R-13 PERMIT APPLICATION

America's Best Block, Inc. > Keyser, WV Plant

Prepared for

America's Best Block
20000 Tanbark Way
Brinklow, MD 20862
(240) 855-4055

March 2017

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1.1. FACILITY AND PROJECT DESCRIPTION

America's Best Block Incorporated (America's Best Block) is proposing to construct an autoclaved aerated concrete (AAC) block manufacturing facility at 780 Waxler Road, Keyser, Mineral County, WV (the America's Best Block facility). The America's Best Block facility will include sources or air emissions, therefore will require a pre-construction permit under West Virginia Code of State Regulations, Title 45, Section 13 (45 CSR 13, or R-13). This application includes all the necessary information required to request an R-13 permit for the proposed site.

The America's Best Block facility will produce AAC block via a process that utilizes sand, fly ash, lime, cement, gypsum and aluminum power or paste as raw materials. The sand, fly ash and aluminum powder are mixed with water prior to the production process, and are delivered in slurry form to the raw material mixing point. The lime, cement and gypsum are added to the mixing point in powder form. Once mixed, the raw materials are added to a mold. The mold is then transported to an interior pre-curing room. Following the pre-curing process, the block is cut into pre-specified sizes before entering an autoclave for final steaming and hardening. The finished block is then transported to be packaged and stored onsite before eventually being shipped. A certain amount of waste material from the finished block will be collected, crushed and reintroduced as a raw material to the process.

The primary sources of air emissions at the America's Best Block facility will be the material handling equipment associated with transferring, mixing and storing of the raw materials and finished product. Several of these sources will be equipped with control devices to reduce particulate matter emissions generated by material handling. PM emissions will also be generated by truck traffic at the site on both paved and unpaved haul roads. In addition, the site will have a natural gas-fired boiler for the production of steam to heat the block, and an emergency generator. A summary of the proposed sources and their associated control devices is provided in Table 1-1.

Table 1-1. Proposed Emission Units

Emission Unit ID	Material Handled	Emission Unit Description	Control Device
S-S-Sand	Sand	Sand Stockpile	None
S-1.4.1	Sand	Sand Feeding Hopper	None
S-1.4.4	Sand	Sand Belt Conveyor	None
S-P-Waste	Waste Material	Waste Product Pile	None
S-1.2.2	Waste Material	Waste Jaw Crusher	DC 1.2.5
S-1.2.3a	Waste Material	Waste Belt Conveyor 1	DC 1.2.5
S-1.2.4	Waste Material	Waste Roll Crushing Mill	None

Emission Unit ID	Material Handled	Emission Unit Description	Control Device
S-1.2.8	Waste Material	Waste Silo	Dust collector (DC) 1.1.8e
S-1.2.3b	Waste Material	Waste Belt Conveyor 2	None
S-1.4.7	Sand/Waste Material	Ball Mill	None
S-1.1.3a	Cement	Cement silo 1	DC 1.1.8c
S-1.1.3b	Cement	Cement Silo 2	DC 1.1.8d
S-1.1.2	Gypsum	Gypsum silo	DC 1.1.8b
S-1.1.1	Lime	Lime silo	DC 1.1.8a
S-1.3.1	Fly Ash	Fly Ash Powder Silo	DC 1.3.2
S-DH-Ash	Fly Ash	Fly ash discharge hopper	DC 1.3.7
S-2.1.14	Multiple	Pouring mixer	None
S-Boiler	N/A	Natural gas-fired boiler	None
S-ENGEN	N/A	Emergency generator	None

In addition to the sources listed in Table 1-1, the America's Best Block facility will have several pieces of equipment that will process material as a water saturated slurry, or will be fully enclosed. PM emissions from these sources are expected to be negligible, and therefore do not require inclusion in the requested permit. However, a summary of these units have been provided in Table 1-2 for informational purposes.

Table 1-2. Sources with Negligible Expected Air Emissions

Emission Unit ID	Material Handled	Emission Unit Description	
S-1.2.7	Waste Material	Waste Bucket Elevator	Source fully enclosed
S-1.4.10	Waste Material/Sand	Sand and Waste Mixer	Processed as a saturated slurry
S-1.1.5c	Cement	Concrete Screw Conveyor 1	Source fully enclosed
S-1.1.5d	Cement	Concrete Screw Conveyor 2	Source fully enclosed
S-2.1.3	Cement	Auto-dosing scale for Concrete	Source fully enclosed
S-2.1.5b	Cement	Concrete Screw Conveyor 3	Source fully enclosed
S-1.1.5b	Gypsum	Gypsum Screw Conveyor	Source fully enclosed
S-2.1.1	Gypsum/Lime	Auto-dosing scale for Lime and Gypsum	Source fully enclosed
S-1.1.5a	Lime	Lime Screw Conveyor	Source fully enclosed

Emission Unit ID	Material Handled	Emission Unit Description	
S-1.3.6	Fly Ash	Fly Ash Metering Scale with Spiral Governor	Source fully enclosed
S-1.3.9	Fly ash	Fly Ash Slurry Mixer	Processed as a saturated slurry
NA	Aluminum	Aluminum mixer 1	Processed as a saturated slurry
NA	Aluminum	Aluminum mixer 2	Processed as a saturated slurry
NA	Multiple	Pouring mixer	Source fully enclosed
NA	AAC Block	Autoclave	No emissions generated by process

1.2. R-13 APPLICATION ORGANIZATION

The following information is included as part of this application submittal:

- Section 1 includes the application introduction;
- Section 2 provides sample emissions calculations;
- Section 3 contains the required R-13 permit application form;

- Attachment A includes America's Best Block's Certificate of Authority;
- Attachment B includes a map of the facility's location;
- Attachment C includes the planned schedule for installation and start-up of the proposed plant;
- Attachment D includes a regulatory discussion;
- Attachment E includes a plot plan of the site;
- Attachment F includes a detailed process flow diagram of the proposed plant;
- Attachment G includes a description of the process for the proposed project;
- Attachment H includes a Material Safety Data Sheet for the materials to be processed;
- Attachment I includes the emissions unit table;
- Attachment J includes the emission points data summary sheet;
- Attachment K includes the fugitive emissions data summary sheet;
- Attachment L includes the emissions unit data sheets;
- Attachment M includes the air pollution control device sheets;
- Attachment N includes the supporting emissions calculations; and
- Attachment O includes the proposed monitoring, recordkeeping, reporting and testing plans for the proposed new equipment.

2.1. MATERIAL HANDLING SOURCES

The proposed emission sources at the America's Best Block facility include sources that will perform various material handling processes, including the transfer, crushing and storage of the various raw materials. The only pollutants these sources will emit to the air are particulate matter (PM), particulate matter less than 10 microns (PM_{10}) and particulate matter less than 2.5 microns ($PM_{2.5}$). Sample air emissions calculations are provided below. Detailed supporting calculations are also provided in Attachment N.

Emissions from several of the proposed sources will be controlled via baghouses that will operate continuously when the new equipment is in operation. Emissions from each of these baghouses were calculated using an estimated outlet grain loading in grains per dry standard cubic feet (gr/dscf), along with the rated flowrate of gas through the baghouse in dry standard cubic feet per minute (dscfm). For the purpose of the calculations, it was assumed that each process and baghouse will operate for 8,760 hours per year. The equation below was used to calculate the emission rate in tons per year (tpy) from each baghouse.

$$PM\ Emission\ rate\ (tpy) = PM\ Outlet\ grain\ loading\ \left(\frac{gr}{dscf}\right) x\ Flowrate\ (dscfm)\ x\ \left(\frac{60\ min}{1\ hour}\right) x\ \left(\frac{1\ lb}{7{,}000\ gr}\right) x\ \left(\frac{8{,}760\ hours}{1\ year}\right) x\ \left(\frac{1\ ton}{2{,}000\ lbs}\right)$$

Similarly, the equation used to calculate the emission rate in pounds per hour (pph) is shown below:

$$PM\ Emission\ rate\ (pph) = PM\ Outlet\ grain\ loading\ \left(\frac{gr}{dscf}\right) x\ Flowrate\ (dscfm)\ x\ \left(\frac{60\ min}{1\ hour}\right) x\ \left(\frac{1\ lb}{7{,}000\ gr}\right)$$

In addition, minor amounts of fugitive emissions are expected from the material storage piles and possible uncontrolled sources of emissions. Fugitive emissions from these sources were calculated using each source's throughput of material and emission factors from U.S. EPA, AP-42 Section 11.19.2, Section 11.6, Section 11.12 and Section 13.2.4. Control factors were estimated based on the type of enclosure for these units. The equation below was used to estimate fugitive emissions in tpy.

$$Fugitive\ PM\ emission\ rate\ (tpy) = Control\ factor\ (\%)\ x\ Material\ throughput\ \left(\frac{tons}{year}\right)\ x\ Emission\ factor\ \left(\frac{lbs\ PM}{ton}\right)\ x\ \left(\frac{1\ ton}{2{,}000\ lbs}\right)$$

Similarly, the equation used to calculate the fugitive emission rate in pounds per hour (pph) is shown below:

$$Fugitive\ PM\ emission\ rate\ (pph) = Control\ factor\ (\%)\ x\ Material\ throughput\ \left(\frac{tons}{year}\right)\ x\ Emission\ factor\ \left(\frac{lbs\ PM}{ton}\right)\ x\ \frac{1}{Hours\ per\ year}\ \left(\frac{year}{hours}\right)$$

2.2. FUEL BURNING SOURCES

2.2.1. Boiler

American's Best Block is also proposing to install and operate a 15.7 MMBtu/hr natural gas fired boiler at the proposed facility for the production of steam to heat the concrete block in the production process. Potential emissions of criteria pollutants and hazardous air pollutants (HAPs) were calculated using U.S. EPA's AP-42 factors for natural gas external combustion from Section 1.4. These calculations assume an AP-42 default heat content of natural gas of 1,020 BTU/scf. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.

2.2.2. Emergency Generator

The America's Best Block facility will include a 2,220 HP dieselfuel-fired emergency generator. The proposed engine is a Cummins Model QSK50-G5 NR2. Potential emissions of oxides of nitrogen (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2) and particulate matter (PM) are calculated using manufacturer vendor guarantees. HAPs are calculated using U.S. EPA's AP-42 factors for diesel fired engines from Chapter 3.3. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.

3. R-13 APPLICATION FORM

The WVDEP permit application forms contained in this application include all applicable R-13 application forms including the required attachments.

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
America's Best Block, Inc.

2. Federal Employer ID No. ***(FEIN):***
8 0 0 7 4 0 1 0 1

3. Name of facility *(if different from above):*
America's Best Block

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
20000 Tanbark Way
Brinklow, MD 20862

5B. Facility's present physical address:
780 Waxler Road
Keyser, WV 26726

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: Applicant owns the site.
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Autoclave Aerated Concrete (AAC) block manufacturing

10. North American Industry Classification System **(NAICS)** code for the facility:
327331

11A. DAQ Plant ID No. (for existing facilities only):
–

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

From Charleston, WV: Take I-77 North to I-79. Take I-79 North toward Clarksburg, WV. At exit 148, take I-68 East toward Cumberland, MD. At exit 40, take ramp right and follow signs for Vocke Rd/Campground Rd. After 0.2 mile turn right on to MD-658 South. After 0.4 mile turn left onto MD-53 S. After 2.7 miles turn right onto US-220. Bear right onto WV-46 East. Turn right onto WV-46 East. Take a left onto Waxler Road/CR-8. The facility will be on the right.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
780 Waxler Road	Keyser, WV	Mineral County
12.E. UTM Northing (KM): 4368402.84	12F. UTM Easting (KM): 676281.62	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
America's Best Block, LLC has developed an Autoclave Aerated Concrete block which is manufactured primarily of fly ash, lime, cement, gypsum, and aluminum. The proposed AAC block manufacturing plant will be the first of its kind in the United States.

14A. Provide the date of anticipated installation or change: 05/01/2017 – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: 12/01/2017

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 22.5 Days Per Week 6 Weeks Per Year43

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☒ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☒ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☐ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify Emergency Generator and Boiler

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☒ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE M. Y. Hassanein *(Please use blue ink)* DATE: 3/23/2017 *(Please use blue ink)*

35B. Printed name of signee: Magdi Hassanein		35C. Title: Chairman
35D. E-mail: adg_ksi@hotmail.com	36E. Phone: 240-855-4055	36F. FAX:
36A. Printed name of contact person (if different from above):		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

☒ **Attachment A: Business Certificate**
☒ **Attachment B: Map(s)**
☒ **Attachment C: Installation and Start Up Schedule**
☒ **Attachment D: Regulatory Discussion**
☒ **Attachment E: Plot Plan**
☒ **Attachment F: Detailed Process Flow Diagram(s)**
☒ **Attachment G: Process Description**
☒ **Attachment H: Material Safety Data Sheets (MSDS)**
☒ **Attachment I: Emission Units Table**
☒ **Attachment J: Emission Points Data Summary Sheet**
☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
☒ **Attachment L: Emissions Unit Data Sheet(s)**
☒ **Attachment M: Air Pollution Control Device Sheet(s)**
☒ **Attachment N: Supporting Emissions Calculations**
☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
☒ **Attachment P: Public Notice**
☐ **Attachment Q: Business Confidential Claims**
☐ **Attachment R: Authority Forms**
☐ **Attachment S: Title V Permit Revision Information**
☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
☐ ***For Title V Administrative Amendments:***
  ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
☐ ***For Title V Minor Modifications:***
  ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A: CERTIFICATE OF AUTHORITY

State of West Virginia

Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

AMERICA'S BEST BLOCK INC.

Control Number: 9ACAR

has filed its application for "Certificate of Incorporation" in my office according to the provisions of the West Virginia Code. I hereby declare the organization to be registered as a corporation from its effective date of November 19, 2015, until a certificate of dissolution has been filed with Secretary of State.

Therefore, I hereby issue this

CERTIFICATE OF INCORPORATION

Given under my hand and the Great Seal of the State of West Virginia on this day of November 19, 2015

Natalie E Tennant

Secretary of State

ATTACHMENT B: MAP

ATTACHMENT B – AREA MAP

Figure 1 - Map Showing America's Best Block, LLC Facility

Directions: From WV-46 E/Armstrong Street, turn left onto Waxler Road. 780 Waxler Road will be on the right.

ATTACHMENT C: STARTUP AND INSTALLATION SCHEDULE

ATTACHMENT C

Schedule of Installation and Start-Up

Unit	Installation Schedule	Startup Schedule
America's Best Block Facility	May 2017	December 2017

ATTACHMENT D: REGULATORY DISCUSSION

ATTACHMENT D – REGULATORY DISCUSSION

This section documents the applicability determinations made for Federal and State air quality regulations. The monitoring, recordkeeping, reporting and testing plan is presented in Attachment O to this application. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- Prevention of Significant Deterioration (PSD);
- Non-Attainment New Source Review (NNSR);
- Title V Permitting;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP); and
- West Virginia State Implementation Plan (SIP) Regulations.

This review is presented to supplement and/or add clarification to the information provided in the WVDEP R13 permit application forms. In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the proposed units at the new America's Best Block facility. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the proposed America's Best Block facility. Regulations that are categorically non-applicable are not discussed.

Prevention of Significant Deterioration (PSD)/Non-Attainment New Source Review (NNSR) Classification

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD) and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NNSR). PSD and NNSR regulations apply when a new major source is constructed or an existing major source makes a change, such as installing new equipment or modifying existing equipment, resulting in a significant increase in emissions. The America's Best Block facility is located in Mineral County, West Virginia, which is classified as attainment for all pollutants and therefore is regulated under PSD. The America's Best Block facility is not a major source with respect to the PSD program since emissions of all NSR regulated pollutants are below 250 tons per year.

Title V Operating Permit Program

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia Code of State Regulations (CSR) 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP, and 100 tpy of all other regulated pollutants. The America's Best Block facility potential to emit does not exceed the West Virginia Title V operating permit program major source thresholds. Therefore, the America's Best Block facility is not a major source with respect to the Title V operating permit program.

New Source Performance Standards

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS

Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the proposed project at the America's Best Block facility.

NSPS Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants

Subpart OOO applies to affected facilities in fixed or portable nonmetallic mineral processing plants that commenced construction, reconstruction or modification after August 31, 1983. The affected facilities under this Subpart are each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station. Subpart OOO establishes particulate matter (PM) emissions standards for affected facilities that use capture systems to transport PM to a control device and fugitive opacity standards for affected facilities that do not use capture systems. Subpart OOO also includes monitoring and testing requirements for affected facilities.

America's Best Block uses several raw materials to manufacture AAC block, including cement, lime, fly ash, gypsum and sand. In addition, waste material leftover from the finished product is recycled back as a raw material to the process. NSPS OOO applies only to nonmetallic mineral processing plants, which are defined in 40 CFR 60.671 as:

> *any combination of equipment that is used to crush or grind any nonmetallic mineral wherever located, including lime plants, power plants, steel mills, asphalt concrete plants, portland cement plants, or any other facility processing nonmetallic minerals except as provided in §60.670 (b) and (c).*

The only materials processed at the America's Best Block facility that fall into the category of nonmetallic mineral as defined in 40 CFR 60.671 are sand and gypsum. However, the U.S. Environmental Protection Agency (EPA) has provided guidance that concrete reasonably meets the definition of nonmetallic mineral as well. Therefore, the sand, gypsum and waste AAC material handling operations that meet the definition of an affected facility under NSPS OOO will be subject to the emissions standards, monitoring and testing requirements under the rule. Table D-1 summarizes the equipment subject to NSPS OOO.

Table D-1. NSPS OOO Sources

Emission Unit ID	Emission Unit Description	Control Device
S-1.2.2	Waste Jaw Crusher	DC 1.2.5
S-1.2.3a	Waste Belt Conveyor 1	DC 1.2.5
S-1.2.4	Waste Roll Crushing Mill	--
S-1.2.7	Waste Bucket Elevator	--
S-1.2.8	Waste Silo	DC 1.1.8e
S-1.2.3b	Waste Belt Conveyor 2	--
S-1.1.2	Gypsum silo	DC 1.1.8b
S-1.4.4	Sand Belt Conveyor	--
S-1.4.7	Ball Mill	--

A detailed description of the applicable monitoring, testing, recordkeeping and reporting requirements for each piece of proposed equipment are included in the application as Attachment O.

