

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 042010 - 013 Project Number: 2008-12-027

Parent Company: Buzzi Unicem USA

Parent Company Address: 100 Broadhead Road Suite 230, Bethlehem, PA 18017

Installation Name: Lone Star Industries Inc. dba Buzzi Unicem USA

Installation Address: 2524 South Sprigg Street, Cape Girardeau, MO 63702-0520

Location Information: Cape Girardeau County, S18, T30N, R14E

Application for Authority to Construct was made for:  
The use of on-spec used oil as a fuel in the cement kiln. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

- 
- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

APR 20 2010

EFFECTIVE DATE

  
DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

**You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review.** In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

Page No.	3
Permit No.	
Project No.	2008-12-027

## SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

Lone Star Industries Inc. dba Buzzi Unicem USA  
Cape Girardeau County, S18, T30N, R14E

1. On-Spec Used Oil Usage Restriction
  - A. Lone Star Industries Inc. dba Buzzi Unicem USA shall not combust On-Spec Used Oil, as described in their application, in amounts greater than 278,462 gallons in any consecutive 12-month period. The On-Spec Used Oil will be used as an alternate fuel for coal or diesel in the kiln system.
  - B. Lone Star Industries Inc. dba Buzzi Unicem USA shall keep records of the amount of On-Spec Used Oil combusted in the kiln system. These records shall be maintained for not less than five (5) years and shall be made available immediately to any Missouri Department of Natural Resources' personnel upon request.
  - C. Lone Star Industries Inc. dba Buzzi Unicem USA shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the end of the month during which the records from Special Condition Number 1(B) indicate that the source exceeds the limitation of Special Conditions Number 1(A).
2. Chemical Analysis of On-Spec Used Oil Requirement
  - A. Lone Star Industries Inc. dba Buzzi Unicem USA shall verify the metals content of the On-Spec Used Oil by testing. Lone Star Industries Inc. dba Buzzi Unicem USA shall test those metals that contribute to the emissions of any Hazardous Air Pollutant (HAP).
    - i) The arsenic concentration of the On-Spec Used Oil cannot exceed 4.5 ppm;
    - ii) The total chromium concentration of the On-Spec Used Oil cannot exceed 10.0 ppm;
    - iii) The metal content of the On-Spec Used Oil cannot exceed an amount that will cause any remaining HAP emissions to be greater than the Screen Modeling Action Level (SMAL) for that HAP.

Page No.	4
Permit No.	
Project No.	2008-12-027

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- B. Lone Star Industries Inc. dba Buzzi Unicem USA shall keep records of the potential emissions of each HAP in Special Condition 2(A)(iii) based on the metal content testing for comparison to the SMAL in the attached *Table of Hazardous Air Pollutants and Screen Modeling Action Levels*. The SMAL values may require periodic updating to current values. Current HAPs SMAL values can be obtained from the Air Pollution Control Program's State Toxicologist.
- C. Lone Star Industries Inc. dba Buzzi Unicem USA shall verify sulfur content of the On-Spec Used Oil by testing. The sulfur content of the On-Spec Used Oil cannot exceed 2.6%.
- D. Testing shall be conducted on a sample of On-Spec Used Oil from each vendor. In addition, testing of oil from each vendor shall be conducted at least once every year while the On-Spec Used Oil is being used as an alternative fuel. Lone Star Industries Inc. dba Buzzi Unicem USA shall maintain a record of all test results for not less than five (5) years and shall make them available to any Missouri Department of Natural Resources' personnel upon request.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2008-12-027  
Installation ID Number: 031-0021  
Permit Number:

Lone Star Industries Inc. dba Buzzi Unicem USA      Complete: December 11, 2008  
2524 South Sprigg Street  
Cape Girardeau, MO 63702-0520

Parent Company:  
Buzzi Unicem USA  
100 Broadhead Road Suite 230  
Bethlehem, PA 18017  
Cape Girardeau County, S18, T30N, R14E

