. Proper maintenance and operation of the baghouses and enclosures should keep the opacity of the units far below 20%.

#### **45CSR7 Process Weight Rate Based Emission Standard - Section 4.1**

Pursuant to 45CSR7 Section 4.1, no person shall cause, suffer, allow, or permit particulate matter to be vented into the open air from any type source operation or duplicate source operation, or from all air pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity specified under

the appropriate source operation type in Table 45-7A found at the end of this rule. Since NSPS and MACT requirements for the applicable sources are more stringent than rule 7, compliance with the federal requirements ensures compliance with 45CSR7.

#### **45CSR7 Process Weight Rate Based Emission Standard - Section 4.2**

Pursuant to 45CSR7 Section 4.2, mineral acids shall not be released from any type source operation or duplicate source operation or from all air pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity given in Table 45-7B of that rule. Table 45-7B limits the allowable stack gas concentration of HCl to 210 milligrams per dry standard cubic feet (equivalent to 409.7 lbs per hour for the new kiln and 63.4 lbs per hour for kiln 7). Maximum HCl emissions from the kiln will be 34.4 pounds per hour from the new kiln (based on the AP-42 factor of 0.14 lbs of HCl per pound of clinker produced). Obviously, AP-42 emission factors indicate that emissions from the kilns will be less than one tenth of the 45CSR7 allowable HCl emissions.

#### **45CSR7 Fugitive Dust Control System - Section 5.1**

Pursuant to 45CSR7 Section 5.1, no person shall cause, suffer, allow or permit any manufacturing process or storage structure generating fugitive particulate matter to operate that is not equipped with a system, which may include, but not be limited to, process equipment design, control equipment design or operation and maintenance procedures, to minimize the emissions of fugitive particulate matter. To minimize means such system shall be installed, maintained and operated to ensure the lowest fugitive particulate matter emissions reasonably achievable. Capitol will meet this requirement through a system of enclosures and baghouses.

#### **45CSR7 Fugitive Dust Control System - Section 5.2**

Pursuant to 45CSR7 Section 5.2, the owner or operator of a plant shall maintain particulate matter control of the plant premises, and plant owned, leased or controlled access roads, by paving, application of asphalt, chemical dust suppressants or other suitable dust control measures. Good operating practices shall be implemented and when necessary particulate matter suppressants shall be applied in relation to stockpiling and general material handling to minimize particulate matter generation and atmospheric entrainment. Capitol will meet this requirement through the use of a water truck along with enclosures and baghouses.

#### **45CSR10 - To Prevent And Control Air Pollution From The Emission Of Sulfur Oxides**

#### **45CSR10 In-Stack Sulfur Dioxide Concentration Limit - Section 4.1**

Pursuant to 45CSR10 Section 4.2, no person shall cause, suffer, allow or permit the emission into the open air from any source operation an in-stack sulfur dioxide

concentration exceeding 2,000 parts per million by volume from existing source operations. The new kiln will be equipped with sulfur dioxide CEMS to ensure compliance with this standard. Note that based on the permitted mass emission rate of 2111.3 lb/hr the in-stack sulfur dioxide concentration will be approximately 542 ppm.

#### 45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The modifications at the Martinsburg Plant are subject to 45CSR13 because the increase in emissions is defined as “minor”. Since the increase in emissions of NO<sub>x</sub> exceeds 144 pounds per day, the change could not have been submitted as an administrative update.

#### 45CSR34: Emission Standards for Hazardous Air Pollutants Pursuant to 40 CFR Part 63

45CSR34 incorporates by reference 40 CFR 63, of which the Martinsburg Plant is subject to 40 CFR 63, Subpart LLL. The compliance with Subpart LLL is discussed below under *Federal Regulations*.

### ***Federal Regulations***

#### 40 CFR 60 Subpart Y: Standards of Performance for Coal Preparation Plants

##### **40 CFR 60 Opacity Limits - Section 252(c)**

Pursuant to 40 CFR 60 Subpart Y, Section 252(c), an owner or operator shall not cause to be discharged into the atmosphere from any coal processing and conveying equipment, coal storage system, or coal transfer and loading system processing coal, gases which exhibit 20 percent opacity or greater. Proper maintenance and operation of the baghouses and enclosures should keep the opacity of the units far below 20%.

#### 40 CFR 60 Subpart 000: Standards of Performance for Nonmetallic Mineral Processing Plants

##### **40 CFR 60 Opacity Limits - Section 672(b)**

Pursuant to 40 CFR 60 Subpart 000, Section 672(b) no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any transfer point on belt conveyors or from any other affected facility any fugitive emissions which exhibit greater than 10 percent opacity. Proper maintenance and operation of the baghouses and enclosures should keep the opacity from the transfer points well below 10%

#### 40 CFR 63 Subpart LLL: National Emission Standard for Hazardous Air Pollutants From The Portland Cement Manufacturing Industry

#### **40 CFR 63 Kiln Limits - Section 1343(b)**

Pursuant to 40 CFR 63 Subpart LLL, Section 1343(b)(1), the combined particulate matter emissions from the in-line kiln/raw mill and the alkali bypass shall not exceed 0.15 kg per Mg (0.30 lb per ton) of feed (dry basis). Capitol will verify compliance with this standard by stacktesting within 180 days of startup of the pyroprocessing system for the new kiln.