NSPS IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII applies to stationary, compression ignition (CI) internal combustion engines (ICE) manufactured after specified dates depending on engine size and type. The proposed emergency generator engine at the America's Best Block facility will be subject to the requirements of Subpart IIII.

The emergency generator will be ordered after July 11, 2005 and is EPA certified for model year 2016 engines. The engine is not a fire pump and will have a model year later than 2007, a maximum power rating of greater than 50 horsepower (HP), and a cylinder displacement less than 30 liters per cylinder. As such, the engine will be subject to the emission limitations for engines in 40 CFR 60.4205(b) and 40 CFR 60.4202(a)(2). In accordance with 40 CFR 60.4211(c), America's Best Block will comply by purchasing an engine certified to the applicable emission standards. The engine will be installed and configured according to the manufacturer's emission-related specifications.

Also, per 40 CFR 60.4207(b), America's Best Block will use diesel with a sulfur content of no more than 15 parts per million (ppm) and either a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent. No recordkeeping or reporting will be required for the emergency generator; additionally, no initial notification under 40 CFR 60.7(a)(1) is required.[1]

NSPS Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

NSPS Dc establishes emissions levels for steam generating units not covered under NSPS Subpart Da or Db which are capable of producing at least 2.9 MW (10 MMBtu/hr) of heat input, but less than 29 MW (100 MMBtu/hr) of heat input and were constructed, modified, or reconstructed after June 9, 1989. Since the boiler is new and will have a heat input capacity of 15.7 MMBtu/hr, it will be subject to NSPS Dc. Because the unit will use natural gas exclusively, it is not subject to any SO_2 or PM limits within this subpart. America's Best Block will maintain records of the amount of fuel used in each calendar month.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. The America's Best Block facility is an area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

NESHAP ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

NESHAP ZZZZ applies to reciprocating internal combustion engines (RICE) located at a major or area source of HAP emissions. The affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions. Thus, emergency generator at the America's Best Block facility is a new affected

[1] 40 CFR 60.4214(b)

source under Subpart ZZZZ. In accordance with 40 CFR 63.6590(c), compliance with NESHAP Subpart ZZZZ is met by complying with the NSPS Subpart IIII requirements. No other requirements will apply to the proposed engine under NESHAP Subpart ZZZZ.

NESHAP JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

NESHAP JJJJJJ (commonly referred to as the Area Source Boiler MACT) applies to industrial, commercial, and institutional boilers and process heaters located at area sources of HAPs. The boiler is potentially subject to the Area Source Boiler MACT. However, this unit burns only natural gas. Natural gas units are exempt from the rule, per 40 CFR 63.11195(e). As such, this unit is not subject to the Area Source Boiler MACT.

West Virginia SIP Regulations

The America's Best Block facility is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

> *No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.*

The America's Best Block facility is generally subject to this requirement. However, due to the nature of the proposed processes, production of objectionable odor is unlikely.

45 CSR 7: To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations

The America's Best Block facility will be subject to the requirements of 45 CSR 7, which include standards for opacity and PM emissions for manufacturing processes. In addition to the emissions limitations, 45 CSR 7 establishes requirements for fugitive particulate matter control, as specified in 45 CSR 7-5.1:

> *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.*

Further requirements are included in 45 CSR 7-5.2:

> *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.*

America's Best Block will comply with the requirements of 45 CSR 7 for all operations at the facility.

45 CSR 13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation

45 CSR 13 provides the procedures for obtaining a permit for several types of actions, including construction of a new stationary source. The America's Best Block facility will be a new non-major source in West Virginia. This permit application is being submitted for the proposed project in accordance with 45 CSR 13.

45 CSR 16: Standards of Performance for New Stationary Sources

45 CSR 16-1 incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources set forth in 40 CPR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60, the America's Best Block facility will be complying with 45 CSR 16. NSPS applicability was discussed previously.

45 CSR 17: To Prevent and Control Particulate Matter Air Pollution From Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

Requirements for the prevention and control of fugitive particulate matter emissions from materials handling, preparation, storage and other sources are provided in 45 CSR 17. However, sources subject to 45 CSR 7 are exempt from the requirements of 45 CSR 17, per 45 CSR 17-6. The proposed America's Best Block facility is subject to 45 CSR 7, and is therefore exempt from 45 CSR 17.

45 CSR 27: To Prevent and Control the Emissions of Toxic Air Pollutants

45 CSR 27 sets the requirements for the use of best available technology to prevent and control the discharge of toxic air pollutants. Due to the nature of material handled in the proposed emission sources, this regulation will not apply.

45 CSR 34: Emissions Standards for Hazardous Air Pollutants

45 CSR 34-1 incorporates the federal Clean Air Act (CAA) national emissions standards for hazardous air pollutants (NESHAPs) as set forth in 40 CPR Parts 61 and 63 by reference. NESHAP applicability was discussed previously. The America's Best Block facility will not be subject to any NESHAP Subpart; therefore, it is not subject to 45 CSR 34.

Non-Applicability of Other SIP Rules

A thorough examination of the West Virginia SIP rules with respect to applicability at America's Best Block reveals many SIP regulations that do not apply or impose additional requirements on operations. Such SIP rules include those specific to a particular type of industrial operation that is categorically not applicable to the America's Best Block facility.

ATTACHMENT E: PLOT PLAN

PROPOSED TOPSOIL STOCKPILE

PROPOSED FINISHED PRODUCT STORAGE YARD (OPTIONAL STONE OR CONCRETE. OWNERS DISCRETION)

PROPOSED CHAIN LINK FENCE

PROPOSED PAD FOR CONDENSATE POOL

PROPOSED ROUTE FOR CONDENSATE POOL PAD

PROPOSED RETAINING WALL

PROPOSED DOUBLE DRIVE GATE

PROPOSED PAVEMENT SECTION

PROPOSED SAND STORAGE YARD

TIE PROPOSED WIDENED ACCESS ROAD INTO EXISTING ACCESS ROAD MAINTAINING EXISTING 20' ROW

PROPOSED AMERICA'S BEST BLOCK FACTORY FFE = 833.0

1/2 MILE TO WASTE SITE

EXISTING UTILITY POLE TO BE RELOCATED (BY OTHERS)

EXISTING ACCESS ROAD TO BE WIDENED TO 24'

PROPOSED SCALE LOCATION

PROPOSED ENTRANCE TO FACTORY

PROPOSED SWM FACILITY #2

PROPOSED GUARDRAIL (TYP)

PROPOSED CURB (TYP)

WIDEN EXISTING ENTRANCE FOR TRUCK TURNING MOVEMENTS

FUTURE OFFICE BUILDING PAD 0.72 ACRES

PROPOSED GRAVEL SECTION

PROPOSED SCALE LOCATION

ENTRANCE/EXIT FOR FUTURE OFFICE BUILDING PAD

PROPOSED SWM FACILITY #1

50 0 50 100

LAYOUT TAB: 02-SITE PLAN-P2
CAD FILE: R:\030-2968-KEYSER INDUSTRIAL PARK-AMERICAS BEST BLOCK-\Drawing\2968-SITE PLAN-FINAL-CMK WALL PROFILE.dwg
PLOT DATE/TIME: 2/28/2017 7:08 AM

NO.	BY	DATE	DESCRIPTION
1	ZLA	11/10/16	PAVEMENT AREAS, SITE LAYOUT, WATER LINES, & CONDENSATE TANK LOCATION
2	ZLA	02/27/17	BUILDING & WALL RELOCATION

Changzhou Success Building Material Machinery Co., Ltd.

America's Best Block Inc.
Fly Ash AAC Block Production

THRASHER
THE THRASHER GROUP INC.
CIVIL • ENVIRONMENTAL • CONSULTING • FIELD SERVICES
600 WHITE OAKS BOULEVARD, BRIDGEPORT, WV 26330
PHONE (304) 624-4108 • FAX (304) 624-7831

PHASE No.

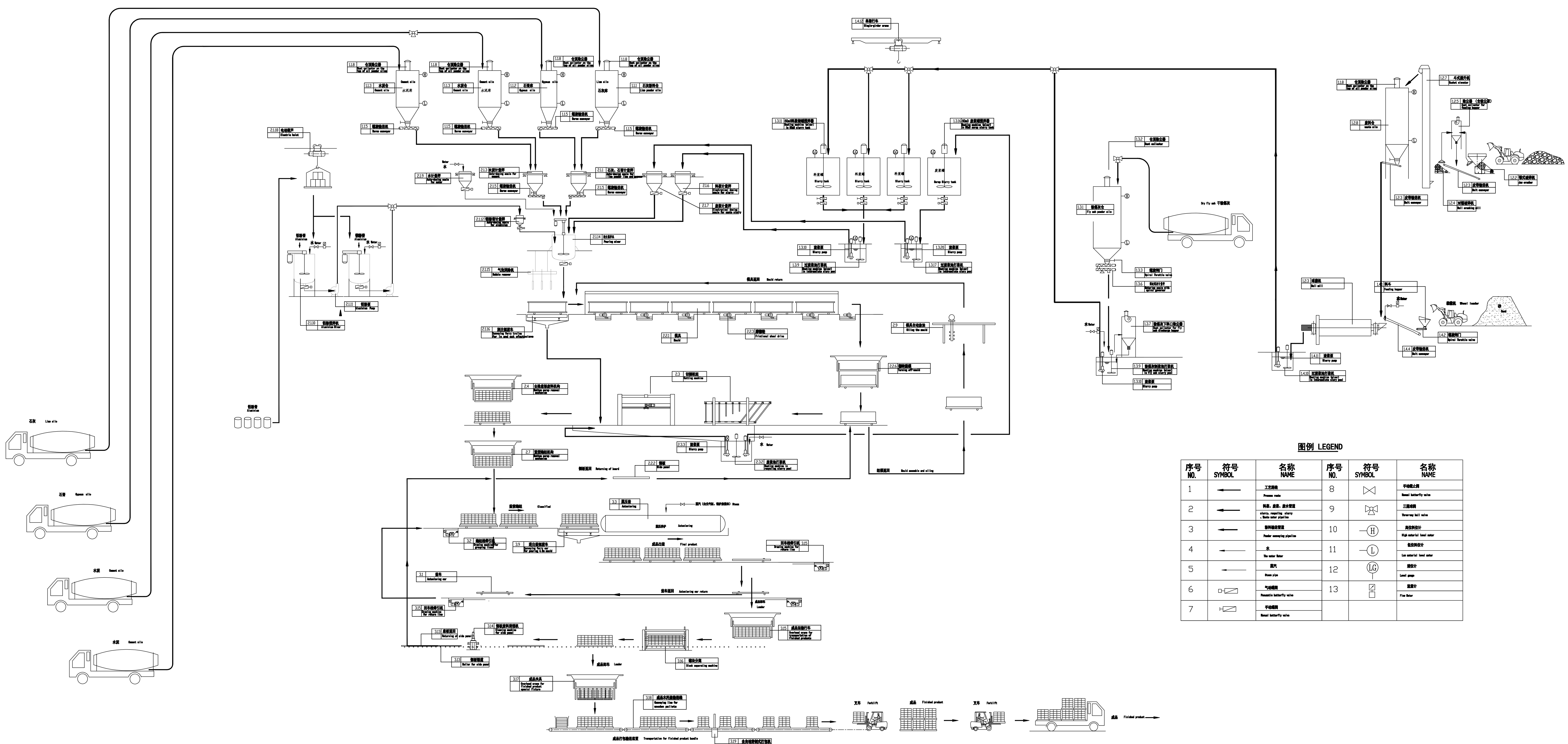
CONTRACT No.

PROJECT No. 1-01-030-2968

AMERICAS BEST BLOCK, INC.
KEYSER INDUSTRIAL PARK
MINERAL COUNTY
FINAL GRADING AND UTILITY PACKAGE
SITE PLAN

SHEET No. 2

ATTACHMENT F: DETAILED PROCESS FLOW DIAGRAM



图例 LEGEND

序号 NO.	符号 SYMBOL	名称 NAME	序号 NO.	符号 SYMBOL	名称 NAME
1	←	工艺路线 Process route	8	⋈	手动截止阀 Manual butterfly valve
2	←	料浆、废浆、废水管道 slurry, recycling slurry, Waste water pipeline	9		三通球阀 Three-way ball valve
3	←	粉料输送管道 Powder conveying pipeline	10	(H)	高位料位计 High material level meter
4	←	水 The water Water	11	(L)	低位料位计 Low material level meter
5	←	蒸汽 Steam pipe	12	(LG)	液位计 Level gauge
6		气动蝶阀 Pneumatic butterfly valve	13		流量计 Flow Meter
7		手动蝶阀 Manual butterfly valve			

建 都 JIANDU

北京建都设计研究院有限责任公司
Beijing Jiandu Design & Research Institute Co.,Ltd
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主页: www.jiandu.cn

会签栏 COUNTERSIGN

专业 PROFESSION	签字 SIGNATURE	日期 DATE
工艺 TECHNOLOGY		
总图 SITE PLAN		
建筑 ARCHITECTURE		
结构 STRUCTURE		
给排水 WATER SUPPLY & DRAINAGE		
暖通 HV & AC		
电气 ELECTRIC		

备注 REMARKS

建设单位 CLIENT

工程名称 PROJECT NAME
AAC Block Production Line in Annual Output of 120,000m3/year

工程编号 PROJECT NO.	
子项名称 SUB-ITEM	
子项编号 SUB-ITEM NO.	
阶段 DESIGN PHASE	

专业 PROFESSION		
	实名 NAME	签字 SIGNATURE
专业负责人 CHIEF		
审定 APPROVED BY		
审核 VERIFIED BY		
校对 CHECKED BY		
设计 DESIGNED BY		

图纸名称 DRAWING TITLE
工艺流程示意图
PROCESS FLOW DIAGRAM

版号 VERSION	图号 DRG NO.	张数 TOTAL SHEETS	比例 SCALE
			1:120

日期 DATE 2016-08-01

ATTACHMENT G: PROCESS DESCRIPTION

ATTACHMENT G – PROCESS DESCRIPTION

The America's Best Block facility is an autoclaved aerated concrete (AAC) block manufacturing facility that will operate under North American Industry Classification System (NAICS) Code 327331. The facility has the potential to produce approximately 120,000 cubic meters per day for 300 days and operate 3 shifts per day for an effective working time of 22.5 hours per day. The facility will consist of a raw material receiving and storage area, mixing tanks, autoclave curing ovens, a handling warehouse, and finished product storage.

The production process includes sand delivered to the plant via self-dumping trucks and stored on an open yard. A loader will be used to feed the sand into the sand feeding hopper and then to a ball mill through a belt metering scale and belt conveyor. During this process, water will be added into the ball mill to form sand slurry that will be pumped into three slurry storage tanks.

Fly ash will be delivered to the plant via bulk tank trucks and conveyed into the fly ash powder silo via a pneumatic conveyance device equipped on the tank truck. The fly ash will be measured by a spiral measuring scale that pours into a slurry pool where it is mixed with water. The fly ash and water slurry will be pumped into three slurry tanks.

Lime, cement, and gypsum will be delivered to the plant via bulk tank trucks and conveyed into their respective silos by a pneumatic conveyance device equipped on the tank truck. The silos will be equipped with a gate and single-solenoid feeder beneath the silo body so the cement and gypsum can be sent to an indoor metering scale.

Aluminum powder or paste packed in a bag or barrel will be delivered to the plant for temporary storage. From the storage area, the bags or barrels will be lifted to the first floor and opened manually to pour the aluminum powder or paste into the aluminum suspending liquid mixing tank. Water will be introduced to prepare the aluminum paste for use.

When the raw materials are ready, batching will be performed. Material in powder form (i.e., lime, cement, and gypsum) will be sent to the powder metering scale through screw conveyors for metering and weighing according to the given proportion. Sand slurry or fly ash slurry and recycled scrap slurry will be sent to liquid metering to be scaled to the correct proportion. The aluminum suspended liquid will flow into a metering scale for metering and will travel into the mixer. Upon completion of scaling all of the materials, they will be poured into the mixer individually with the slurry ingredients poured first, followed by the powder ingredients and lastly the aluminum suspended liquid. The metering, feeding, and mixing will be computer controlled. After mixing the slurry, it will be poured into a block mold located on a trolley. Then the trolley will transport the mold into the pre-curing room.

The material will become a "cake" after two to three hours in the pre-curing room. The cake will then be cut to form several sizes of product. Scrap left over from the cutting process will be checked for consistency and recycled back into the slurry mix for use in future molds. Cut cake will be moved to a trolley for transport to the autoclave process.

The cake will enter the autoclave for steaming and hardening. When complete, the hardened finished product will be checked for conformity with specifications, wrapped and moved to the storage yard. Some finished product that is damaged or broken during packaging and transporting will be cut into non-standard block for sale. Other waste product will be moved to a waste storage area. This waste will be crushed in a jaw crusher and stored in a waste silo, to be mixed with sand upstream of the ball mill and used as a raw material in the process.

ATTACHMENT H: MATERIAL SAFETY DATA SHEET (MSDS)

Safety Data Sheet
ALUMINIUM PASTE WITH MINERAL SPIRIT
Code MSDS Alp WS

Safety Data Sheet dated 01-06-2012, version 1.1
In compliance with the requirement of the Regulation (EC) N°1907/2006

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product Identifier

Mixture identification:

Trade name: **ALUMINIUM PASTE WITH MINERAL SPIRIT**

MSDS Code: **Alp WS**

1.2. Relevant identified uses of the substance/mixture and uses advised against

Recommended use:

Metallic paint (for automotive industry and industrial use)

Manufacture of inks

Manufacture of plastics

1.3. Details of the supplier of the safety data sheet

Company:

TOYAL EUROPE

Route de Lescun

F-64490 ACCOUS

Telephone (office hours): +33 (0)5 59 98 35 35

Fax:+33 (0)5 59 98 35 36

Competent person responsible for the safety data sheet:

reach@toyal-europe.com

1.4. Emergency telephone number

In case of transport accident or other emergency: Emergency CONTACT (24-Hour-Number): GBK/Infotrac ID 103679: (USA domestic) 1 800 535 5053 or international (001) 352 323 3500.

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Directive criteria, 67/548/CE, 99/45/EC and following amendments thereof:

Properties / Symbols:

None.

R Phrases:

R67 Vapours may cause drowsiness and dizziness.

EC regulation criteria 1272/2008 (CLP)

STOT SE 3, May cause drowsiness or dizziness.