REVIEW SUMMARY

- Lone Star Industries Inc. dba Buzzi Unicem USA has applied for authority to use on-spec used oil as a fuel in the cement kiln.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. Lead and chromium VI are the HAPs of concern. All remaining HAPs will be emitted in amounts less than the Screen Modeling Action Level for each HAP.
- National Emission Standards for Hazardous Air Pollutants (NESHAPs) regulations, Subpart LLL, *From the Portland Cement Manufacturing Industry*, and Subpart EEE, *from Hazardous Waste Combustion*, applies to this installation.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. The emissions increase of all criteria air pollutants are below de minimis levels.
- This installation is located in Cape Girardeau County, an attainment area for all criteria air pollutants.
- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2], Number 3, Portland Cement Plants.
- Ambient air quality modeling was not performed on criteria pollutants since the emissions increase of the application are below de minimis levels. However, ambient air quality modeling was performed for lead and chromium VI.

- Emissions testing are not required for the project.
- Revision to the installation's Part 70 Operating Permit application is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

Lone Star Industries, Inc. dba Buzzi Unicem USA – Cape Girardeau (Buzzi) owns and operates a cement manufacturing installation in Cape Girardeau County. This cement manufacturing plant is an existing major source of air emissions. This facility was issued a Part 70 Operating Permit (OP2001-029) on April 19, 2001. The applicant submitted a renewal application for the Part 70 permit (Project No. 2005-10-052) and the Part 70 Operating Permit Renewal was issued on March 24, 2010. The following construction permits have been issued to Buzzi from the Air Pollution Control Program.

Table 1: Previously Issued Construction Permits

Permit Number	Description
0483-009..011	Equipment modification
0691-010	Tires as fuel substitute
0392-001	Liquid hazardous waste
0693-009	Amend permit to identify filter pot cleaning
0496-007	Add three (3) clinker silos
0697-004	Replace crusher
1197-012	Installation of spray tower and baghouse and replacement of the raw mill fan, the clinker cooler fans and grade, belt KB-1200, belt R-3700 motor, raw material elevator KB-1600, and the raw mill separator
1197-012A	Amendment to Permit No. 1197-012
102000-016	Addition of a new quarry to supply raw material for the kiln
042002-002	Installation of a synthetic gypsum process at the existing Cape Girardeau cement plant
0496-007A	Amendment to Permit No. 0496-007
102000-016	Permit extension granted
072003-007	Modification to the existing blended synthetic gypsum process
102000-016	Second permit extension granted
092004-007	Temporary Permit for possible usage of petroleum coke to replace a portion of the coal currently being combusted in cement kiln
062005-005	Temporary Permit to evaluate the introduction of chipped tire-derived fuel (TDF) into the calciner as a fuel
092004-007A	Extension of Temporary Permit 092004-007
092005-014	Temporary permit for a combustion improvement project
102005-018	Installation of a hopper, belt conveyor, and storage bin with a loadout spout to offload raw materials from barges to haul trucks
042006-002	Section (5) permit for the installation of a feeder system
092005-014A	Extension of Temporary Permit 092005-014
112006-012	Section (5) permit for oxygen injection

## PROJECT DESCRIPTION

Lone Star Industries, Inc. dba Buzzi Unicem USA (Buzzi) is requesting the authority to use on-spec used oil as an alternate fuel in the cement kiln at the cement manufacturing plant in Cape Girardeau, Missouri. Heating value of the on-spec used oil is 14,750 Btu/lb. The annual amount of diesel used (200,000 gallons) will be replaced with approximately 278,460 gallons of on-spec used oil. Buzzi will burn this material in the calciner using existing equipment at a proposed rate not to exceed 522 gallons per hour.