Pursuant to 40 CFR 63 Subpart LLL, Section 1343(b)(2), the kilns shall not exhibit opacity greater than 20%. Capitol will verify compliance with this standard by installing Continuous Opacity Monitoring Systems (COMS).

Pursuant to 40 CFR 63 Subpart LLL, Section 1343(b)(3), the exhaust from the kiln shall not contain Dioxins/Furans (D/F) in excess of 0.20 ng per dscm ( $8.7 \times 10^{-11}$  gr per dscf) (TEQ) corrected to seven percent oxygen; or 0.40 ng per dscm ( $1.7 \times 10^{-10}$  gr per dscf) (TEQ) corrected to seven percent oxygen, when the average of the performance test run average temperatures at the inlet to the particulate matter control device is 204°C (400°F) or less.

#### **40 CFR 63 Clinker Cooler Limits - Section 1345(a)**

Pursuant to 40 CFR 63 Subpart LLL, Section 1345(a)(1), the new coolers shall not discharge into the atmosphere any gases which contain particulate matter in excess of 0.050 kg/Mg (0.10 lb per ton) of feed (dry basis) to the kiln. Capitol will verify compliance with this standard by stacktesting.

Pursuant to 40 CFR 63 Subpart LLL, Section 1345(a)(2), the new and existing clinker coolers shall not discharge into the atmosphere any gases which exhibit opacity greater than 10%. Capitol will verify compliance with this standard by installing Continuous Opacity Monitoring Systems (COMS).

#### **40 CFR 63 Raw and Finish Mill Opacity Limits - Section 1347**

Pursuant to 40 CFR Subpart LLL, Section 1347, the owner or operator of each new or existing raw mill or finish mill at a facility which is a major source subject to the provisions of this subpart shall not cause to be discharged from the mill sweep or air separator air pollution control devices of these affected sources any gases which exhibit opacity in excess of ten percent. Capitol will verify compliance with this standard by performing daily Method 22 tests as outlined in §40 CFR 63.1350(e).

#### **40 CFR 63 Misc. Source Opacity Limits - Section 1348**

Pursuant to 40 CFR Subpart LLL, Section 1348, the owner or operator of each new or existing raw material, clinker, or finished product storage bin; conveying system transfer point; bagging system; and bulk loading or unloading system; and each existing raw material dryer, at a facility which is a major source subject to the provisions of this subpart shall not cause to be discharged any gases from these affected sources which exhibit

opacity in excess of ten percent. Capitol will verify compliance with this standard by performing Method 22 tests as outlined in §40 CFR 63.1350(a)(4).

### TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

No increase in non-criteria regulated pollutants is expected due to this modification.

### AIR QUALITY IMPACT ANALYSIS

Since this is a minor modification to an existing major stationary source no modeling was performed.

### MONITORING OF OPERATIONS

No additional monitoring above what is already required by R14-0026B is necessary. Specifically, R14-0026B requires the following:

In addition to the monitoring, reporting, and record-keeping required under 40 CFR 63 Subpart LLL and outlined above, Capitol shall also perform the following monitoring, reporting and record-keeping:

- A continuous emission monitoring system (CEMS) shall be installed, operated, and maintained to measure the emissions of SO<sub>2</sub>, NO<sub>x</sub>, and CO from the preheater-precalciner kiln system exhaust stack.
- A continuous opacity monitoring system (COMS) shall be installed, operated, and maintained to measure the opacity from the preheater-precalciner kiln system exhaust stack, and the clinker coolers.
- Within 180 days of startup of the pyroprocessing system, the permittee shall perform EPA approved stack tests on the preheater-precalciner kiln system exhaust stack at least every 5 years to determine VOC, PM and D/F (Dioxin/Furans) emissions.
- The permittee shall maintain daily and monthly records of the amount of clinker produced. Such records shall be retained on-site by the permittee for at least five (5) years and shall be certified and made available to the Director or his duly authorized representative upon request.
- The permittee shall maintain monthly hours of operation for the major processing operations at the facility. Such records shall be retained on-site by the permittee for at least five (5) years and shall be certified and made available to the Director or his duly authorized representative upon request.

## CHANGES TO PERMIT R14-027B

The main changes to permit R14-027B are as follows:

- \* The facility wide emission limitations in condition A.2 were changed.
- \* Tables 2 and 3 (condition A.5) were changed to increase allowable emissions and reflect as built changes.
- \* Tables 4 and 5 (condition A.7) were modified to change allowable emissions and reflect as built changes.
- \* Old condition A.8 was deleted since Kiln 7 will no longer be operated.
- \* New condition A.11(h) was added.
- \* Old condition A.14 was deleted.
- \* Table 6 (new condition A.14) was changed to reflect emission changes.
- \* Old Condition A.17 was deleted.
- \* Tables 7,8, 9, 10 and 11 were modified to change allowable emissions and reflect as built changes.
- \* Old condition A.26 (new condition A.23) was changed to lower emission limits.
- \* Old condition A.27 was eliminated.
- \* Tables 13, 14 and 15 were modified to change allowable emissions and reflect as built changes.

## RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R14-0026C for the modification of a portland cement manufacturing facility in Martinsburg be granted to Capitol Cement Corporation.

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Steven R. Pursley, PE  
Engineer

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Date

Fact Sheet R14-0026C  
Capitol Cement Corporation  
Martinsburg Facility