Adverse physicochemical, human health and environmental effects:

No other hazards.

2.2. Label elements

Symbols:

Warning

Hazard statements:

H336 May cause drowsiness or dizziness.

Precautionary statements:

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Special Provisions:

None.

2.3. Other hazards

vPvB Substances: None - PBT Substances: None.

Other Hazards:

No other hazards.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not Relevant.

3.2. Mixtures

Hazardous components within the meaning of EEC directive 67/548 and CLP regulation and related classification:

40% - 90% Aluminium powder (stabilised)

Index number: 013-002-00-1, CAS: 7429-90-5, EC: 231-072-3

F; R11-15

Water-react. 2 H261

Flam. Sol. 1 H228

10% - 60% Naphtha (petroleum), hydrotreated heavy

Hydrocarbons, C9-C11, n-alkanes, isoalkanes, cyclics, <2% aromatics

REACH No.: 01-2119463258-33-0009, CAS: 64742-48-9

Xn; R10-65-66-67

Flam. Liq. 3 H226

STOT SE 3 H336

Asp. Tox. 1 H304

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

In case of skin contact:

Wash with plenty of water and soap.

In case of eyes contact:

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

In case of Ingestion:

Do not under any circumstances induce vomiting. OBTAIN A MEDICAL EXAMINATION IMMEDIATELY.

In case of Inhalation:

Remove casualty to fresh air and keep warm and at rest.

4.2. Most important symptoms and effects, both acute and delayed

None.

4.3. Indication of any immediate medical attention and special treatment needed

Treatment:

None.

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:
Dry sand
Metal fire powder
Extinguishing media which must not be used for safety reasons:
Water
CO_2
Dry powder
Alcohol foam
Halons

5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.
In case of contact with acid or alkaline (as well as water), aluminum powder will react and emission of hydrogen will occur.

5.3. Advice for fire-fighters

Use suitable breathing apparatus .
Move undamaged containers from immediate hazard area if it can be done safely.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear personal protection equipment.
Remove persons to safety.
See protective measures under point 7 and 8.

6.2. Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.
In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.
Suitable material for taking up: absorbing material, organic, sand.

6.3. Methods and material for containment and cleaning up

Pick up mechanically.

6.4. Reference to other sections

See also section 8 and 13.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid contact with skin and eyes, inhaltion of vapours and mists.
Don't use empty container before they have been cleaned.
Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.
Contamined clothing should be changed before entering eating areas.
Do not eat or drink while working.
See also section 8 for recomened protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Keep container tightly closed and store in well-ventilated areas.
Store in a dry and cool place.
Keep container dry
Protect from water
- Halogens
Keep away from food, drink and feed.
Incompatible materials:
Do not store with:
- Oxidizing agents;
- Acids;

- Alkalies;
- Nitrates;
- Alcohols;
- Halogenated hydrocarbons;

Instructions as regards storage premises:
Adequately ventilated premises.

7.3. Specific end use(s)
None in particular.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Naphtha (petroleum), hydrotreated heavy
Hydrocarbons, C9-C11, n-alkanes, isoalkanes, cyclics, <2% aromatics - CAS: 64742-48-9
OEL Type: France - LTE: 1000 mg/m3 - STE: 1500 mg/m3 - Notes: Vapeurs C6-C12
OEL Type: Germany - LTE: 300 mg/m3, 50 ppm - Notes: DE (DFG)

Aluminium powder (stabilised) - CAS: 7429-90-5
OEL Type: Germany - LTE: 4 mg/m3 - Notes: Aluminium metal - inhalable aerosol - DE (DFG)
OEL Type: Germany - LTE: 1.5 mg/m3 - Notes: Aluminium metal - respirable aerosol - DE (DFG)
OEL Type: France - LTE: 10 mg/m3 - Notes: Aluminium metal - inhalable aerosol
OEL Type: France - LTE: 5 mg/m3 - Notes: Aluminium metal - respirable aerosol
OEL Type: Spain - LTE: 10 mg/m3 - Notes: Aluminium metal - inhalable aerosol
OEL Type: Spain - LTE: 5 mg/m3 - Notes: Aluminium metal - respirable aerosol
OEL Type: United Kingdom - LTE: 10 mg/m3 - Notes: Aluminium metal - inhalable aerosol
OEL Type: United Kingdom - LTE: 4 mg/m3 - Notes: Aluminium metal - respirable aerosol

DNEL Exposure Limit Values
Naphtha (petroleum), hydrotreated heavy
Hydrocarbons, C9-C11, n-alkanes, isoalkanes, cyclics, <2% aromatics - CAS: 64742-48-9
Worker Industry: 208 mg/kg - Consumer: 125 mg/kg - Exposure: Human Dermal Long Term, systemic effects
Worker Industry: 871 mg/m3 - Consumer: 185 mg/m3 - Exposure: Human Inhalation Long Term, systemic effects
Consumer: 125 mg/kg - Exposure: Human Oral Long Term, systemic effects

PNEC Exposure Limit Values
N.A.

8.2. Exposure controls

Eye protection:
Eye glasses with side protection.

Protection for skin:
Coat.
Overall.

Protection for hands:
Suitable gloves type:
EN 420 / EN 374
Suitable material:
Cotton
Leather

Respiratory protection:

Use adequate protective respiratory equipment, e.g. CEN/FFP-2 or CEN/FFP-3.

Thermal Hazards:

None

Environmental exposure controls:

Not available

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance and colour:	Pasty - Silver
Odour:	Solvent
Odour threshold:	N.A.
pH:	N.A.
Melting point / freezing point:	- 20°C (naphtha) - 660°C (aluminium)
Initial boiling point and boiling range:	130 - 210°C (naphtha) - 2467°C (aluminium)
Solid/gas flammability:	N.A.
Upper/lower flammability or explosive limits:	Mini: 0.6% - Maxi: 7% (naphtha)
Vapour density:	N.A.
Flash point:	36°C (naphtha - closed cup)
Evaporation rate:	N.A.
Vapour pressure:	0.3 - 0.6 kPa (naphtha)
Relative density:	770 g/cm3 (naphtha - 15°C)
Solubility in water:	Insoluble (naphtha)
Lipid solubility:	N.A.
Partition coefficient (n-octanol/water):	N.A.
Auto-ignition temperature:	> 200°C (naphtha)
Decomposition temperature:	N.A.
Viscosity:	0.0009 cm2/s (naphtha - 40°C)
Explosive properties:	N.A.
Oxidizing properties:	N.A.

9.2. Other information

Miscibility:	N.A.
Fat Solubility:	N.A.
Conductivity:	N.A.
Substance Groups relevant properties	N.A.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

Stable under normal conditions.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

It may generate flammable gases on contact with water, mineral acids, organic acids, caustic substances, isocyanates, mercaptans, and other organic sulphides.
It may generate toxic gases on contact with azo, diazo and hydrazines compounds.
It may catch fire on contact with mineral acids, mercaptans and other organic sulphides, and powerful oxidising agents.
In case of contact with acid or alkaline (as well as water), aluminum powder will react and emission of hydrogen will occur.

10.4. Conditions to avoid

Moisture.

10.5. Incompatible materials

None in particular.

10.6. Hazardous decomposition products

Hydrogen.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Toxicological information of the mixture:

N.A.

There is no toxicological data available on the mixture. Consider the individual concentration of each component to assess toxicological effects resulting from exposure to the mixture.

Toxicological information of the main substances found in the mixture:

Naphtha (petroleum), hydrotreated heavy

Hydrocarbons, C9-C11, n-alkanes, isoalkanes, cyclics, <2% aromatics - CAS: 64742-48-9

a) acute toxicity:

Test: LD50 - Route: Oral - Species: Rat > 5000 mg/kg - Notes: OECD 401

Test: LD50 - Route: Skin - Species: Rabbit > 5000 mg/kg - Duration: 24H - Notes: OECD 402

Test: LC50 - Route: Inhalation - Species: Rat > 5000 mg/m3 - Duration: 8h - Notes: OECD 403 - Vapors

b) skin corrosion/irritation:

Test: Skin Irritant - Species: Rabbit Negative

c) serious eye damage/irritation:

Test: Eye Irritant - Species: Rabbit Negative

d) respiratory or skin sensitisation:

Test: Skin Sensitization - Species: GUINEA Negative

e) germ cell mutagenicity:

Test: Mutagenesis - Species: Generic Bacteria Negative

f) carcinogenicity:

Test: Carcinogenicity - Route: Inhalation - Species: Rat Negative

g) reproductive toxicity:

Test: Reproductive Toxicity - Route: Inhalation - Species: Rat Negative

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

There is no ecotoxicological data available on the mixture. Consider the individual concentration of each component to assess ecotoxicological effects resulting from exposure to the mixture.

Naphtha (petroleum), hydrotreated heavy

Hydrocarbons, C9-C11, n-alkanes, isoalkanes, cyclics, <2% aromatics - CAS: 64742-48-9

Test: EL50 Daphnia - Duration h: 48 - mg/l: 1000

Test: LL50 Fish - Duration h: 96 - mg/l: 1000

Test: EL50 Algae - Duration h: 72 - mg/l: 1000

Test: NOEL Daphnia - Duration h: 21 j - mg/l: 0.23

Test: NOEL Fish - Duration h: 28 j - mg/l: 0.13

12.2. Persistence and degradability

None.

12.3. Bioaccumulative potential

N.A.

12.4. Mobility in soil

N.A.

12.5. Results of PBT and vPvB assessment

vPvB Substances: None - PBT Substances: None.

12.6. Other adverse effects

None.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover if possible. In so doing, comply with the local and national regulations currently in force.

SECTION 14. TRANSPORT INFORMATION

14.1. UN number

Not classified as dangerous in the meaning of transport regulations.

14.2. UN proper shipping name

N.A.

14.3. Transport hazard class(es)

N.A.

14.4. Packing Group

N.A.

14.5. Environmental hazards

N.A.

14.6. Special Precautions for User

N.A.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No.

SECTION 15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Dir. 98/24/EC (Risks related to chemical agents at work).
Dir. 2000/39/EC (Occupational exposure limit values)

Where applicable, refer to the following regulatory provisions:

Directive 2003/105/CE ('Activities linked to risks of serious accidents') and subsequent amendments.
Regulation (EC) nr 648/2004 (detergents).
1999/13/EC (VOC directive).

15.2. Chemical Safety Assessment

No.

SECTION 16. OTHER INFORMATION

Full text of phrases referred to in Section 3:

R10 Flammable.
R11 Highly flammable.
R15 Contact with water liberates extremely flammable gases.
R65 Harmful: may cause lung damage if swallowed.
R66 Repeated exposure may cause skin dryness or cracking.
R67 Vapours may cause drowsiness and dizziness.

H226 Flammable liquid and vapour.
H336 May cause drowsiness or dizziness.
H304 May be fatal if swallowed and enters airways.
H261 In contact with water releases flammable gases.
H228 Flammable solid.

Paragraphs modified from the previous revision:

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING
16. OTHER INFORMATION

MSDS Code Alp WS = ALPATE 500, 520, 1168, 1265, 2007001, 8161 OS, 85001 OS

This safety data sheet has been completely updated in compliance with Regulation 453/2010/EU.

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

EAPA (European Aluminium Particulate Association)
ECHA CHEM (European Chemicals Agency)
TOXNET (Hazardous Substances Data Bank)
GESTIS International Limit Values (IFA)
ESIS (European chemical Substances Information System) - European Commission/Joint Research Centre/Institute for Health and Consumer Protection

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.
It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This document supersedes any previous version.

ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
CLP:	Classification, Labeling, Packaging.
EC50:	Median effective concentration.
IATA:	International Air Transport Association.
IMDG:	International Maritime Code for Dangerous Goods.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
LTE:	Long-term exposure.
N.A.:	Not available
OEL:	Occupational exposure limit.
PBT:	Persistent, Bioaccumulative and Toxic.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STE:	Short-term exposure.
vPvB:	very Persistent and very Bioaccumulative.

End of the Safety Data Sheet

COAL ASH

139 East Fourth Street
Cincinnati, Ohio 45202
Phone (513) 421-9500

Material Safety Data Sheet

Section 1. PRODUCT INFORMATION

PRODUCT NAME:	**COAL ASH**
CHEMICAL DESCRIPTION:	Inorganic Oxides (varying from fused or vitrified to fine granular solid)
PRODUCT CLASS:	Boiler Slag, Bottom Ash, or Fly Ash from Coal Combustion

Section 2. INFORMATION ON INGREDIENTS

Chemical Name	CAS Number	% by weight	OSHA PEL (mg/M^3)	ACGIH TLV (mg/M^3)
Silicon dioxide,SiO_2, fused amorphous	60676-86-0	40 - 60	10/(%SiO_2+2) resp. dust 30/(%SiO_2+2) total dust	0.1 (respirable)
Aluminum oxide, Al_2O_3	1344-28-1	15 - 30	15 total dust 5 resp. dust	10
Iron oxide, Fe_2O_3, dust and fume, as Fe	1309-37-1	5 - 35	10	5
Titanium dioxide, TiO_2	12137-20-1	1 - 3	15 total dust	10
Calcium oxide, CaO	1305-78-8	1 - 3	5	2
Potassium hydroxide, KOH	1310-58-3	1 - 3	none established	2 (ceiling)
Sulfur trioxide, SO_3	7446-11-9	0 - 1	none established	none established
Water	7732-18-5	<1 - 20	none established	none established

Section 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION! – Contact with wet skin may cause severe irritation.

Eye contact can cause severe irritation or conjunctivitis.

Inhalation of dust may irritate the throat or lungs.

Long-term overexposure may reduce pulmonary function.

Section 3. HAZARDS IDENTIFICATION (Continued)

PRIMARY ROUTES OF ENTRY: Inhalation of dust. Eye and skin contact. Ingestion of dust.

TARGET ORGANS: Eyes, skin, mucous membranes, lungs, kidney, liver, and blood.

MEDICAL CONDITIONS (AGGRAVATED BY EXPOSURE): Individuals with pre-existing conditions of emphysema or asthma may experience respiratory irritation from breathing dust. Skin conditions or dermatitis may be aggravated by contact with this material.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: Contact with eyes may cause irritation resulting in conjunctivitis.

SKIN CONTACT: Prolonged contact may result in minor irritation, mild reddening, or skin rash depending on the sulfur trioxide content. SO_3 reacts vigorously with water (or sweat) to form hydrosulfurous acid.

INGESTION: Ingestion of this product may cause diarrhea or irritation of the mucous membranes of the mouth, throat, esophagus and stomach.

INHALATION: Dust may cause respiratory irritation or fibrosing alveolitis (growth of fibrous tissue in the lung).

ACUTE/CHRONIC: Short-term exposure can produce dermatitis (skin inflammation), horny growths on the skin, conjunctivitis, and diarrhea. Long-term exposure to fly ash in extremely dusty environments (above the OSHA PEL) may result in pathology of the nerves in the extremities, blood-forming effects such as anemia, gastrointestinal irritation/colic, and cancer of the skin, liver, and lungs.

CARCINOGENICITY: NTP: No IARC: Yes (SO_3) OSHA: No

Section 4. FIRST AID MEASURES

EYE CONTACT: In case of contact, flush eyes for 15 minutes. Seek medical aid to ensure foreign matter is removed.

SKIN CONTACT: Avoid skin contact with fly ash. Wash skin thoroughly after exposure ceases.

INHALATION: Move victim to a dust-free environment. Support breathing as necessary.

INGESTION: Do not induce vomiting. Consult a physician.

Section 5. FIRE FIGHTING MEASURES

FLASH POINT: None.

LOWER FLAMMABLE LIMIT: None.

AUTO-IGNITION TEMERATURE: None.

DECOMPOSITION PRODUCTS: None.

EXTINGUISHING MEDIA: None required.

FIRE-FIGHTING INSTRUCTIONS: None required.

FIRE & EXPLOSION HAZARDS: None.

NFPA RATINGS: Health = 1 Flammability = 0 Reactivity = 0 Special Hazard = None

Scale: 0 = Normal material 1 = Slightly hazardous 2 = Hazardous 3 = Extremely dangerous 4 = Deadly

Section 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: Dispose of as conventional waste suitable for a municipal landfill.

Section 7. HANDLING AND STORAGE

HANDLING: No special requirements.

STORAGE: No special requirement; material is chemically and thermally stable.

Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT:

EYE/FACE PROTECTION: Use safety goggles if handling dry powder.

SKIN PROTECTION: Use coveralls and gloves to avoid skin contact with coal ash.

RESPIRATORY PROTECTION: Use a NIOSH-approved, high-efficiency, air-purifying respirator for dusty environments that exceed 10 mg/m^3 total dust.

ENGINEERING CONTROLS: Local exhaust or general dilution ventilation.

WORK PRACTICES: Do not “blow down” with compressed air or dry sweep. Use only a HEPA-filtered vacuum. Use wet methods or sweeping compound to minimize dust generation.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: Not applicable.

VAPOR PRESSURE: Not applicable.

VAPOR DENSITY: Not applicable.

%VOLATILE BY WEIGHT: 0

SOLUBILITY IN WATER: Moderate.

SPECIFIC GRAVITY (Apparent density): 2.2 - 2.8 g/cm^3

pH: Varies from acidic to basic dependent upon coal source.

FREEZING POINT: Not applicable.

APPEARANCE AND ODOR: **Fly ash** consists of minute glass spheres with some crystalline matter and varying amounts of unburned carbon. It ranges in color from light tan or light gray to almost black depending on the proportions of carbon and iron. **Bottom ash** is a granular material similar to fine concrete aggregate (concrete sand). It ranges in color from a medium brown or medium gray to almost black. **Boiler slag** is granular and angular with particle size similar to bottom ash. Slag is shiny black in color and its form resembles crushed coal or black glass. No odor.

Section 10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: None.

INCOMPATABILITY: None.

DECOMPOSITION PRODUCTS: None.

HAZARDOUS POLYMERIZATION: Will not occur.

CHEMICAL STABILITY: Stable under normal temperature and pressures.

Section 11. TOXICOLOGICAL INFORMATION

ON PRODUCT: Minor skin irritation (prolonged contact), conjunctivitis, and diarrhea.

