

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review for RACT Requirements
(in conformance with Section 172(c) of the CAA)

Permit Issue Date: **XX XX** 2009

Region: Mooresville Regional Office
County: Rowan
NC Facility ID: 8000003
Inspector's Name: Tonisha Dawson
Date of Last Inspection: 03/27/2008
Compliance Code: C/In Compliance With
Procedural Reqr

Facility Data			Permit Applicability (this application only)
Applicant (Facility's Name): Carolina Stalite Company Facility Address: Carolina Stalite Company 16815 Old Beattys Ford Rd. Gold Hill, NC 28071 SIC: 3281 / Cut Stone And Stone Products NAICS: 327991 / Cut Stone and Stone Product Manufacturing Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			SIP: NSPS: NESHAP: PSD: PSD Avoidance: NC Toxics: 112(r): Other: RACT Review (No additional control)
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	Application Number: 8000003.08D Date Received: 07/30//2007 Application Type: Modification Application Schedule: TV- Significant Existing Permit Data Existing Permit Number: 03059T37 Existing Permit Issue Date: 09/22/2008 Existing Permit Expiration Date: 06/30/2012
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Review Engineer: Charles F. Yirka Review Engineer's Signature:		Date: XX/XX/2009	Comments / Recommendations: Issue 03059T38 Permit Issue Date XX/XX/2009 Permit Expiration Date: 06/30/2012

I. Introduction and Purpose of Application

The U.S. Environmental Protection Agency (EPA) gave final approval to North Carolina's Title V operating permits program effective on October 1, 2001. This EPA approval triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality (DAQ). Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

The Carolina Stalite Company, Gold Hill facility (Stalite GH) operates a lightweight aggregate production facility at this Rowan County site. The lightweight aggregate is produced from slate that is expanded in large rotary kilns. The facility is permitted to operate seven (7) kilns. The expanded aggregate is crushed, screened, and stockpiled. The expanded aggregate known as "clinker" is then crushed and screened to the desired product size. Stalite GH has two primary product streams with each having a dedicated set of equipment. Currently "Block Mix" represents about 30% of production while "Structural Material" makes up the remaining 70%. The potential annual throughput through the entire Stalite GH facility is based on the kiln production capacity of 1,511,100 tons per year (172.5 tph x 8760 hr/yr).

The primary source of information used to develop this permit is the air permit application. This permit review is for the application of existing source RACT¹ requirements and intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to create the Title V operating permit.

Stalite GH is has the potential to emit more than 100 tons per year of NOx associated with fuel combustion. These emissions result from the kilns for the purpose of producing expanded aggregate. As a result, emission units at the facility are subject to the applicable RACT requirements as per 2D .1402. As per 2D .1403(c) and .1413(b), an affected source must submit a permit application by August 1, 2007 that includes a RACT demonstration and a proposal for demonstrating compliance with the proposed RACT.

Since this modification does involve a case-by-case determination regarding the applicability of RACT, it is being processed as a major modification pursuant to 15A NCAC 2Q .0501(d).

II. Background Information

Stalite GH was notified via letter dated June 4, 2007. A RACT analysis dated July 16, 2007 was then submitted. RST Engineering performed a NOx control technology analysis. The analysis did not identify any technologically feasible and economically viable NOx controls for Stalite GH's rotary kilns. In short, the high process temperatures and air flow rates necessary for rock expansion in the kilns does not support the application of low NOx burner combustion modifications. As discussed in the analysis, post combustion controls such as SCR, SNCR, and oxidizing scrubber systems are not technically feasible or economically viable. Stalite GH therefore concluded that RACT is no control. Furthermore the existing permit limits for NOx, including PSD/BACT NOx limits for Kilns Nos. 5, 6, and 7 at the Gold Hill facility are based on no control.

Finally, on 1/19/09 the DAQ requested Stalite GH consider a relatively new NOx emissions add-on control technology. This control is known as Regenerative Selective Catalytic Control (RSCR). Babcock Wilcox developed this NOx control technology with biomass boilers in mind. It is a new hybrid technology that can allow small power facilities to economically reduce NOx emissions. However, based on the finding of RST Engineering, it appears it is a technologically feasible option for controlling NOx emissions from lightweight aggregate (LWA) kilns as well.

Candidate NOx Control Options:

In 2004 Stalite GH submitted a permit application for a NSR major modification due the installation of Kiln No. 7. The application addressed the application of Prevention of Significant Deterioration (PSD) and Best Available Control Technology (BACT). During this review, no LWA kilns were identified that employed NOx emissions controls. Kilns 5 and 6, installed in 1981, are also PSD units with NOx BACT based on no control.

During the preparation of the 2004 application the existing literature and databases (including the RBLC) were reviewed to identify any demonstrated NOx controls on LWA kilns. No LWA kilns were identified with NOx controls in this updated review. NOx controls on other industrial combustion sources were also identified. These technologies included selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), combustion modifications (low NOx burner designs), and oxidizing scrubber systems (LoTox). Additionally, the possibility of ozone season fuel switching from coal to natural gas was considered. Finally, the add-on control RSCR was considered.