Buzzi was issued Permit Number 0691-010 for the authority to burn tires and other “alternate fuels” in their rotary kiln. The alternate fuels listed in the application include sawdust, cotton waste (cotton gin waste), rice hulls, railroad ties (waste ties shredded), rubber (waste shredded rubber items), sterifuel (hospital waste that has been sterilized and shredded), waste oil, and ink. Although the Air Pollution Control Program believes the use of on-spec used oil listed in the application can be considered one of the alternative fuels listed in Permit Number 0691-010, in order to utilize the on-spec used oil, Buzzi will need to upgrade the existing preheat burner feed pumps to provide sufficient flow rate. Therefore, the new alternative fuel cannot be approved under the previous construction permit. In addition, since a modification of the process is occurring, a new construction permit is being issued to authorize the installation of the new feed pumps.

## EMISSIONS/CONTROLS EVALUATION

To determine if the proposed modification to the approved fuel would result in a significant emissions increase, projected actual emissions of the new equipment as defined in 40 CFR 52.21(b)(41) were evaluated for the use in the actual-to-projected-actual applicability test as outlined in 40 CFR 52.21(a)(2)(iv)(c). This applicability test, however, is not applicable to Hazardous Air Pollutant (HAP) emissions.

Buzzi proposes to burn approximately 278,460 gallons of on-spec used oil at a rate not to exceed 522 gallons per hour. For purposes of HAP emissions, a special condition can be found in this permit limiting the amount of on-spec used oil that can be burned annually. Therefore, the maximum future actual emissions will be the combustion emissions based on coal combustion with the limited burning capacity of on-spec used oil. It should be noted that the maximum future actual emissions and the potential emissions are same due to the oil combustion limitation. Therefore, although recordkeeping is required for compliance with the limit, it is not necessary for tracking projected actual emissions under 40 CFR 52.21(b)(41).

In addition, the exclusion of emissions attributed to demand growth as stated in 40 CFR 52.21(b)(41)(ii)(c) has been utilized in calculating the emissions increase from the project. Based on the exclusion, emissions that the existing unit could have accommodated prior to the project, including any increased utilization due to product demand growth, can be excluded. To simplify the calculations, the increase in emissions is evaluated in terms of coal and used oil combustion emissions.

In this case, the amount of emissions that the existing equipment could have accommodated prior to the modification is the same as the potential emissions of the cement kiln combusting coal. Buzzi currently operates close to capacity combusting coal and other alternative fuels. Although Buzzi is able to combust coal exclusively at maximum capacity, the use of alternative fuels reduces fuel costs. Therefore, emissions attributed to the original coal combustion capacity of the cement kiln can be excluded from the maximum future actual emissions in determining if the increase in emissions triggers major review. For ease of calculations, the increase is determined by the equations outlined in Figure 1.

$$\text{Projected Actual Emissions (PAE)} = \text{maximum future actual} - \text{demand growth}$$

$$\text{Projected Actual Emissions} = (\text{coal}_{\text{baseline}} + \text{coal}_{\text{increase}} \text{ combustion} + \text{used oil combustion}) - (\text{coal}_{\text{increase}} \text{ combustion})$$

$$\text{Projected Actual Emissions} = \text{coal}_{\text{baseline}} \text{ combustion} + \text{used oil combustion}$$

$$\text{Baseline Actual Emissions (BAE)} = \text{coal}_{\text{baseline}} \text{ combustion}$$

$$\text{Emissions Increase} = \text{PAE} - \text{BAE} = \text{used oil combustion}$$

Figure 1: Equation for Determining Emissions Increase

The emission factors used in this analysis were obtained from information submitted by the applicant on the characteristics of the on-spec used oil. The ash content of the used oil is greater than diesel making the possibility of particulate matter emission to be greater. However, since the amount of used oil that can be combusted is limited, these emissions are not expected to increase more than the de minimis levels. To determine the SOx emissions from the used oil, the emission factor found in Table 1.11-2 was used with the sulfur content of the used oil being limited to less than 2.6%. Baseline actual emissions (BAE) were taken from the installation's 2007 Emissions Inventory Questionnaire (EIQ). The following table provides an emissions summary for this project.