ON INGREDIENTS:

Chemical Name	ROUTE OF ADMINISTRATION		
	Oral	Dermal (LD50)	Inhalation (TCLo)
Crystalline silica, fused	Not available	Not available	197 mg/m^3 (rat)
Aluminum oxide	Not available	Not available	Not available
Iron oxide	Not available	Not available	500 ug/m^3 (rat)
Titanium dioxide	Not available	300 ug/3D-Mild	250 ug/m^3 (rat)
Calcium oxide	Not available	Not available	Not available
Potassium hydroxide	273 mg/kg	1 mg/24H rinse-Mod.	Not available
Sulfur trioxide	Not available	Not available	30 mg/m^3 (human)

Section 12. ECOLOGICAL INFORMATION

Aquatic Toxicity: Testing on ash ponds consistently show the effluent to not be acutely toxic in 100% effluent for Ceriodaphnia dubia (water flea) and Pimephales promelas (fathead minnow).

Environmental Fate: Nearly all ash is inert upon release to the environment and would be deposited in the sediment. Less than 1% of ash would be dissolved in the water column.

Environmental Toxicity: When handled and disposed of properly, coal ash does not present an environmental threat.

Section 13. DISPOSAL CONSIDERATIONS

RCRA STATUS: This material is not a RCRA listed hazardous waste nor does it exhibit any hazardous waste characteristics.

DISPOSAL: Dispose of in a manner consistent with federal, state, or local laws and regulations.

Section 14. TRANSPORT INFORMATION

D.O.T. CLASSIFICATION: Not applicable; not a D.O.T. hazardous material.

Section 15. REGULATORY INFORMATION

TSCA: Not applicable.

CERCLA: Contains no known hazardous substances.

SARA TITLE III:

Section 302 Extremely Hazardous Substances: None at or above de minimis concentrations.

Section 311/312 Health and Physical Hazards: Delayed (chronic) health hazard from long-term inhalation of dust.

Section 313 Toxic Chemicals: None at or above de minimis concentrations.

Section 16. OTHER INFORMATION

HMIS RATINGS: Health = 1 Flammability = 0 Reactivity = 0 Personal Protection = B = Safety glasses + gloves

Hazard rating scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

PREPARED BY: Mark T. Nutter, CIH, CSP, Occupational Hygienist
Patrick C. Coyle, Sr. Environmental Scientist
Randall P. Born, Sr. Environmental Scientist
James J. Stieritz, Sr. Environmental Scientist

MATERIAL SAFETY DATA SHEET (MSDS) FOR GYPSUM

(Complies with OSHA's Hazard Communication Standard, 29 CFR 1910.1200)

CEMEX, INC.
920 Memorial City Way, SUITE 100
HOUSTON, TEXAS 77024

Section 1 - IDENTIFICATION

Supplier/Manufacturer

CEMEX, Inc.
920 Memorial City Way, Suite 100
Houston, Texas 77024

Emergency Contact Information

(713) 650-6200

Product name and synonyms

Calcium Sulfate Dihydrate, Gypsum Stone,
Hydrated Calcium Sulfate, Mineral White

Chemical family

Limestone/Dolomite (CAS #13397-24-5)

Formula

$CaSO_4 - 2H_2O$

Section 2 - COMPONENTS

Hazardous Ingredients

Respirable quartz (CAS# 14808-60-7) – greater than 0.1% by weight
ACGIH TLV-TWA (2006) = 0.025 mg respirable quartz dust/m^3
OSHA PEL (8-hour TWA) = (10 mg respirable dust/$m^{3)}$/(percent silica + 2)
NIOSH REL (8-hour TWA) = 0.05 mg respirable dust/m^3

Section 3 - HAZARD IDENTIFICATION

Potential Health Effects

Relevant Routes of Exposure:
Eye contact, skin contact, inhalation, and ingestion.

Effects Resulting from Eye Contact:
Exposure to airborne dust may cause immediate or delayed irritation or inflammation. Eye contact by large amounts of dry powder or splashes of wet gypsum dust may cause eye irritation. Such exposures may require immediate first aid (see Section 4) and medical attention to prevent damage to the eye.

Effects Resulting from Skin Contact:
Direct contact may cause irritation by mechanical abrasion.

Effects Resulting from Inhalation:
Gypsum may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free silica can aggravate other lung conditions and cause silicosis, a disabling and potentially fatal lung disease.

Exposure to gypsum dust may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Effects Resulting from Ingestion:
Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed.

Carcinogenic potential:
Limestone is **not** listed as a carcinogen by NTP, OSHA, or IARC. It may however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, which is a component of limestone, is now classified by IARC as known human carcinogen (Group I). NTP has characterized respirable silica as "reasonably anticipated to be [a] carcinogen".

Medical conditions which may be aggravated be, inhalation or dermal exposure:

Pre-existing upper respiratory and lung diseases.

Section 4 - FIRST AID

Eyes

Immediately flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician if irritation persists or later develops.

Skin

Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment if irritation persists or later develops.

Inhalation of Airborne Dust

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside.

Ingestion

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

Section 5 - FIRE AND EXPLOSION DATA

Flash point .....None	Lower Explosive Limit.....…...None
Upper Explosive Limit.....None	Auto ignition temperature.....….Not Combustible
Extinguishing media.....Not Combustible	Special fire fighting Procedures....….....None
Hazardous combustion products..None	Unusual fire and explosion hazards…..None

Section 6 - ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wetting of spilled materials may be beneficial to minimize generation of airborne dusts.

None of the components of this product are subject to the reporting requirements of Title III of SARA 1986, and 40 CFR 372.

Section 7 - HANDLING AND STORAGE

Follow the personal protection and controls set forth in Section 8 of this MSDS when handling this product. Respirable crystalline silica-containing dust may be generated during processing, handling and storage.

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Skin Protection

Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using the toilet facilities. Wash work cloths after each use.

Respiratory Protection

Avoid actions that cause dust to become airborne. Use local or general exhaust ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA approved (under 30 CFR 11) or NIOSH approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after June 10, 1998 must be certified under 42 CFR 84.)

Ventilation

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye Protection

Safety glasses with side shields should be worn as minimum protection. In extremely dusty environments and unpredictable environments wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with products which may generate airborne dust.

Section 9 - PHYSICAL AND CHEMICAL, PROPERTIES

Odor.....….....No distinct odor
Solubility in water...Negligible
Vapor density.....Not applicable
Melting point.....Not applicable
Evaporation rate.....Not applicable

Physical state.....……White or nearly white, odorless, crystalline solid
Vapor pressure.....…….…...Not applicable
Boiling point.....…….....Not applicable (i.e., > 1000 C)
Specific gravity (H20 = 1.0)…...2.32

Section 10 - STABILITY AND REACTIVITY

Stability
Stable.

Conditions to avoid
Avoid contact with incompatible materials (see below).

Incompatibility
Materials to avoid include; Aluminum (at high temperatures), Diazomethane.

Hazardous decomposition
Will not spontaneously occur. Silica-containing respirable dust particles may be generated by handling.

Hazardous Polymerization
Will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

For a description of available, more detailed toxicological information contact the supplier or manufacturer.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity
No recognized unusual toxicity to plants or animals

Relevant physical and chemical properties
(See Sections 9 and 10.)

Section 13 - DISPOSAL

Pickup and reuse clean materials. Dispose of waste materials in accordance with applicable federal, state, and local laws and regulations.

Where applicable, dispose of bags in an approved landfill or incinerator.

Section 14 - TRANSPORTATION DATA

Hazardous materials description/proper shipping name
Not hazardous under U.S. Department of Transportation (DOT) regulations.

Hazard class
Not applicable.

Identification number
Not applicable

Required label text
Not applicable.

Hazardous substances/reportable quantities (RQ)
Not applicable.

Section 15 - OTHER REGULATORY INFORMATION

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200

Gypsum is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

Status under CERCLA/SUPERFUND 40 CFR 117 and 302

Not listed.

Hazard Category under SARA(Title III), Sections 311 and 312

Gypsum qualifies as a "hazardous substance" with delayed health effects.

Status under SARA (Title III), Section 313

Not subject to reporting requirements under Section 313.

Status under TSCA (as of May 1997)

Some substances in gypsum are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act

Gypsum is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under California Proposition 65

This product contains up to 0.05 percent of chemicals (trace elements) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove that the defined risks do not exist.

Section 16 - OTHER INFORMATION

Prepared by

Kevin Keegan
Director - Health and Safety
CEMEX, Inc.
Houston, Texas

Approval date or Revision date

Approved: July 1998
Revised: January 2008

Other important information

This product should only be used by knowledgeable persons. While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards this product as it is commonly used, the sheet cannot anticipate and provide the all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY CEMEX, Inc. except that the product shall conform to contracted specifications. The information provided herein was believed by CEMEX, Inc. to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

Material Safety Data Sheet
HYDRATED LIME

Rev. Date:5/1/2008

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name:	**Hi-Cal Hydrate**	
Synonym/s:	**Hydrate, High Calcium Hydrated Lime, Type N Hydrated Lime, HL**	
Manufacturer:	**US Operations:** **Chemical Lime Co.** **3700 Hulen St.** **Fort Worth, TX 76107** **817-732-8164**	**Canadian Operations:** **Chemical Lime Co. of Canada Inc.** **20302-102B Ave.** **Langley, BC V1M 3H1** **604-888-4333**
Emergency Phone:	**Chemtrec 1-800-424-9300**	
Chemical Name: **Chemical Family:** **Chemical Formula:**	**Calcium Hydroxide** **Alkaline Earth Hydroxide** **$Ca(OH)_2$**	**WHMIS Classification:** **D2A, E**
Product Use/s:	**Water treatment, pH adjustment, FGT, Construction, Pulp/Paper**	
Prepared By:	**Chemical Lime Co.** **R&D/Technical Services, KSA**	

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS	OSHA PEL, TWA 8/40h (mg/m3)	ACGIH TLV, TWA 8/40h (mg/m3)	NIOSH REL, TWA 8/40h (mg/m3)	NIOSH IDLH (mg/m3)	Conc. (%)
Calcium Hydroxide, $Ca(OH)_2$ (Hydrated Lime)	**1305-62-0**	**15** (total dust) **5** (respirable)	**5**	**5**	**N.A.**	**> 90**
Magnesium Hydroxide, $Mg(OH)_2$ (Brucite)	**1309-42-8**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**< 5**
Magnesium Oxide, MgO (Periclase)	**1309-48-4**	**10**	**10**	**N.A.**	**N.A.**	**< 5**
Calcium Carbonate, $CaCO_3$ (Limestone)	**1317-65-3 (471-34-1)**	**15** (total dust) **5** (respirable)	**10**	**10** (total dust) **5** (respirable)	**N.A.**	**< 3**
Crystalline Silica, SiO_2 (Quartz)	**14808-60-7**	**10/(SiO2% + 2)** (respirable)	**0.025** (respirable)	**0.05** (respirable)	**50**	**< 2**

OSHA Regulatory Status: This material is subject to 29 CFR 1910.1200 (Hazard Communication).

SECTION 3: HAZARDS IDENTIFICATION

Emergency Overview: Hydrate is an odorless white or grayish-white powder. Contact can cause irritation to eyes, skin, respiratory system, and gastrointestinal tract.

Potential Health Effects

Eyes: Contact can cause severe irritation or burning of eyes, including permanent damage.

Skin: Contact can cause irritation of skin.

Ingestion: This product can cause severe irritation of gastrointestinal tract if swallowed.

Inhalation: This product can cause severe irritation of the respiratory system. Long-term exposure may cause permanent damage. Hydrate is not listed by MSHA, OSHA, or IARC as a carcinogen However, this product may contain trace amounts of crystalline silica in the form of quartz or crystobalite, which has been classified by IARC as a Group I carcinogen to humans when inhaled. Inhalation of silica can also cause a chronic lung disorder, silicosis.

Medical Conditions Aggravated by Exposure: Contact may aggravate disorders of the eyes, skin, gastrointestinal tract, and respiratory system.

Potential Environmental Effects: This material is alkaline and if released into water or moist soil will cause an increase in pH.

SECTION 4: FIRST AID MEASURES

Eyes: Immediately flush eyes with generous amounts of water or eye wash solution if water is unavailable. Pull back eyelid while flushing to ensure that all lime dust has been washed out. Seek medical attention promptly if the initial flushing of the eyes does not remove the irritant. Do not rub eyes.

Skin: Brush off or remove as much dry lime as possible. Wash exposed area with large amounts of water. If irritation persists, seek medical attention promptly.

Inhalation: Move victim to fresh air. Seek medical attention. If breathing has stopped, give artificial respiration.

Ingestion: Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth unless instructed to do so by medical personnel.

SECTION 5: FIRE FIGHTING MEASURES

Fire Hazards:	Hydrate is not combustible or flammable. However, hydrate reacts vigorously with acids, and may release heat sufficient to ignite combustible materials in specific instances. Hydrate is not considered to be an explosion hazard, although reaction with acids or other incompatible materials may rupture containers.
Hazardous Combustion Products:	None
Extinguishing Media:	Use dry chemical fire extinguisher. Do not use water or halogenated compounds, except that large amounts of water may be used to deluge small quantities of hydrate.
Fire Fighting Instructions:	Keep personnel away from and upwind of fire. Avoid skin contact or inhalation of dust. Wear full fire-fighting turn-out gear (full Bunker gear), and respiratory protection (SCBA).

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill / Leak Procedures:	**Do Not** use water on bulk material spills. Use proper protective equipment.
Small Spills:	Use dry methods to collect spilled materials. Avoid generating dust. Do not clean up with compressed air. Store collected materials in dry, sealed plastic or non-aluminum metal containers. Residue on surfaces may be water washed.
Large Spills:	Use dry methods to collect spilled materials. Evacuate area downwind of clean-up operations to minimize dust exposure. Store spilled materials in dry, sealed plastic or non-aluminum metal containers.
Containment:	Minimize dust generation and prevent bulk release to sewers or waterways.
Clean-up:	Residual amounts of material can be flushed with large amounts of water. Equipment can be washed with either a mild vinegar and water solution, or detergent and water.

SECTION 7: HANDLING AND STORAGE

Handling:	Keep in tightly closed plastic or non-aluminum metal containers. Protect containers from physical damage. Avoid direct skin contact with the material.
Storage:	Store in a cool, dry, and well-ventilated location. Do not store near acids or other incompatible materials. Keep away from moisture. Do not store or ship in aluminum containers.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:	Provide ventilation adequate to maintain PELs.
Respiratory Protection:	Use NIOSH/MSHA approved respirators if airborne concentration exceeds PELs.
Skin Protection:	Use appropriate gloves and footwear to prevent skin contact. Clothing should fully cover arms and legs. Should lime get inside clothing or gloves, remove the clothing and the lime promptly.
Eye Protection:	Use safety glasses with side shields or safety goggles. Contact lenses should not be worn when working with lime products.
Other:	Eye wash fountain/stations and emergency showers should be available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	**Odor:**	**Physical State:**
White or grayish-white powder	Odorless	Solid
Boiling Point (°C/°F):	**Melting Point (°C/°F):**	**Specific Gravity**
2850 / 5162	dec 580 / 1076	(Apparent) g/cc: 0.4 - 0.55 (True) g/cc: 2.2 - 2.4
Vapor Pressure (mm Hg):	**Vapor Density:**	**Evaporation Rate:**
N.A.	N.A.	N.A.
Solubility in Water	**pH (25°C/77°F):**	
Slightly soluble in water.	12.4	

SECTION 10: STABILITY AND REACTIVITY

Stability: Chemically stable, but slowly reacts with carbon dioxide to form calcium carbonate. See also Incompatibility below.

Incompatibility/ Conditions to Avoid: Hydrate should not be mixed or stored with the following materials, due to the potential for vigorous reaction and release of heat:

Acids (unless in a controlled process)	Organic Acid Anhydrides
Reactive Fluoridated Compounds	Nitro-Organic Compounds
Reactive Brominated Compounds	Reactive Phosphorous Compounds
Reactive Powdered Metals	Interhalogenated Compounds

Hazardous Decomposition Products: None

Hazardous Polymerization: None

SECTION 11: TOXICOLOGICAL INFORMATION

ORL-RAT LD50: 7,340 MG/KG
ORL-MUS LD50: 7,300 MG/KG

Hydrated Lime is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain trace amounts of crystalline silica, which has been classified by IARC as carcinogenic to humans when inhaled in the form of quartz or crystobalite.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity: Because of the high pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems in high concentrations.

Environmental Fate: This material shows no bioaccumulation effect or food chain concentration toxicity.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable federal, state, and local environmental regulations. If this product as supplied, and unmixed, becomes a waste, it will not meet the criteria of a hazardous waste as defined under the U.S. Resource Conservation and Recovery Act (RCRA).

SECTION 14: TRANSPORTATION INFORMATION

Hydrate is not classified as a hazardous material by US DOT and is not regulated by the Transportation of Dangerous Goods (TDG) when shipped by any mode of transport.

SECTION 15: REGULATORY INFORMATION

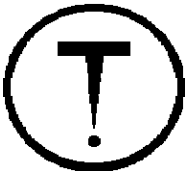
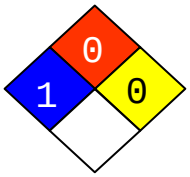
U.S. EPA Regulations:
RCRA Hazardous Waste Number (40 CFR 261.33): not listed
RCRA Hazardous Waste Classification (40 CFR 261): not classified
CERCLA Hazardous Substance (40 CFR 302.4) unlisted specific per RCRA, Sec. 3001; CWA, Sec. 311(b)(4); CWA, Sec. 307(a), CAA, Sec. 112
CERCLA Reportable Quantity (RQ), not listed
SARA 311/312 Codes: not listed
SARA Toxic Chemical (40 CFR 372.65): not listed
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): not listed, Threshold Planning Quantity (TPQ): not listed
All chemical ingredients are listed on the USEPA TSCA Inventory List.

OSHA/MSHA Regulations:
Air Contaminant (29 CRF 1910.1000, Table Z-1, Z-1-A): 5mg/M^3 TWA-8
MSHA: not listed
OSHA Specifically Regulated Substance (29 CFR 1910): not listed

State Regulations:
Consult state and local authorities for guidance. Components found in this product may contain trace amounts of inherent naturally occurring elements (such as, but not limited to arsenic and cadmium) that may be regulated.