A summary of the analysis follows:

Summary of Candidate RACT Options:

<u>Control Option</u>	<u>Technologically Feasible?</u>	<u>Economically Viable?</u>	<u>Conclusion</u>
Fuel Switching ¹	No	No	Fuel switching not RACT
Oxidizing Scrubber ²	Yes	No \$8,990/ton	Scrubber not RACT

¹ "Reasonably available control technology" (also denoted as RACT) means the lowest emission limit, which a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. It may require technology, which has been, applied to similar, but not necessarily identical, source categories.

SNCR ³	No	NA	SNCR not RACT
SCR ⁴	Yes	No \$13,444/ton	SCR not RACT
RSCR	Yes	No \$7,139/ton	RSCR not RACT

Notes:

1. Firing natural gas does not produce a LWA product of acceptable quality and the cost is 2.5 to 4.0 times higher than coal.
2. Not applied to LWA kilns in practice but was evaluated in the 2004 Stalite GH application.
3. Not demonstrated for LWA kilns. Injection required at temperatures of 1,600 to 2,000 F occurring somewhere in the rotating drum prohibiting installation. Supported by recent studies on cement kilns where it can be used in preheaters and calciners but not kilns.
4. Not applied to LWA kilns in practice but this control was evaluated in the 2004 Stalite GH application. SCR requires reheating of flue gas while achieving an 80% reduction in NOx.
5. Not applied to a LWA kiln in practice at this time but this control was evaluated in this application. The cost (dollar per ton) figure reflects the best or lowest cost.

The reader should refer to the application for further details regarding this analysis. The analysis appears to be thorough in addressing the technological feasibility and economic viability of applying additional controls for RACT. The most promising control if only technical feasibility and cost of control are considered would appear to be RSCR. The reader should refer to the detailed cost analysis (2/04/09) provided as part of this application.

Finally, this engineer reviewed information posted in the EPA's RACT/BACT/LAER Clearinghouse (RBLC) and did not find an applicable determination. In conclusion the DAQ believes the cost of control exceeds that required by RACT². We concur that RACT is no additional control for these sources.

III. Changes to Existing Title V Air Permit No. 03059T38

The following table provides a summary of changes.

Page	Section	Description of Change(s)
Cover letter	Cover letter	Change all dates, permit and application numbers and affected engineer. Copy the permit and review to EPA. Remove language referencing the last minor modification and include language indicating this is a significant modification.
Permit Title Page	Permit Title Page	Change all dates permit and application numbers.
6	Table of Emission Sources	Removed all footnotes associated with previous 502(B)10 changes and minor modifications as the minor modifications are now effective and the permit and review are going to notice and EPA. Updated remaining footnotes (numbers 1 and 2) not associated with the above.
7	2.1 A. Table	Included a new entry addressing NOx and RACT indicating RACT is no additional controls.
7	2.1 A.1.	From this point forward a changed all testing requirements citation from 2D .0501 to 2D .2601
15	2.1 A. 6.	Included new condition for 2D .1402 indicating RACT is no additional controls

IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility. Ms. Tonisha Dawson of the Mooresville Regional Office (MRO) last inspected Stalite GH on March 27, 2008. According to Ms. Dawson's inspection report, the facility appeared to operating in compliance with the applicable air quality regulations. The five-year compliance history is summarized in the inspection report as follows:

- A. The facility was issued a Notice of Violation and Recommendation for Enforcement (NOV/NRE) on April 11, 2005 for failure to submit a complete Title V application to operate the hydrated lime slurry injection

² Federal Register / Vol. 70. No. 228 / Tuesday, November 29, 2005 / Rules and Regulations / Pages 7164-7165

systems (ID Nos. CD-3b and CD-4b) on kilns 3 and 4 (ID Nos. ES-3 and ES-4). The facility was assessed and paid a penalty of \$5,412.

- B. The facility was issued an NOV on June 10, 2005 for failure to submit the required notice of construction and notice of startup reports for conveyor ES-25. No penalties were assessed for this violation.
- C. The facility was issued an NOV on September 13, 2005 for failure to maintain records of the visible emissions observations for conveyor ES-25. No penalties were assessed for this violation.