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2007 EIQ)	PAE – BAE Emissions* (tpy)	Does PAE – BAE exceed de minimis threshold?
PM <sub>10</sub>	15.0	Major	590.42	3.97	No
SOx	40.0	Major	18.15	38.7	No
NOx	40.0	Major	1224.31	2.23	No
VOC	40.0	Major	20.40	0.03	No
CO	100.0	Major	8786.62	0.29	No
HAPs	10.0/25.0	Major	28.85	5.04	No

\*PAE – BAE Emissions equal the used oil combustion emissions.

## PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. The emissions increase of all criteria air pollutants are below de minimis levels.

## APPLICABLE REQUIREMENTS

Lone Star Industries Inc. dba Buzzi Unicem USA shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

### SPECIFIC REQUIREMENTS

- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for the Portland Cement Manufacturing Industry*, 40 CFR Part 63, Subpart LLL
- *Emission Standards for Hazardous Air Pollutants*, 10 CSR 10-6.080 – *National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Hazardous Waste Combustion*, 40 CFR Part 61, Subpart EEE

## AMBIENT AIR QUALITY IMPACT ANALYSIS

Lead (CAS# 7439-92-1) and chromium (VI) compounds are regulated Hazardous Air Pollutants (HAPs) listed in the application with potential emissions that will exceed their respective Screen Modeling Action Levels (SMAL). Therefore, a screen analysis was performed on these pollutants.

The applicant has taken a concentration limit on arsenic (CAS# 7440-38-2) and total chromium (CAS #7440-47-3) in the used oil such that the SMAL will not be exceeded. Therefore an air quality analysis was not conducted on arsenic. Table 2 compares the modeled impacts to the Risk Assessment Levels (RALs) of each HAP.

Table 2: Comparison of ambient impact to RALs of HAPs related to this project

Pollutant	Concentration (ppm)	Modeled Impact ( $\mu\text{g}/\text{m}^3$ )	RAL ( $\mu\text{g}/\text{m}^3$ )	Time Period
Lead	50	0.047	2	8-hour
		0.027	0.357	24-hour
		0.0054	0.7	Annual
Chromium VI	5	0.0027	0.003	24-hour
		0.0005	0.001	Annual

The table indicates that the ambient impacts for lead and chromium VI will not exceed the RALs for these HAPs. This is based on the concentration of the lead and chromium listed in the application and in Table 2. For chromium, it was assumed that 50% of the chromium would form hexavalent chromium emissions. A condition has been added to this permit that requires metals concentration testing be conducted on the used oil. This will ensure that other HAPs will not exceed their respective SMALs.

#### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

\_\_\_\_\_  
Emily Wilbur  
Environmental Engineer

\_\_\_\_\_  
Date

#### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated December 1, 2008, received December 8, 2008, designating Buzzi Unicem USA as the owner and operator of the installation.
- On-Spec Used Oil analysis information.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition
- Southeast Regional Office Site Survey, dated December 30, 2008.
- Correspondences with applicant via email on September 17, 2009, November 17, 2009 and December 3, 2009.

Mr. Paul Schell  
Environmental Engineer  
Lone Star Industries Inc. dba Buzzi Unicem USA  
P.O. Box 520  
Cape Girardeau, MO 63702-0520

RE: New Source Review Permit - Project Number: 2008-12-027

Dear Mr. Schell:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files.

Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

Please notify the department's Hazardous Waste Program of this activity to verify what action is required under your Missouri Hazardous Waste Management Facility Permit.

If you have any questions regarding this permit, please do not hesitate to contact Emily Wilbur, at the Departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale  
New Source Review Unit Chief

KBH:ewl

Enclosures

c: Ms. Darleen Groner, Hazardous Waste Program  
Southeast Regional Office  
PAMS File: 2008-12-027