Canada:
WHMIS Classification: "D2A" Materials Causing Other Toxic Effects
WHMIS Classification: "E" Corrosive Materials (listed due to corrosive effect on aluminum)
Canada DSL: Listed

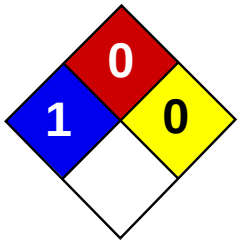
NFPA Hazard Class: Health: 1 Flammability: 0 Reactivity: 0
HMIS Hazard Class: Health: 1 Flammability: 0 Reactivity: 0 Personal Protection: E

SECTION 16: OTHER INFORMATION

Prepared By: **Chemical Lime Company, R&D/Technical Services, KSA**

Chemical Lime Company provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person. Individuals receiving this information must consult their own technical and legal advisors and/ or exercise their own judgment in determining its appropriateness for a particular purpose. Chemical Lime Company makes no representations or warranties, either express or implied, including without limitation and warranties of merchantability or fitness for a particular purpose with respect to the information set forth herein or the product(s) to which the information refers. Accordingly, Chemical Lime Company will not be responsible or liable for any claims, losses or damages resulting from the use of or reliance upon or failure to use this information.



Material Safety Data Sheet
Sand MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sand

Catalog Codes: SLS3064

CAS#: 14808-60-7

RTECS: VV73330000

TSCA: TSCA 8(b) inventory: Quartz

CI#: Not applicable.

Synonym: Sand; Sea Sand

Chemical Name: Not available.

Chemical Formula: SiO2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Feldspars (Ca, K, Na) Alluminum Silicates		
Quartz (Crystalline Silica)	14808-60-7	

Toxicological Data on Ingredients: Sand LD50: Not available. LC50: Not available. Quartz: LCL (Human) - Route: Inhalation; Dose: 300 ug/m3/10Y.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC. Classified A2 (Suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to lungs, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Keep container tightly closed.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Do not breathe dust. Wear suitable protective clothing. If you feel unwell, seek medical attention and show the label when possible. Keep away from incompatibles such as oxidizing agents, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 24°C (75.2°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States] Respirable [Quartz or Crystalline Silica] TWA: 0.05 (mg/m3) from NIOSH Respirable. [Quartz or Crystalline Silica]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Granular solid.)

Odor: Odorless.

Taste: Tasteless.

Molecular Weight: Not available.

Color: Amber. Grey.

pH (1% soln/water): Not applicable.

Boiling Point: Not available.

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: 1.8 to 2.5+ (depending on mineral compostion) (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water, methanol, diethyl ether, n-octanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatibles

Incompatibility with various substances: Reactive with oxidizing agents, alkalis.

Corrosivity: Not available.

Special Remarks on Reactivity:
Incompatible with oxidizing agents such as fluorine, chlorine trifluoride, manganese trioxide, oxygen difluroide. When exposed to high temperature quartz can change crystalline structure to form tridymite (above 870 C) or crystobalite (above 1470 C). Soluble in hydrofluoric acid and produces a corrosive gas - silicon tetrafluoride. Quartz is attacked by strong alkalis and hydrofluoric acid.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC. Classified A2 (Suspected for human.) by ACGIH. May cause damage to the following organs: lungs, upper respiratory tract.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May contain more than 1% quartz and may cause cancer (tumorigenic). Quartz has been identified by IARC as a class 1 carcinogen.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: No adverse health effects expected. Eyes: May cause eye irritation. Ingestion: No adverse health effects expected. Inhalation: Affects respiration and irritates respiratory tract. Acute pneumoconiosis from overwhelming exposure to silica dust has occurred. Coughing and irritation of throat are early symptoms. Inhalation of quartz is classified as a human carcinogen. Risk of cancer depends upon duration and level of exposure. May also affect liver. Chronic exposure can also cause silicosis, a form of lung scaring that can cause shortness of breath, reduced lung function. May also affect blood. Aggravation of Pre-existing Conditions: Inhalation may increase the progression of tuberculosis; susceptibility is apparently not inceased. Persons with impaired respiratory function may be more susceptible to the effects of this substance. Smoking can increase the risk of lung injury. Material is irritating to mucous membranes and upper respiratory tract.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Quartz California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Quartz TSCA 8(b) inventory: Quartz

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
R45- May cause cancer. S2- Keep out of the reach of children. S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II.

Other Special Considerations: Not available.

Created: 10/09/2005 06:23 PM

Last Updated: 05/21/2013 12:00 PM

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Material Safety Data Sheet

Section 1: PRODUCT AND COMPANY INFORMATION

Product Name(s): Lafarge Portland Cement (cement)

Product Identifiers: Cement, Portland Cement, Hydraulic Cement, Oil Well Cement, Trinity® White Cement, Antique White Cement, Portland Limestone Cement, Portland Cement Type I, IA, IE, II, I/II, IIA, II L.A., III, IIIA, IV, IVA, V, VA, 10, 20, 30, 40, 50, GU, GUL, MS, MH, HE, LH, HS, OWH, OWG Cement, OW Class G HSR

Manufacturer:
Lafarge North America Inc.
12018 Sunrise Valley Dr, Suite 500
Reston, VA 20191

Information Telephone Number:
703-480-3600 (9am to 5pm EST)
Emergency Telephone Number:
1-800-451-8346 (3E Hotline)

Product Use: Cement is used as a binder in concrete and mortars that are widely used in construction. Cement is distributed in bags, totes and bulk shipment.

Note: This MSDS covers many types of Portland cement. Individual composition of hazardous constituents will vary between types of Portland cement.

Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent (By Weight)	CAS Number	OSHA PEL -TWA (mg/m^3)	ACGIH TLV-TWA (mg/m^3)	LD_{50} (mouse, intraperitoneal)	LC_{50}
Portland Cement*	100	65997-15-1	15 (T); 5 (R)	1 (R)	NA	NA
Calcium Sulfate*	2-10	13397-24-5	15 (T); 5 (R)	10 (T)	NA	NA
Calcium Carbonate*	0-15	1317-65-3	15 (T); 5 (R)	3 (R), 10 (T)	NA	NA
Calcium Oxide	0-5	1305-78-8	5 (T)	2 (T)	3059 mg/kg	NA
Magnesium Oxide	0-4	1309-48-4	15 (T)	10 (T)	NA	NA
Crystalline Silica	0-0.2	14808-60-7	[(10) / (%SiO_2+2)] (R); [(30) / (%SiO_2+2)] (T)	0.025 (R)	NA	NA

Note: Exposure limits for components noted with an * contain no asbestos and <1% crystalline silica

Cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals may be detected during chemical analysis. For example, cement may contain trace amounts of calcium oxide (also known as free lime or quick lime), free magnesium oxide, potassium and sodium sulfate compounds, chromium compounds, nickel compounds, and other trace compounds.

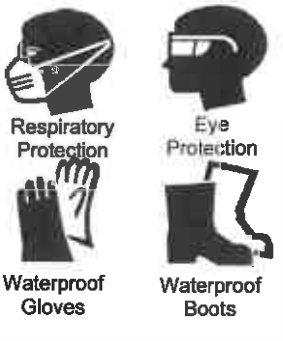
Section 3: HAZARD IDENTIFICATION

WARNING

Corrosive - Causes severe burns.
Toxic - Harmful by inhalation.
(Contains crystalline silica)

Use proper engineering controls, work practices, and personal protective equipment to prevent exposure to wet or dry product.

Read MSDS for details.



Section 3: HAZARD IDENTIFICATION (continued)

Emergency Overview: Cement is a solid, grey, off white, or white odorless powder. It is not combustible or explosive. A single, short-term exposure to the dry powder presents little or no hazard. Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible tissue (skin, eye, respiratory tract) damage due to chemical (caustic) burns, including third degree burns.

Potential Health Effects:

Eye Contact: Airborne dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of dry powder or with wet cement can cause moderate eye irritation, chemical burns and blindness. Eye exposures require immediate first aid and medical attention to prevent significant damage to the eye.

Skin Contact: Cement may cause dry skin, discomfort, irritation, severe burns, and dermatitis.

Burns: Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible damage to skin, eye, respiratory and digestive tracts due to chemical (caustic) burns, including third degree burns. A skin exposure may be hazardous even if there is no pain or discomfort.

Dermatitis: Cement is capable of causing dermatitis by irritation and allergy. Skin affected by dermatitis may include symptoms such as, redness, itching, rash, scaling, and cracking.

Irritant dermatitis is caused by the physical properties of cement including alkalinity and abrasion.

Allergic contact dermatitis is caused by sensitization to hexavalent chromium (chromate) present in cement. The reaction can range from a mild rash to severe skin ulcers. Persons already sensitized may react to the first contact with cement. Others may develop allergic dermatitis after years of repeated contact with cement.

Inhalation (acute): Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure. Inhalation of high levels of dust can cause chemical burns to the nose, throat and lungs.

Inhalation (chronic): Risk of injury depends on duration and level of exposure.

Silicosis: This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. See Note to Physicians in Section 4 for further information.

Carcinogenicity: Cement is not listed as a carcinogen by IARC or NTP; however, cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Autoimmune Disease: Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.

Tuberculosis: Silicosis increases the risk of tuberculosis.

Renal Disease: Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

Section 3: HAZARD IDENTIFICATION (continued)

Ingestion: Do not ingest cement. Although ingestion of small quantities of cement is not known to be harmful, large quantities can cause chemical burns in the mouth, throat, stomach, and digestive tract.

Medical Conditions Aggravated by Exposure: Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) or sensitivity to hexavalent chromium can be aggravated by exposure.

Section 4: FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis, and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately.

Note to Physician: The three types of silicosis include:

- Simple chronic silicosis – which results from long-term exposure (more than 20 years) to low amounts of respirable crystalline silica. Nodules of chronic inflammation and scarring provoked by the respirable crystalline silica form in the lungs and chest lymph nodes. This disease may feature breathlessness and may resemble chronic obstructive pulmonary disease (COPD).
- Accelerated silicosis – occurs after exposure to larger amounts of respirable crystalline silica over a shorter period of time (5-15 years). Inflammation, scarring, and symptoms progress faster in accelerated silicosis than in simple silicosis.
- Acute silicosis – results from short-term exposure to very large amounts of respirable crystalline silica. The lungs become very inflamed and may fill with fluid, causing severe shortness of breath and low blood oxygen levels.

Progressive massive fibrosis may occur in simple or accelerated silicosis, but is more common in the accelerated form. Progressive massive fibrosis results from severe scarring and leads to the destruction of normal lung structures.

Section 5: FIREFIGHTING MEASURES

Flashpoint & Method: Non-combustible

General Hazard: Avoid breathing dust. Wet cement is caustic.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Firefighting Equipment: Cement poses no fire-related hazard. A SCBA is recommended to limit exposures to combustion products when fighting any fire.

Combustion Products: None.

Section 6: ACCIDENTAL RELEASE MEASURES

General: Place spilled material into a container. Avoid actions that cause the cement to become airborne. Avoid inhalation of cement and contact with skin. Wear appropriate protective equipment as described in Section 8. Scrape wet cement and place in container. Allow material to dry or solidify before disposal. Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).

Waste Disposal Method: Dispose of cement according to Federal, State, Provincial and Local regulations.

Section 7: HANDLING AND STORAGE

General: Keep bulk and bagged cement dry until used. Stack bagged material in a secure manner to prevent falling. Bagged cement is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures.

Engulfment hazard. To prevent burial or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains cement. Cement can buildup or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving cement powders through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and injury to workers.

Usage: Cutting, crushing or grinding hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below.

Housekeeping: Avoid actions that cause the cement to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8 below.

Storage Temperature: Unlimited. **Storage Pressure:** Unlimited.

Clothing: Promptly remove and launder clothing that is dusty or wet with cement. Thoroughly wash skin after exposure to dust or wet cement.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls: Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits.

Personal Protective Equipment (PPE):

Respiratory Protection: Under ordinary conditions no respiratory protection is required. Wear a NIOSH approved respirator that is properly fitted and is in good condition when exposed to dust above exposure limits.

Eye Protection: Wear ANSI approved glasses or safety goggles when handling dust or wet cement to prevent contact with eyes. Wearing contact lenses when using cement, under dusty conditions, is not recommended.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION (continued)

Skin Protection: Wear gloves, boot covers and protective clothing impervious to water to prevent skin contact. Do not rely on barrier creams, in place of impervious gloves. Remove clothing and protective equipment that becomes saturated with wet cement and immediately wash exposed areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid (powder).	**Evaporation Rate:**	NA.
Appearance:	Gray, off white or white powder.	**pH (in water):**	12 – 13
Odor:	None.	**Boiling Point:**	>1000° C
Vapor Pressure:	NA.	**Freezing Point:**	None, solid.
Vapor Density:	NA.	**Viscosity:**	None, solid.
Specific Gravity:	3.15	**Solubility in Water:**	Slightly (0.1 - 1.0%)

Section 10: STABILITY AND REACTIVITY

Stability: Stable. Keep dry until use. Avoid contact with incompatible materials.

Incompatibility: Wet cement is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

Hazardous Polymerization: None. **Hazardous Decomposition:** None.

Section 11 and 12: TOXICOLOGICAL AND ECOLOGICAL INFORMATION

For questions regarding toxicological and ecological information refer to contact information in Section 1.

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste and containers in compliance with applicable Federal, State, Provincial and Local regulations.

Section 14: TRANSPORT INFORMATION

This product is not classified as a Hazardous Material under U.S. DOT or Canadian TDG regulations.

Section 15: REGULATORY INFORMATION

OSHA/MSHA Hazard Communication: This product is considered by OSHA/MSHA to be a hazardous chemical and should be included in the employer's hazard communication program.

CERCLA/SUPERFUND: This product is not listed as a CERCLA hazardous substance.

EPCRA SARA Title III: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered a hazardous chemical and a delayed health hazard.

EPRCA SARA Section 313: This product contains none of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Section 15: REGULATORY INFORMATION (continued)

RCRA:	If discarded in its purchased form, this product would not be a hazardous waste either by listing or characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.
TSCA:	Portland cement and crystalline silica are exempt from reporting under the inventory update rule.
California Proposition 65:	Crystalline silica (airborne particulates of respirable size) and Chromium (hexavalent compounds) are substances known by the State of California to cause cancer.
WHMIS/DSL: 	Products containing crystalline silica and calcium carbonate are classified as D2A, E and are subject to WHMIS requirements.

Section 16: OTHER INFORMATION

Abbreviations:

>	Greater than	NA	Not Applicable
ACGIH	American Conference of Governmental Industrial Hygienists	NFPA	National Fire Protection Association
CAS No	Chemical Abstract Service number	NIOSH	National Institute for Occupational Safety and Health
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NTP	National Toxicology Program
		OSHA	Occupational Safety and Health Administration
CFR	Code for Federal Regulations	PEL	Permissible Exposure Limit
CL	Ceiling Limit	pH	Negative log of hydrogen ion
DOT	U.S. Department of Transportation	PPE	Personal Protective Equipment
EST	Eastern Standard Time	R	Respirable Particulate
HEPA	High-Efficiency Particulate Air	RCRA	Resource Conservation and Recovery Act
HMIS	Hazardous Materials Identification System	SARA	Superfund Amendments and Reauthorization Act
IARC	International Agency for Research on Cancer	T	Total Particulate
		TDG	Transportation of Dangerous Goods
LC_{50}	Lethal Concentration	TLV	Threshold Limit Value
LD_{50}	Lethal Dose	TWA	Time Weighted Average (8 hour)
mg/m^3	Milligrams per cubic meter	WHMIS	Workplace Hazardous Materials Information System
MSHA	Mine Safety and Health Administration		

This MSDS (Sections 1-16) was revised on March 1, 2011.

An electronic version of this MSDS is available at: www.lafarge-na.com under the Sustainability section.

Lafarge North America Inc. (LNA) believes the information contained herein is accurate; however, LNA makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein which is not intended to be and should not be construed as legal advice or as insuring compliance with any federal, state or local laws or regulations. Any party using this product should review all such laws, rules, or regulations prior to use, including but not limited to US and Canada Federal, Provincial and State regulations.

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE.