V. Summary of Existing Emission Sources and Control Devices Subject to RACT Review

The following table contains a summary of all RACT affected emission units and associated air pollution control devices and appurtenances:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Lightweight aggregate kilns and associated air pollution control equipment			
ES-1 and ES-2	two lightweight aggregate rotary expanding kilns (23 tons per hour capacity each) fired with coal or natural gas (52 million Btu per hour heat input rate each)	CD-1a CD-2a CD-1b CD-2b CD-2QDS	two hydrated lime slurry injection systems two bagfilters (7,313 square feet of filter area each) one packed bed scrubber (100 gallons per minute minimum liquid injection rate) installed on kiln ES-2
ES-3 and ES-4	two lightweight aggregate rotary expanding kilns (23 tons per hour capacity each) fired with coal or natural gas (52 million Btu per hour heat input rate each)	CD-3a CD-4a CD-3b CD-4b	two hydrated lime slurry injection systems two bagfilters (7,313 square feet of filter area each)
ES-5 PSD	lightweight aggregate rotary expanding kiln (23 tons per hour capacity) fired with coal or natural gas (52 million Btu per hour heat input rate)	CD-5a CD-5b	one hydrated lime slurry injection system bagfilter (7,313 square feet of filter area)
ES-6 PSD	lightweight aggregate rotary expanding kiln (23 tons per hour capacity) fired with coal or natural gas (52 million Btu per hour heat input rate)	CD-6a CD-6b	one hydrated lime slurry injection system bagfilter (7,313 square feet of filter area)
ES-17 PSD, NSPS Subpart UUU, and CAM	lightweight aggregate rotary expanding kiln (35 tons per hour capacity) fired with coal or natural gas (79.1 million Btu per hour heat input rate)	CD-17a CD-17b	one hydrated lime slurry injection system bagfilter (10,820 square feet of filter area)

VI. Emissions Unit (Source-by-Source) Evaluation for RACT

- A. Seven lightweight aggregate rotary expanding kilns rotary kiln (ID Nos. ES-1through ES-6 and ES-17)

15A NCAC 2D .1402: APPLICABILITY

For the purposes of this existing source RACT review the following regulations apply:

As per (f); The Rules in this Section apply to facilities with the potential to emit 100 tons or more of NOx per year in the following areas:

- (1) Cabarrus County
- (2) Gaston County
- (3) Lincoln County
- (4) Mecklenburg County
- (5) Rowan County
- (6) Union County
- (7) Davidson Township and Coddle Creek Township in Iredell County

Based on the review of Permit Application 8000003.08D the DAQ has determined that Reasonably Available Control Technology (RACT) for the emission sources above are no additional controls.

B. Remaining Emissions Units Evaluated Under RACT

Not required as there are no other sources of NOx at this facility.

VII. MACT Applicability

Not applicable

VIII. NSPS, PSD/NSR, RACT, CAM, 112(r) Applicability

NSPS

Not applicable

PSD/New Source Review (NSR) and Non Attainment New Source Review (NNSR)

Stalite GH is located in Rowan County. Rowan County is classified as being in non-attainment with the 8-hour ozone standard and is governed by NNSR rules under 15A NCAC 2D .0531. NOx and VOC are precursors to ozone. This source is considered a PSD/NSR major source, the facility was given a PSD/BACT emissions limits for some of the LWA kilns. Rowan County is located in the Metrolina Moderate Non Attainment Area. Stalite GH is considered a major source with potential emissions of NOx exceeding 100 tpy. Future modifications must be evaluated considering NNSR and RACT.

RACT

Since potential NOx emissions are greater than 100 tpy, the facility is subject to requirements under case-by-case Reasonably Available Control Technology (RACT). Stalite GH is an existing major source and must achieve final compliance by April 1, 2009.

DAQ received the application on July 30, 2007 addressing RACT applicability. Stalite GH proposes RACT is no additional control due to technical infeasibility and economic viability. Also, fuel switching was neither technically feasible nor economically viable. The DAQ concurs. Finally, there does not appear to be a control technology applied to similar, but not necessarily identical, source categories that are economically feasible.

CAM

Not applicable

112(r)

Not applicable

North Carolina Toxic Air Pollutants

Not applicable

IX. Other Regulatory Considerations

- Previous permits modifications were considered as 502(B)10 changes and minor modifications. The last minor permit was final November 22, 2008. All permit conditions, footnotes, etc. have been removed from this permit as public notice and EPA review are required.
- An application fee is not required for RACT applications.
- The appropriate number of application copies was received by DAQ on July 30, 2007.
- The application included the Reduction and Recycling Form (A4).
- A Professional Engineer's Seal is not required.
- A zoning consistency determination is not required for this application.
- Public notice is required for this significant modification under 15A NCAC 2Q .050(d)(2).
- IBEAM Emission Source Module (ESM) update was verified on XX XX, 2009.

X. Recommendations

This permit modification has been reviewed by DAQ Permits Section to determine compliance with all procedures and requirements. NCDAQ has determined that this facility appears to be complying or is expected to achieve compliance as specified in the permit with all applicable requirements. A draft was provided to the applicant and MRO on XX XX, 2009. The applicant responded on XX XX, 2009 with no comments. MRO responded with no comments. This significant modification of the title V permit is required to be taken to public notice and subjected to an EPA review. The 30-day public notice period and EPA's 45-day opportunity to comment was over on XX XX, 2009 therefore the permit was issued.

Issue Permit No. **03059T38**.