ATTACHMENT I: EMISSIONS UNIT TABLE

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
S-1.1.1	E-1.1.8a	Lime Silo	2017	22,054 tpy	New	DC 1.1.8a
S-1.1.2	E-1.1.8b	Gypsum Silo	2017	2,206 tpy	New	DC 1.1.8b
S-1.1.3a	E-1.1.8c	Cement Silo 1	2017	7,351 tpy	New	DC 1.1.8c
S-1.1.3b	E-1.1.8d	Cement Silo 2	2017	7,351 tpy	New	DC 1.1.8d
S-1.1.5a	N/A – Fully Enclosed	Lime Screw Conveyor	2017	22,054 tpy	New	Enclosed
S-1.1.5b	N/A – Fully Enclosed	Gypsum Screw Conveyor	2017	2,206 tpy	New	Enclosed
S-1.1.5c	N/A – Fully Enclosed	Cement Screw Conveyor 1	2017	7,351 tpy	New	Enclosed
S-1.1.5d	N/A – Fully Enclosed	Cement Screw Conveyor 2	2017	7,351 tpy	New	Enclosed
S-2.1.1	N/A – Fully Enclosed	Auto-dosing scale for Lime and Gypsum	2017	24,260 tpy	New	Enclosed
S-2.1.3	N/A – Fully Enclosed	Auto-dosing scale for Cement	2017	7,351 tpy	New	Enclosed
S-2.1.5a	N/A – Fully Enclosed	Lime and Gypsum Screw Conveyor	2017	24,260 tpy	New	Enclosed
S-2.1.5b	N/A – Fully Enclosed	Cement Screw Conveyor 3	2017	7,351 tpy	New	Enclosed
S-2.1.14	N/A – Fully Enclosed	Pouring Mixer	2017	31,672 tpy	New	Enclosed
S-P-Waste	Fugitive	Waste Product Pile	2017	2,480 tpy	New	Partially Enclosed
S-1.2.2	E-1.2.5	Waste Jaw Crusher	2017	2,480 tpy	New	DC 1.2.5
S-1.2.3a	E-1.2.5	Waste Belt Conveyor 1	2017	2,480 tpy	New	DC 1.2.5
S-1.2.4	Fugitive	Waste Roll Crushing Mill	2017	2,480 tpy	New	--
S-1.2.7	N/A – Fully Enclosed	Waste Bucket Elevator	2017	2,480 tpy	New	Enclosed
S-1.2.8	E-1.1.8e	Waste Silo	2017	2,480 tpy	New	DC 1.1.8e
S-1.2.3b	Fugitive	Waste Belt Conveyor 2	2017	2,480 tpy	New	Partially Enclosed
S-S-Sand	Fugitive	Sand Stockpile	2017	42,638 tpy	New	--

S-1.4.1	Fugitive	Sand Feeding Hopper	2017	42,638 tpy	New	--
S-1.4.4	Fugitive	Sand Belt Conveyor	2017	42,638 tpy	New	--
S-1.4.7	Fugitive	Ball Mill	2017	45,119 tpy	New	--
S-1.4.10	N/A – Fully Enclosed	Sand and Waste Mixer	2017	45,119 tpy	New	Enclosed
S-1.3.1	E-1.3.2	Fly Ash Powder Silo	2017	45,579 tpy	New	DC 1.3.2
S-1.3.6	N/A – Fully Enclosed	Fly Ash Metering Scale with Spiral Governor	2017	45,579 tpy	New	Enclosed
S-1.3.9	Fugitive	Fly Ash Slurry Mixer	2017	45,579 tpy	New	--
S-DH-Ash	E-1.3.7	Fly Ash Discharge Hopper	2017	45,579 tpy	New	DC 1.3.7
S-Boiler	E-Boiler	Natural gas-fired boiler	2017	15.7 MMBtu/hr	New	N/A
S-ENGEN	E-ENGEN	Emergency generator	2017	2,220 HP	New	N/A

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J: EMISSIONS POINTS DATA SUMMARY SHEET

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3]	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)	*(Speciate VOCs & HAPS)*	lb/hr	ton/yr	lb/hr	ton/yr			
E-1.1.8a	Upward Vertical Stack	S-1.1.1	Lime Silo	DC 1.1.8a	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	2.39 1.54 1.23	8.05 5.18 4.15	0.22 0.22 0.17	0.74 0.74 0.59	Solid (PM)	A, H	
E-1.1.8b	Upward Vertical Stack	S-1.1.2	Gypsum Silo	DC 1.1.8b	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	0.24 0.15 0.12	0.81 0.52 0.41	0.22 0.22 0.17	0.74 0.74 0.59	Solid (PM)	A, H	
E-1.1.8c	Upward Vertical Stack	S-1.1.3a	Cement Silo 1	DC 1.1.8c	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	0.80 0.51 0.41	2.68 1.73 1.38	0.22 0.22 0.17	0.74 0.74 0.59	Solid (PM)	A, H	
E-1.1.8d	Upward Vertical Stack	S-1.1.3b	Cement Silo 2	DC 1.1.8d	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	0.80 0.51 0.41	2.68 1.73 1.38	0.22 0.22 0.17	0.74 0.74 0.59	Solid (PM)	A, H	
E-1.2.5	Upward Vertical Stack	S-1.2.2 and S-1.2.3a	Waste Jaw Crusher and Belt Conveyor 1	DC 1.2.5	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	0.37 0.37 0.30	1.26 1.26 1.01	0.37 0.37 0.30	1.26 1.26 1.01	Solid (PM)	B, C, H	
E-1.1.8e	Upward Vertical Stack	S-1.2.8	Waste Silo	DC 1.1.8e	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	0.22 0.22 0.17	0.74 0.74 0.59	0.22 0.22 0.17	0.74 0.74 0.59	Solid (PM)	B, H	
E-1.3.2	Upward Vertical Stack	S-1.3.1	Fly Ash Powder Silo	DC 1.3.2	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	0.22 0.22 0.17	0.74 0.74 0.59	0.22 0.22 0.17	0.74 0.74 0.59	Solid (PM)	C, H	
E-1.3.7	Upward Vertical Stack	S-DH-Ash	Fly Ash Discharge Hopper	DC 1.3.7	Dust Collector	NA	NA	PM PM_{10} $PM_{2.5}$	0.37 0.37 0.30	1.26 1.26 1.01	0.37 0.37 0.30	1.26 1.26 1.01	Solid (PM)	B, H	
E-Boiler	Upward Vertical Stack	S-Boiler	Natural gas-fired boiler	NA	NA	NA	NA	NO_X CO VOC SO_2 PM Filterable $PM_{10}/PM_{2.5}$	1.5 1.3 0.1 0.01 0.1 0.03 0.03	5.20 4.36 0.29 0.10 0.39 0.10 0.10	1.5 1.3 0.1 0.01 0.1 0.03 0.03	5.20 4.36 0.29 0.10 0.39 0.10 0.10	Solid (PM) Gas/Vapor (other)	F	

E-ENGEN	Upward Vertical Stack	S-ENGEN	Emergency generator	NA	NA	NA	NA	NO_X CO VOC SO_2 PM PM_{10} $PM_{2.5}$	23.96 4.40 0.47 0.04 0.13 0.13 0.13	5.99 1.10 0.12 0.01 0.03 0.03 0.03	23.96 4.40 0.47 0.04 0.13 0.13 0.13	5.99 1.10 0.12 0.01 0.03 0.03 0.03	Solid (PM) Gas/Vapor (other)	F, G	

A- AP-42 Table 11.12-2
B- AP 42 Section 13.2.4
C- AP-42 Table 11.19.2-2
D- AP-42 Table 11.6-4
E- AP 42 Section 1.4
F- AP 42 Section 3.3
G- Vendor Data
H- Dust collector grain loadings

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^{o}F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
E-1.1.8a	~ 1	Ambient	2,060	44	290	~33	4368402.84	676281.62
E-1.1.8b	~ 1	Ambient	2,060	44	290	~33	4368402.84	676281.62
E-1.1.8c	~ 1	Ambient	2,060	44	290	~33	4368402.84	676281.62
E-1.1.8d	~ 1	Ambient	2,060	44	290	~33	4368402.84	676281.62
E-1.2.5	~ 1	Ambient	3,531	75	290	~10	4368402.84	676281.62
E-1.1.8e	~ 1	Ambient	2,060	44	290	~33	4368402.84	676281.62
E-1.3.2	~ 1	Ambient	2,060	44	290	~33	4368402.84	676281.62
E-1.3.7	~ 1	Ambient	3,531	75	290	~10	4368402.84	676281.62
E-Boiler	TBD	TBD	TBD	TBD	290	TBD	4368402.84	676281.62
E-ENGEN	TBD	937	11,734	TBD	290	TBD	4368402.84	676281.62

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K: FUGITIVE EMISSIONS DATA SUMMARY SHEET

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☒ Yes ☐ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☐ Yes ☒ No ☐ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☒ Yes ☐ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	PM PM_{10} $PM_{2.5}$	0.20 0.04 0.01	0.89 0.18 0.04	0.20 0.04 0.01	0.89 0.18 0.04	O[A]
Unpaved Haul Roads	PM PM_{10} $PM_{2.5}$	0.51 0.14 0.01	2.23 0.61 0.06	0.51 0.14 0.01	2.23 0.61 0.06	O[B]
Storage Pile Emissions	PM PM_{10} $PM_{2.5}$	0.01 0.01 <0.01	0.05 0.03 <0.01	0.01 <0.01 <0.01	0.03 0.01 <0.01	O[C]
Loading/Unloading Operations	N/A	---	---	---	---	---
Wastewater Treatment Evaporation & Operations	N/A	---	---	---	---	---
Equipment Leaks	N/A	---	---	---	---	---
General Clean-up VOC Emissions	N/A	---	---	---	---	---
Other (Material handling activities)	PM PM_{10} $PM_{2.5}$	Varies based on unit	0.38 0.32 0.26	Varies based on unit	0.38 0.32 0.26	O[D]

A - AP 42 13.2.1
B - AP 42 13.2.2
C - AP 42 13.2.5
D – AP 42 11.12-2, 13.2.4, 11.19.2-2, 11.6-4

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): S-BOILER

1. Name or type and model of proposed affected source: Natural gas-fired boiler (15.7 MMBtu/hr)
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: NA
4. Name(s) and maximum amount of proposed material(s) produced per hour: Does not produce any materials.
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: External combustion of natural gas.

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural gas - 15,397 scf/hr

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natural gas with negligble sulfur and ash content

(c) Theoretical combustion air requirement (ACF/unit of fuel):

TBD @ °F and psia.

(d) Percent excess air: TBD

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

One (1) 15.7 MMBtu/hr, natural gas fired external combustion boiler

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: 15.7 $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	22.5	Days/Week	6	Weeks/Year	43

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ °F and psia

a.	NO_X	1.5	lb/hr	grains/ACF
b.	SO_2	0.01	lb/hr	grains/ACF
c.	CO	1.3	lb/hr	grains/ACF
d.	PM_{10}	0.12	lb/hr	grains/ACF
e.	Hydrocarbons	N/A	lb/hr	grains/ACF
f.	VOCs	0.1	lb/hr	grains/ACF
g.	Pb	7.7 x 10-6	lb/hr	grains/ACF
h.	Specify other(s)			
		See Emission Calculations in Attachment N	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None.	Monthly records of natural gas consumed
REPORTING	**TESTING**
None.	None.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
N/A

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.
Identification Number (as assigned on *Equipment List Form*):

1. Name or type and model of proposed affected source: Diesel-fired emergency generator
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: NA
4. Name(s) and maximum amount of proposed material(s) produced per hour: Does not produce any materials.
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: Internal combustion of diesel.

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Diesel – 108 gal/hr

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Ultra low sulfur diesel

(c) Theoretical combustion air requirement (ACF/unit of fuel):

TBD @ °F and psia.

(d) Percent excess air: TBD

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

15.12 MMBtu/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: 15.12 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	0.5	Days/Week	1	Weeks/Year	43

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 937 °F and psia

a.	NO_X	23.96	lb/hr	grains/ACF
b.	SO_2	0.04	lb/hr	grains/ACF
c.	CO	4.40	lb/hr	grains/ACF
d.	PM_{10}	0.13	lb/hr	grains/ACF
e.	Hydrocarbons	N/A	lb/hr	grains/ACF
f.	VOCs	0.47	lb/hr	grains/ACF
g.	Pb	0.0	lb/hr	grains/ACF
h.	Specify other(s)			
		See Emission Calculations in Attachment N	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Hours of operation.	Hours of operation, engine maintenance.
REPORTING	**TESTING**
None.	None.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
None

Attachment L
FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

UNPAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle size multiplier	4.9	1.5
s =	Silt content of road surface material (%)	7.1	7.1
p =	Number of days per year with precipitation >0.01 in.	150	150

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Sand Delivery	Varies	27.5	15	0.19	1	1,547	NA	NA
2	Lime Delivery	Varies	27.5	15	0.19	1	800	NA	NA
3	Gypsum Delivery	Varies	27.5	15	0.19	1	80	NA	NA
4	Cement Delivery	Varies	27.5	15	0.19	1	267	NA	NA
5	Fly Ash Delivery	Varies	27.5	15	0.19	1	1,654	NA	NA
6									
7									
8									

Source: *AP-42 Fifth Edition – 13.2.2 Unpaved Roads*

$E = k \times 5.9 \times (s \div 12) \times (S \div 30) \times (W \div 3)^{0.7} \times (w \div 4)^{0.5} \times ((365 - p) \div 365) =$ lb/Vehicle Mile Traveled (VMT)

Where:

		PM	PM-10
k =	Particle size multiplier	4.9	1.5
s =	Silt content of road surface material (%)	7.1	7.1
S =	Mean vehicle speed (mph)	15	15
W =	Mean vehicle weight (tons)	27.5	27.5
w =	Mean number of wheels per vehicle	Varies	Varies
p =	Number of days per year with precipitation >0.01 in.	150	150

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1	1.03	0.79	1.03	0.79	0.28	0.22	0.28	0.22
2	1.03	0.41	1.03	0.41	0.28	0.11	0.28	0.11
3	1.03	0.04	1.03	0.04	0.28	0.01	0.28	0.01
4	1.03	0.14	1.03	0.14	0.28	0.04	0.28	0.04
5	1.03	0.85	1.03	0.85	0.28	0.23	0.28	0.023
TOTALS	5.13	2.23	5.13	2.23	1.41	0.40	1.41	0.40

FUGITIVE EMISSIONS FROM PAVED HAULROADS

INDUSTRIAL PAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

I =	Industrial augmentation factor (dimensionless)	**See Attachment N for detailed calculations from**
n =	Number of traffic lanes	**Paved roadways.**
s =	Surface material silt content (%)	
L =	Surface dust loading (lb/mile)	

Item Number	Description	Mean Vehicle Weight (tons)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1	Sales Road	27.5	0.19	1	3,369	NA	NA
2							
3							
4							
5							
6							
7							
8							

Source: *AP-42 Fifth Edition – 11.2.6 Industrial Paved Roads*

$E = 0.077 \times I \times (4 \div n) \times (s \div 10) \times (L \div 1000) \times (W \div 3)^{0.7}$ = lb/Vehicle Mile Traveled (VMT)

Where:

I =	Industrial augmentation factor (dimensionless)	**See Attachment N for detailed calculations from**
n =	Number of traffic lanes	**Paved roadways.**
s =	Surface meterial silt content (%)	
L =	Surface dust loading (lb/mile)	
W =	Average vehicle weight (tons)	

For lb/hr: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb ÷ VMT] × [VMT ÷ trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF PAVED HAULROAD EMISSIONS

Item No.	Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY
1	0.53	0.89	0.53	0.89
2				
3				
4				
5				
6				
7				
8				
TOTALS	0.53	0.89	0.53	0.89

Attachment L
Emission Unit Data Sheet
(NONMETALLIC MINERALS PROCESSING)

Control Device ID No. (must match List Form): Outside NSPS OOO Fugitive Sources – Material Handling

Equipment Information

1. Plant Type:
   - ☐ Hot-mix asphalt facility that reduces the size of nonmetallic minerals embedded in recycled asphalt pavement
   - ☐ Plant without crushers or grinding mills and containing a stand-alone screening operation
   - ☐ Sand and gravel plant ☐ Common clay plant
   - ☐ Crushed stone plant ☐ Pumice plant
   - ☒ Other, specify Autoclave Aerated Concrete (AAC) block manufacturing

2. Plant Style: ☒ Fixed Plant ☐ Portable Plant

3. Plant Capacity: ~16-32 tons/hr

4. Underground mine: ☐ Yes ☒ No

5. Storage: ☒ Open ☐ Enclosed

6.

Emission Facility Type	Equipment Type Used	ID Number of Emission Unit	Manufacturer	Model Number/ Serial Number	Date of Manufacture
Conveyors	**See Attachment I for Emission Unit IDs and Descriptions**				
Crusher					
Secondary Crushers					
Tertiary Crushers					
Grinder					
Hoppers					
Rock Drills					
Screens					
Enclosed Storage					
Other					
Other					
Other					

Emission Facility Type	Operation Rate Design Ton/hr	Operation Rate Design Ton/hr	Annual Production Tons/year	Number of Units	Air Pollution Control Device Used
Conveyors	**See Attachment I for Emission Unit IDs and Descriptions**				
Crusher					
Secondary Crushers					
Tertiary Crushers					
Grinder					
Hoppers					
Rock Drills					
Screens					
Enclosed Storage					
Other					
Other					
Other					

7. Provide a diagram and/or schematic that shows the proposed process of the operation or plant. The diagram and/or schematic is to show all sources, components and facets of the operation or plant in an understandable line sequence of the operation. The diagram should include all the equipment involved in the operation; such as conveyors, transfer points, stockpiles, crushers, facilities, vents, screens, truck dump bins, truck, barge and railcar loading and unloading, etc. Appropriate sizing and specifications of equipment should be included in the diagram. The diagram shall logical follow the entire process load-in to load-out.

8. Roads

	Paved Miles of Road	Unpaved Miles of Road	Watered		Other Control (Specify)
			Miles	Frequency	
Plant Yard	**See Attachment L for Haul Roads Information**				
Access Roads					

9. Vehicle Type

Vehicle Type	Mean Vehicle Speed in mph	Mean Vehicle Weight in Tons		Number of Wheels	Distance Traveled per Round Trip	
		Empty	Full		Paved Feet or Miles	Unpaved Feet or Miles
Raw Aggregate	**See Attachment L for Haul Roads Information**					
Loaders						
Product Trucks						
Other						
Other						
Other						
Other						

10. Describe all proposed materials storage facilities associated with the **Emission Units** listed.
Lime, Gypsum, Cement, Sand, Fly Ash and Waste.

ID of Emission Unit	S-1.1.1	S-1.1.2	S-1.1.3a	S-1.1.3b	S-1.2.8
Type Storage	Silo	Silo	Silo	Silo	Silo
Material Stored	Lime	Gypsum	Cement	Cement	Waste
Typical Moisture Content (%)	0.7%	0.24%	0.07%	0.07%	>5%
Avg % of material passing through 200 mesh sieve	Unknown	Unknown	Unknown	Unknown	Unknown
Maximum Total Yearly Throughput in storage (tons)	22,054 tpy	2,206 tpy	7,351 tpy	7,351 tpy	2,480 tpy
Maximum Stockpile Base Area (ft^2)	N/A	N/A	N/A	N/A	N/A
Maximum Stockpile height (ft)	N/A	N/A	N/A	N/A	N/A
Dust control method applied to storage	DC 1.1.8a	DC 1.1.8b	DC 1.1.8c	DC 1.1.8d	DC 1.1.8e
Method of material load-in to bin or stockpile	Pneumatic Conveyor	Pneumatic Conveyor	Pneumatic Conveyor	Pneumatic Conveyor	Pneumatic Conveyor
Dust control method applied during load-in	Yes	Yes	Yes	Yes	Yes
Method of material load-out to bin or stockpile	Drop	Drop	Drop	Drop	Drop
Dust control method applied during load-out	Yes	Yes	Yes	Yes	Yes

Storagepiles	Estimated Annual Tons	Turnover Rate (Ton/Month)	Wetted as Piled	Number of Sides Enclosed
Coarse: over 1" **(Waste)**	2,480 tpy	210 tpm	No	0
Fine: 1" to ¼"				
¼" and less **(Sand)**	42,638 tpy	3,553 tpm	No	0
MFG. Sand				
Other, specify				

Conveying and Transfer

Describe the conveying system including transfer points associated with proposed Emission Units (crushers, etc…).

Conveying systems include, but are not limited to, belt conveyors, screw conveyors, bucket elevator etc. Please refer to PFD (Attachment F) for detail description of the process. Also, refer to Attachment I for proposed Emission units for each equipment.

Describe any methods of emission control to be used with these proposed conveying systems:

Controls include, but are not limited to, dust collectors, enclosures, etc.

ID of Emission Unit	Type Conveyor or Transfer Point	Material Handled [Note nominal size of material transferred (e.g. ¾” × 0)]	Material Conveying or Transfer Rate		Dust Control Measures Applied	Approximate Material Moisture Content (%)
			Max. TPH	Maximum TPY		
See Detail Emission Calculations (Attachment N)						

Crushing and Screening

ID of Emission Unit	S-1.2.2					
Type Crusher or Screen	Waste Jaw Crusher					
Material Sized	Max ~1 ft					
Material Sized Throughput:						
Tons/hr	10~50 tph					
Tons/yr	2,480 tpy					
Material sized from/to	NA					
Typical moisture content as crushed or screened (%)	>5%					
Dust control methods applied	DC 1.2.5					
Stack Parameters:						
Height (ft)	~10					
Diameter (ft)	~1					
Volume (ACFM)	3,531					
Temp (°F)	212					
Maximum operating schedule:						
Hour/day	22.5					
Day/year	300					
Hour/year	8760					
Approximate Percentage of Operation from:						
Jan – Mar	25%					
April – June	25%					
July – Sept	25%					
Oct – Dec	25%					
Maximum Particulate Emissions:						
LB/HR	0.37					
Ton/Year	1.26					

List emission sources with request information:

ID of Emission Unit	Type of Emission Unit and Use	Operating Schedule		Max. Amount of Stone Input to Emission (lb/hr)	Crushed or Screened From/To (size)	Date of Emission Unit was Manufacture
		Actual (hrs/yr)	Design (hrs/yr)			
Not Applicable						

List emission sources with request information:

ID of Emission Unit	Maximum expected emissions from Emission Unit without Air Pollution Control Equipment				
	PM_{10} (lbs/hr)	**SO_2** (lbs/hr)	**CO** (lbs/hr)	**NO_x** (lbs/hr)	**VOC** (lbs/hr)
Not Applicable					

ID of Emission Unit	Maximum expected emissions from Emission Unit without Air Pollution Control Equipment				
	PM_{10} (tons/yr)	**SO_2** (tons/yr)	**CO** (tons/yr)	**NO_x** (tons/yr)	**VOC** (tons/yr)
Not Applicable					

Please fill out a separate Air Pollution Control Device Sheet for each Emission Unit equipped with an air pollution control system.

What type of stone will be quarried at this site?

No stone will be quarried.

How will it be quarried?

- ☐ Sawing
- ☐ Blasting
- ☐ Other, Specify: N/A

If blasting is checked, complete the following: N/A

- ☐ Frequency of blasting:
- ☐ What method of air pollution control will be employed during drilling and blasting?

ATTACHMENT M: AIR POLLUTION CONTROL DEVICE SHEETS

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC 1.1.8a, DC 1.1.8b, DC 1.1.8c, DC 1.1.8d, DC 1.1.8e

Equipment Information and Filter Characteristics

1. Manufacturer: TBD
   Model No. DMC-48
2. Total number of compartments: 48
3. Number of compartment online for normal operation:
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☐ Open Pressure
   - ☒ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☐ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight oz./sq.yd
   - ☐ Teflon Thickness in
   - ☒ Others, specify Anti-static repellent oil polyester fiber needled felt
7. Bag Dimension:
   - Diameter 4.70 in.
   - Length 6.50 ft.
8. Total cloth area: 390 ft^2
9. Number of bags: 48
10. Operating air to cloth ratio: 5.3 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☐ Reverse Air Jet
    - ☒ Other: Will use a motor to drive a connecting rod to clean the surface of the bags
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 22.5 Max. per yr: 6,750
15. Collection efficiency: Rating: 99.99 % Guaranteed minimum: %

Gas Stream Characteristics

16. Gas flow rate into the collector: 2,060 ACFM at <212 °F and PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air
18. Gas Stream Temperature: <212 °F
19. Fan Requirements: 3 kW OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High TBD in. H_2O Low TBD in. H_2O
21. Particulate Loading: Inlet: Varies grain/scf Outlet: 0.013 grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Particulate Matter

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

	IN		OUT	
Pollutant	**lb/hr**	**grains/acf**	**lb/hr**	**grains/acf**
Particulate Matter	Varies	Varies	0.22	0.012

25. Complete the table:

	Particle Size Distribution at Inlet to Collector	**Fraction Efficiency of Collector**
Particulate Size Range (microns)	**Weight % for Size Range**	**Weight % for Size Range**
0 – 2	Information not available	99.99
2 – 4		99.99
4 – 6		99.99
6 – 8		99.99
8 – 10		99.99
10 – 12		99.99
12 – 16		99.99
16 – 20		99.99
20 – 30		99.99
30 – 40		99.99
40 – 50		99.99
50 – 60		99.99
60 – 70		99.99
70 – 80		99.99
80 – 90		99.99
90 – 100		99.99
>100		99.99

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: TBD

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Dust cleaning device will use a motor to drive a connecting rod to clean the surface of bags.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 100%

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
None

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC 1.2.5

Equipment Information and Filter Characteristics

1. Manufacturer: TBD
   Model No. DMC-80
2. Total number of compartments: 80
3. Number of compartment online for normal operation:
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☐ Open Pressure
   - ☒ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☐ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight oz./sq.yd
   - ☐ Teflon Thickness in
   - ☒ Others, specify Anti-static repellent oil polyester fiber needled felt
7. Bag Dimension:
   - Diameter 4.70 in.
   - Length 6.50 ft.
8. Total cloth area: 650 ft^2
9. Number of bags: 80
10. Operating air to cloth ratio: 5.4 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☐ Reverse Air Jet
    - ☒ Other: Will use a motor to drive a connecting rod to clean the surface of the bags
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 22.5 Max. per yr: 6,750
15. Collection efficiency: Rating: 99.99 % Guaranteed minimum: %

Gas Stream Characteristics

16. Gas flow rate into the collector: 3,531 ACFM at <212 °F and PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: Ambient lb. Water/lb. Dry Air
18. Gas Stream Temperature: <212 °F
19. Fan Requirements: 5.5 kW OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High TBD in. H_2O Low TBD in. H_2O
21. Particulate Loading: Inlet: Varies grain/scf Outlet: 0.013 grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Particulate Matter

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

	IN		OUT	
Pollutant	**lb/hr**	**grains/acf**	**lb/hr**	**grains/acf**
Particulate Matter	Varies	Varies	0.37	0.012

25. Complete the table:

	Particle Size Distribution at Inlet to Collector	**Fraction Efficiency of Collector**
Particulate Size Range (microns)	**Weight % for Size Range**	**Weight % for Size Range**
0 – 2	Information not available	99.99
2 – 4		99.99
4 – 6		99.99
6 – 8		99.99
8 – 10		99.99
10 – 12		99.99
12 – 16		99.99
16 – 20		99.99
20 – 30		99.99
30 – 40		99.99
40 – 50		99.99
50 – 60		99.99
60 – 70		99.99
70 – 80		99.99
80 – 90		99.99
90 – 100		99.99
>100		99.99

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: TBD

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Dust cleaning device will use a motor to drive a connecting rod to clean the surface of bags.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 100%

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
None

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC 1.3.2

Equipment Information and Filter Characteristics

1. Manufacturer: TBD
   Model No. DMC-48
2. Total number of compartments: 48
3. Number of compartment online for normal operation:
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☐ Open Pressure
   - ☒ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☐ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight oz./sq.yd
   - ☐ Teflon Thickness in
   - ☒ Others, specify Anti-static repellent oil polyester fiber needled felt
7. Bag Dimension:
   - Diameter 4.70 in.
   - Length 6.50 ft.
8. Total cloth area: 390 ft^2
9. Number of bags: 48
10. Operating air to cloth ratio: 5.3 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☐ Reverse Air Jet
    - ☒ Other: Will use a motor to drive a connecting rod to clean the surface of the bags.
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 22.5 Max. per yr: 6,750
15. Collection efficiency: Rating: 99.99 % Guaranteed minimum: %

Gas Stream Characteristics

16. Gas flow rate into the collector: 2,060 ACFM at <212 °F and PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: Ambient lb. Water/lb. Dry Air
18. Gas Stream Temperature: <212 °F
19. Fan Requirements: 3 kW OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High TBD in. H_2O Low TBD in. H_2O
21. Particulate Loading: Inlet: Varies grain/scf Outlet: 0.013 grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Particulate Matter

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

	IN		OUT	
Pollutant	**lb/hr**	**grains/acf**	**lb/hr**	**grains/acf**
Particulate Matter	Varies	Varies	0.22	0.012

25. Complete the table:

	Particle Size Distribution at Inlet to Collector	**Fraction Efficiency of Collector**
Particulate Size Range (microns)	**Weight % for Size Range**	**Weight % for Size Range**
0 – 2	Information not available	99.99
2 – 4		99.99
4 – 6		99.99
6 – 8		99.99
8 – 10		99.99
10 – 12		99.99
12 – 16		99.99
16 – 20		99.99
20 – 30		99.99
30 – 40		99.99
40 – 50		99.99
50 – 60		99.99
60 – 70		99.99
70 – 80		99.99
80 – 90		99.99
90 – 100		99.99
>100		99.99

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: TBD

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Dust cleaning device will use a motor to drive a connecting rod to clean the surface of bags.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 100%

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
None

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC 1.3.7

Equipment Information and Filter Characteristics

1. Manufacturer: TBD
   Model No. DMC-80
2. Total number of compartments: 80
3. Number of compartment online for normal operation:
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☐ Open Pressure
   - ☒ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☐ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight oz./sq.yd
   - ☐ Teflon Thickness in
   - ☒ Others, specify Anti-static repellent oil polyester fiber needled felt
7. Bag Dimension:
   - Diameter 4.70 in.
   - Length 6.50 ft.
8. Total cloth area: 650 ft^2
9. Number of bags: 80
10. Operating air to cloth ratio: 5.44 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☐ Reverse Air Jet
    - ☒ Other: Will use a motor to drive a connecting rod to clean the surface of the bags
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 22.5 Max. per yr: 6,750
15. Collection efficiency: Rating: 99.99 % Guaranteed minimum: %

Gas Stream Characteristics

16. Gas flow rate into the collector: 3,531 ACFM at <212 °F and PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: Ambient lb. Water/lb. Dry Air
18. Gas Stream Temperature: <212 °F
19. Fan Requirements: 5.5 kW OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High TBD in. H_2O Low TBD in. H_2O
21. Particulate Loading: Inlet: Varies grain/scf Outlet: 0.013 grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Particulate Matter

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

	IN		OUT	
Pollutant	**lb/hr**	**grains/acf**	**lb/hr**	**grains/acf**
Particulate Matter	Varies	Varies	0.37	0.012

25. Complete the table:

	Particle Size Distribution at Inlet to Collector	**Fraction Efficiency of Collector**
Particulate Size Range (microns)	**Weight % for Size Range**	**Weight % for Size Range**
0 – 2	Information not available	99.99
2 – 4		99.99
4 – 6		99.99
6 – 8		99.99
8 – 10		99.99
10 – 12		99.99
12 – 16		99.99
16 – 20		99.99
20 – 30		99.99
30 – 40		99.99
40 – 50		99.99
50 – 60		99.99
60 – 70		99.99
70 – 80		99.99
80 – 90		99.99
90 – 100		99.99
>100		99.99

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: TBD

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Dust cleaning device will use a motor to drive a connecting rod to clean the surface of bags.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 100%

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
PM/PM10/PM2.5 efficiency 99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
None

ATTACHMENT N: SUPPORTING EMISSIONS CALCULATIONS

Emissions Summary

Source	**NO_x (tpy)**	**CO (tpy)**	**VOC (tpy)**	**SO_2 (tpy)**	**CO_2e (tpy)**	**PM (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
Material Handling	--	--	--	--	--	0.38	0.32	0.26
Dust Collectors	--	--	--	--	--	6.94	6.94	5.55
Piles	--	--	--	--	--	0.03	0.01	0.00
Roads	--	--	--	--	--	3.12	0.79	0.11
Emergency Generator	5.99	1.10	0.12	0.01	618	0.03	0.03	0.03
Boiler	5.20	4.36	0.29	0.03	6,207	0.39	0.39	0.39
Total	11.19	5.47	0.40	0.04	6,825	10.89	8.49	6.34

Emergency Generator - Potential to Emit Calculations

Operating Information

Parameter	Value	Units	Source/Basis
Make/Model	Cummins Inc QSK50-G5 NR2		
Fuel	Diesel		
Engine Type	Compression Ignition		
Control Device	N/A		
Unit Rating	2,220	hp	
Fuel consumption	108	gal/hr	
Maximum Heat Input Rating	15.12	MMBtu/hr	
Fuel High Heat Value	140,000	Btu/gal	
Hours of Operation	500	hrs/yr	
Number of Units	1	count	

Potential Emissions of Criteria and GHG Pollutants

Pollutant	Emission Factor	Units	Source/Basis	Emissions per Unit (lb/hr)	Emissions per Unit (tpy)
NO_X	11.8326	kg/hr	Manufacturer Specifications	23.96	5.99
CO	2.1756	kg/hr	Manufacturer Specifications	4.40	1.10
SO_2	0.0222	kg/hr	Manufacturer Specifications	0.04	0.01
PM	0.0666	kg/hr	Manufacturer Specifications	0.13	0.03
VOC	0.2331	kg/hr	Manufacturer Specifications	0.47	0.12
CO_2	73.96	kg/MMBtu	40 CFR 98 Table C-1	2,465.4	616.3
CH_4	0.003	kg/MMBtu	40 CFR 98 Table C-2	0.100	0.03
N_2O	0.0006	kg/MMBtu	40 CFR 98 Table C-2	0.0200	0.005
CO_2e	--	--	GWPs from 40 CFR 98 Table A-1	2,473.8	618.5

Emergency Generator - Potential to Emit Calculations

Potential Emissions of Hazardous Air Pollutants

Pollutant	Emission Factor	Units	Source/Basis	Emissions per Unit (lb/hr)	(tpy)
Acetaldehyde	7.67E-04	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	1.16E-02	2.90E-03
Acrolein	9.25E-05	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	1.40E-03	3.50E-04
Acenaphthylene	5.06E-06	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	7.65E-05	1.91E-05
Acenaphthene	1.42E-06	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	2.15E-05	5.37E-06
Anthracene	1.87E-06	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	2.83E-05	7.07E-06
Benzene	9.33E-04	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	1.41E-02	3.53E-03
Benzo(a)anthracene	1.68E-06	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	2.54E-05	6.35E-06
Benzo(b)fluoranthene	9.91E-08	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	1.50E-06	3.75E-07
Benzo(k)fluoranthene	1.55E-07	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	2.34E-06	5.86E-07
Benzo(a)pyrene	1.88E-07	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	2.84E-06	7.11E-07
Benzo(g,h,I)perylene	4.89E-07	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	7.39E-06	1.85E-06
Butadiene (1,3-)	3.91E-05	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	5.91E-04	1.48E-04
Chrysene	3.53E-07	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	5.34E-06	1.33E-06
Dibenz(a,h)anthracene	5.83E-07	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	8.81E-06	2.20E-06
Formaldehyde	1.18E-03	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	1.78E-02	4.46E-03
Fluorene	2.92E-05	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	4.42E-04	1.10E-04
Indeno(1,2,3-cd)pyrene	3.75E-07	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	5.67E-06	1.42E-06
Naphthalene	8.48E-05	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	1.28E-03	3.21E-04
Propylene	2.58E-03	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	3.90E-02	9.75E-03
Phenanthrene	2.94E-05	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	4.45E-04	1.11E-04
Pyrene	4.78E-06	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	7.23E-05	1.81E-05
Toluene	4.09E-04	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	6.18E-03	1.55E-03
Xylenes	2.85E-04	lb/MMBtu	Table 3.3-2 of AP-42 (July 2000)	4.31E-03	1.08E-03
TOTAL HAPs				0.10	0.024

Boiler - Potential to Emit Calculations

Operating Information

Parameter	Value	Units	Source/Basis
Make/ Model	WNS6-1.6-Y/Q		Project Equipment Catalog[1]
Normal Operating Load	100%		
Fuel	Natural Gas		
Fuel Higher Heating Value (HHV)	1,020	Btu/scf	AP-42 Default
Unit Rating	15.7	MMBtu/hr	Calculated based on fuel consumption and default high heat value for natural gas.
Fuel Consumption	436	m^3/hr	Project Equipment Catalog[1]
Fuel Consumption	15,397	scfh	Conversion from m^3/hr to scfh
Hours of Operation	6,750	hrs/yr	Brief Introduction of Technological Design of Daily Output 400 Cubic Meters AAC Block Production Line to be Set Up in U.S.A.
Number of Units	1	count	

Potential Emissions of Criteria and GHG Pollutants

Pollutant	Emission Factor	Units	Source/Basis	Emissions per Unit (lb/hr)	Emissions per Unit (tpy)
NO_X	100	lb/MMscf	Table 1.4-1 of AP-42	1.5	5.20
CO	84	lb/MMscf	Table 1.4-1 of AP-42	1.3	4.36
SO_2	0.6	lb/MMscf	Table 1.4-2 of AP-42	0.01	0.03
PM_{10} Filterable	1.9	lb/MMscf	Table 1.4-2 of AP-42; PM Filterable = PM_{10} Filterable = $PM_{2.5}$ Filterable	0.03	0.10
$PM_{2.5}$ Filterable	1.9	lb/MMscf	Table 1.4-2 of AP-42; PM Filterable = PM_{10} Filterable = $PM_{2.5}$ Filterable	0.03	0.10
PM Filterable	1.9	lb/MMscf	Table 1.4-2 of AP-42; PM Filterable = PM_{10} Filterable = $PM_{2.5}$ Filterable	0.03	0.10
PM Condensable	5.7	lb/MMscf	Table 1.4-2 of AP-42	0.09	0.30
PM Total	7.6	lb/MMscf	Table 1.4-2 of AP-42	0.12	0.39
VOC	5.5	lb/MMscf	Table 1.4-2 of AP-42	0.08	0.29
CO_2	53.06	kg/MMBtu	40 CFR 98 Table C-1	1,837	6,200
CH_4	0.001	kg/MMBtu	40 CFR 98 Table C-2	0.0	0.1
N_2O	0.0001	kg/MMBtu	40 CFR 98 Table C-2	0.00	0.0
CO_2e	--	--	GWPs from 40 CFR 98 Table A-1	1,839	6,207

Boiler - Potential to Emit Calculations

Potential Emissions of Hazardous Air Pollutants

Pollutant	Emission Factor	Units	Source/Basis	Emissions per Unit (lb/hr)	(tpy)
2-Methylnaphthalene	2.40E-05	lb/MMscf	AP-42 Table 1.4-3	3.70E-07	1.25E-06
3-Methylchloranthrene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	AP-42 Table 1.4-3	2.46E-07	8.31E-07
Acenaphthene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
Acenaphthylene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
Anthracene	2.40E-06	lb/MMscf	AP-42 Table 1.4-3	3.70E-08	1.25E-07
Arsenic	2.00E-04	lb/MMscf	AP-42 Table 1.4-4	3.08E-06	1.04E-05
Benz(a)anthracene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
Benzene	2.10E-03	lb/MMscf	AP-42 Table 1.4-3	3.23E-05	1.09E-04
Benzo(a)pyrene	1.20E-06	lb/MMscf	AP-42 Table 1.4-3	1.85E-08	6.24E-08
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	AP-42 Table 1.4-3	1.85E-08	6.24E-08
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
Beryllium	1.20E-05	lb/MMscf	AP-42 Table 1.4-4	1.85E-07	6.24E-07
Cadmium	1.10E-03	lb/MMscf	AP-42 Table 1.4-4	1.69E-05	5.72E-05
Chromium	1.40E-03	lb/MMscf	AP-42 Table 1.4-4	2.16E-05	7.27E-05
Chrysene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
Cobalt	8.40E-05	lb/MMscf	AP-42 Table 1.4-4	1.29E-06	4.36E-06
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	AP-42 Table 1.4-3	1.85E-08	6.24E-08
Dichlorobenzene	1.20E-03	lb/MMscf	AP-42 Table 1.4-3	1.85E-05	6.24E-05
Fluoranthene	3.00E-06	lb/MMscf	AP-42 Table 1.4-3	4.62E-08	1.56E-07
Fluorene	2.80E-06	lb/MMscf	AP-42 Table 1.4-3	4.31E-08	1.45E-07
Formaldehyde	7.50E-02	lb/MMscf	AP-42 Table 1.4-3	1.15E-03	3.90E-03
Hexane	1.80E+00	lb/MMscf	AP-42 Table 1.4-3	2.77E-02	9.35E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	lb/MMscf	AP-42 Table 1.4-3	2.77E-08	9.35E-08
Lead	0.0005	lb/MMscf	AP-42 Table 1.4-2	7.70E-06	2.60E-05
Manganese	3.80E-04	lb/MMscf	AP-42 Table 1.4-4	5.85E-06	1.97E-05
Mercury	2.60E-04	lb/MMscf	AP-42 Table 1.4-4	4.00E-06	1.35E-05
Naphthalene	6.10E-04	lb/MMscf	AP-42 Table 1.4-3	9.39E-06	3.17E-05
Nickel	2.10E-03	lb/MMscf	AP-42 Table 1.4-4	3.23E-05	1.09E-04
Phenanathrene	1.70E-05	lb/MMscf	AP-42 Table 1.4-3	2.62E-07	8.83E-07
Pyrene	5.00E-06	lb/MMscf	AP-42 Table 1.4-3	7.70E-08	2.60E-07
Selenium	2.40E-05	lb/MMscf	AP-42 Table 1.4-4	3.70E-07	1.25E-06
Toluene	3.40E-03	lb/MMscf	AP-42 Table 1.4-3	5.23E-05	1.77E-04
TOTAL HAPs				0.03	0.1

Emission Factors

Emission Source Type	PM (lb/ton)	PM_{10} (lb/ton)	$PM_{2.5}$ (lb/ton)	PM_{cond} (lb/ton)	Source of Emission Factor
Raw mill with Fabric Filter	0.012	1.20E-02	9.60E-03	0.00E+00	AP-42 Table 11.6-4, Raw Mill Feed Belt, Fabric Filter, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Raw Mill Feed Belt with Fabric Filter	3.10E-03	3.10E-03	2.48E-03	0.00E+00	AP-42 Table 11.6-4, Raw Mill Feed Belt, Fabric Filter, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Raw Mill Weigh Hopper with Fabric Filter	1.90E-02	1.90E-02	1.52E-02	0.00E+00	AP-42 Table 11.6-4, Raw Mill Feed Belt, Fabric Filter, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Raw Mill Air Separator with Fabric Filter	3.20E-02	3.20E-02	2.56E-02	0.00E+00	AP-42 Table 11.6-4, Raw Mill Air Separator, Fabric Filter, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Pneumatic Cement Unloading	7.30E-01	4.70E-01	3.76E-01	0.00E+00	AP-42 Table 11.12-2, Cement Unloading to Elevated Storage Silo, Uncontrolled, Assumed 80% PM_{10} is $PM_{2.5}$
Finish Mill Feed Belt with Fabric Filter	2.40E-03	2.40E-03	1.92E-03	0.00E+00	AP-42 Table 11.6-4, Finish Mill Feed Belt, Fabric Filter, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Finish Mill Air Separator with Fabric Filter	2.80E-02	2.80E-02	2.24E-02	0.00E+00	AP-42 Table 11.6-4, Finish Mill Air Separator, Fabric Filter, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Finish Mill with Fabric Filter	8.00E-03	8.00E-03	6.40E-03	0.00E+00	AP-42 Table 11.6-4, Finish Mill, Fabric Filter, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Primary Crushing	5.40E-03	2.40E-03	1.92E-03	0.00E+00	AP-42 Table 11.19.2-2, Primary Crushing, Uncontrolled, Assumed Equal to Tertiary Crushing
Primary Crushing (wet supression)	1.20E-03	5.40E-04	1.00E-04	0.00E+00	AP-42 Table 11.19.2-2, Primary Crushing, Controlled, Assumed Equal to Tertiary Crushing
Secondary Crushing	5.40E-03	2.40E-03	1.92E-03	0.00E+00	AP-42 Table 11.19.2-2, Secondary Crushing, Uncontrolled, Assumed Equal to Tertiary Crushing
Secondary Crushing (wet supression)	1.20E-03	5.40E-04	1.00E-04	0.00E+00	AP-42 Table 11.19.2-2, Secondary Crushing, Controlled, Assumed Equal to Tertiary Crushing
Tertiary Crushing	5.40E-03	2.40E-03	1.92E-03	0.00E+00	AP-42 Table 11.19.2-2, Tertiary Crushing, Uncontrolled, Assumed 80% of PM_{10} is $PM_{2.5}$
Tertiary Crushing (wet supression)	1.20E-03	5.40E-04	1.00E-04	0.00E+00	AP-42 Table 11.19.2-2, Tertiary Crushing, Controlled
Drilling in Quarry	8.00E-05	8.00E-05	6.40E-05	0.00E+00	AP-42 Table 11.19.2-2, Wet Drilling - Unfragmented Stone, Assumed PM=PM_{10} and $PM_{2.5}$ = 80% of PM_{10}
Screening	2.50E-02	8.70E-03	6.96E-03	0.00E+00	AP-42 Table 11.19.2-2, Screening, Uncontrolled, Assumed 80% of PM_{10} is $PM_{2.5}$
Screening (wet supression)	2.20E-03	7.40E-04	5.00E-05	0.00E+00	AP-42 Table 11.19.2-2, Screening, Controlled
Conveyor Transfer Point	3.00E-03	1.10E-03	8.80E-04	0.00E+00	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM_{10} is $PM_{2.5}$
Conveyor Transfer Point (wet supression)	1.40E-04	4.60E-05	1.30E-05	0.00E+00	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Controlled
Autoclave	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Per engineering design estimate, no particulate emissions anticipated.

Emission Factors for Drop Equation

$$E = k\,(0.0032)\,\frac{(U/5)^{1.3}}{(M/2)^{1.4}}$$

k =	0.74	PM - (AP-42, Section 13.2.4, for Particle Size < 30 um)
	0.35	PM_{10} - (AP-42, Section 13.2.4, for Particle Size < 10 um)
	0.053	$PM_{2.5}$ - (AP-42, Section 13.2.4, for Particle Size < 2.5 um)
M (cement) =	0.07	% - (Engineering Estimate; assumed same as Cement Kiln Dust: Kansas Department of Transportation, *Use of Cement Kiln Dust for Subgrade Stabilization*, October 2004, KS-04-3)
M (Fly Ash) =	27	% - (AP-42, Table 13.2.4-1)
M (Sand) =	8	% - (America's Best Block Technical Guidance)
M (Gypsum) =	0.24	% - (Engineering Estimate)
M (lime) =	0.7	% - (AP-42, Table 13.2.4-1; assumed crushed limestone moisture content)
M(waste product) =	8	% - (Engineering Estimate; assumed same moisture content as sand because the blocks are mostly sand or fly ash and sand has the lower moisture content)
U =	3.85	mph - (average wind speed at Cumberland Regional Airport for Oct. 2013 - Sept. 2016; data sourced from NOAA Local Climatological Data (LCD) Data Tool (http://www.ncdc.noaa.gov/cdo-web/datatools/lcd))

	Emission Factor				
Material	PM Uncontrolled (lb/ton)	PM_{10} Uncontrolled (lb/ton)	$PM_{2.5}$ Uncontrolled (lb/ton)	PM_{cond} Uncontrolled (lb/ton)	
Cement	0.1841	0.0871	0.0132	0	AP-42 Section 13.2.4 Drop Equation for Cement
Fly Ash	0.0000	0.0000	0.0000	0	AP-42 Section 13.2.4 Drop Equation for Fly Ash
Sand	0.0002	0.0001	0.0000	0	AP-42 Section 13.2.4 Drop Equation for Sand
Gypsum	0.0328	0.0155	0.0023	0	AP-42 Section 13.2.4 Drop Equation for Gypsum
Lime	0.0073	0.0035	0.0005	0	AP-42 Section 13.2.4 Drop Equation for Lime
Lime and Gypsum	0.0328	0.0155	0.0023	0	AP-42 Section 13.2.4 Drop Equation for Lime and Gypsum; assumed max emission factors between Lime and Gypsum
Waste Product	0.0002	0.0001	0.0000	0	AP-42 Section 13.2.4 Drop Equation for Waste Product

Material Throughput

General Material Throughput Information		
Description[1]	**Quantity**	**Units**
Number of moulds completed per shift:	40	moulds/shift
Max annual capacity of production line:	122280	m^3
Volume per Mould:	3.502	m^3
Density of Each Block:	625	kg/m^3
Density of sand[3]:	1602	kg/m^3
Density of fly ash slurry:	1400	kg/m^3
Density of sand slurry:	1620	kg/m^3
Operating Days per Year:	300	days/yr
Operating Hours per Day:	22.5	hrs/day

Material Throughput						
Description[1]		**Usage/m^3**	**Usage/hr**	**Usage/shift**	**Usage/day**	**Usage/yr**
Finished Product	m^3	--	18.12	135.87	407.6	122280
Waste Product	m^3	--	--	--	12	3600
Fly Ash-based Block			**Fly Ash-based Block**			
Fly Ash	short ton	0.37	6.76	50.64	151.93	45579.42
Cement	short ton	0.06	1.09	8.17	24.50	7351.31
Lime	short ton	0.15	2.72	20.43	61.27	18378.81
Gypsum	short ton	0.02	0.33	2.45	7.35	2205.72
Aluminum Powder	short ton	0.00	0.01	0.07	0.20	61.14
Water for batching	short ton	0.37	6.69	50.14	150.42	45127.47
Water for steam	short ton	0.20	3.59	26.96	80.88	24261.84
Sand-based Block			**Sand-based Block**			
Sand	short ton	0.35	6.32	47.38	142.13	42638.45
Cement	short ton	0.06	1.09	8.17	24.50	7351.31
Lime	short ton	0.18	3.26	24.50	73.51	22053.92
Gypsum	short ton	0.01	0.22	1.63	4.91	1470.48
Aluminum Powder	short ton	0.00	0.01	0.07	0.20	61.14
Water for batching	short ton	0.39	7.01	52.57	157.71	47311.15
Water for steam	short ton	0.20	3.59	26.96	80.88	24261.84
Max Product Usage			**Max Product Usage**			
Fly Ash	short ton	0.37	6.76	50.64	151.93	45579.42
Sand	short ton	0.35	6.32	47.38	142.13	42638.45
Cement	short ton	0.06	1.09	8.17	24.50	7351.31
Lime	short ton	0.18	3.26	24.50	73.51	22053.92
Gypsum	short ton	0.02	0.33	2.45	7.35	2205.72
Aluminum Powder	short ton	0.00	0.01	0.07	0.20	61.14
Water for batching	short ton	0.39	7.01	52.57	157.71	47311.15
Water for steam	short ton	0.20	3.59	26.96	80.88	24261.84
Finished Product	short ton	--	13.76	103.15	309.46	92836.93
Waste Product	short ton	--	--	--	8.27	2480.20
Lime and Gypsum[2]	short ton	0.20	3.59	26.95	80.87	24259.64

[1.] Material throughput information from process documentation provided by America's Best Block: "Brief Introduction of Technological Design of Daily Output 400 Cubic Meters AAC Block Production Line to be Set Up in U.S.A."

[2.] Summation of lime and gypsum throughput; lime and gypsum are mixed together and transferred into the Pouring Mixer.

[3.] Density of dry sand source: http://dlb.sa.edu.au/tsftfmoodle/pluginfile.php/3547/mod_resource/content/0/DensitiesTable.pdf

Material Handling Operations

Enclosure Efficiency - Partially Enclosed	50%
Enclosure Efficiency - Enclosed in Building	75%
Enclosure Efficiency - Enclosed Underground	90%
Enclosure Efficiency - Airslides, Bucket Elevators, and Screw Conveyors	100%

Equipment ID	Description	Potential Future Throughput short tpy	Dust Collectors		Spray and Building Controls		Uncontrolled Emission Factor (lb/ton of throughput)				Controlled Emission Rates (tpy)[2]		
			Dust Collector ID	Capture Efficiency	Type of Control	Control Efficiency[1]	PM_{filt}	$PM_{10-filt}$	$PM_{2.5-filt}$	Reference	PM_{filt}	$PM_{10-filt}$	$PM_{2.5-filt}$
1.1.1	Transfer from Lime truck to Lime Silo (1.1.1) via pneumatic conveyance	22,054	Dust Collector (1.1.8a)	99.9%	None	0%	7.30E-01	4.70E-01	3.76E-01	AP-42 Table 11.12-2, Cement Unloading to Elevated Storage Silo, Uncontrolled, Assumed 80% PM10 is PM2.5	0.008	0.005	0.004
1.1.2	Transfer from Gypsum truck to Gypsum Silo (1.1.2) via pneumatic conveyance	2,206	Dust Collector (1.1.8b)	99.9%	None	0%	7.30E-01	4.70E-01	3.76E-01	AP-42 Table 11.12-2, Cement Unloading to Elevated Storage Silo, Uncontrolled, Assumed 80% PM10 is PM2.5	0.001	0.001	0.000
1.1.3a	Transfer from Cement truck to Cement Silo 1 (1.1.3a) via pneumatic conveyance	7,351	Dust Collector (1.1.8c)	99.9%	None	0%	7.30E-01	4.70E-01	3.76E-01	AP-42 Table 11.12-2, Cement Unloading to Elevated Storage Silo, Uncontrolled, Assumed 80% PM10 is PM2.5	0.003	0.002	0.001
1.1.3b	Transfer from Cement truck to Cement Silo 2 (1.1.3b) via pneumatic conveyance	7,351	Dust Collector (1.1.8d)	99.9%	None	0%	7.30E-01	4.70E-01	3.76E-01	AP-42 Table 11.12-2, Cement Unloading to Elevated Storage Silo, Uncontrolled, Assumed 80% PM10 is PM2.5	0.003	0.002	0.001
1.1.3a	Transfer from Cement Silo 1 (1.1.3a) to Cement Screw Conveyor 1 (1.1.5c)	7,351	None	0.0%	Entirely Enclosed	100%	1.84E-01	8.71E-02	1.32E-02	AP-42 Section 13.2.4 Drop Equation for Cement	0.000	0.000	0.000
1.1.3b	Transfer from Cement Silo 2 (1.1.3b) to Cement Screw Conveyor 2 (1.1.5d)	7,351	None	0.0%	Entirely Enclosed	100%	1.84E-01	8.71E-02	1.32E-02	AP-42 Section 13.2.4 Drop Equation for Cement	0.000	0.000	0.000
1.1.2	Transfer from Gypsum Silo (1.1.2) to Gypsum Screw Conveyor (1.1.5b)	2,206	None	0.0%	Entirely Enclosed	100%	3.28E-02	1.55E-02	2.35E-03	AP-42 Section 13.2.4 Drop Equation for Gypsum	0.000	0.000	0.000
1.1.1	Transfer from Lime Silo (1.1.1) to Lime Screw Conveyor (1.1.5a)	22,054	None	0.0%	Entirely Enclosed	100%	7.33E-03	3.47E-03	5.25E-04	AP-42 Section 13.2.4 Drop Equation for Lime	0.000	0.000	0.000
1.1.5c	Transfer from Cement Screw Conveyor 1 (1.1.5c) to Auto-dosing scale for Cement (2.1.3)	7,351	None	0.0%	Entirely Enclosed	100%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
1.1.5d	Transfer from Cement Screw Conveyor 2 (1.1.5d) to Auto-dosing scale for Cement (2.1.3)	7,351	None	0.0%	Entirely Enclosed	100%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
1.1.5b	Transfer from Gypsum Screw Conveyor (1.1.5b) to Auto-dosing scale for Lime and Gypsum (2.1.1)	2,206	None	0.0%	Entirely Enclosed	100%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
1.1.5a	Transfer from Lime Screw Conveyor (1.1.5a) to Auto-dosing scale for Lime and Gypsum (2.1.1)	22,054	None	0.0%	Entirely Enclosed	100%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
2.1.3	Transfer from Auto-dosing scale for Cement (2.1.3) to Cement Screw Conveyor 3 (2.1.5b)	7,351	None	0.0%	Entirely Enclosed	100%	1.84E-01	8.71E-02	1.32E-02	AP-42 Section 13.2.4 Drop Equation for Cement	0.000	0.000	0.000
2.1.1	Transfer from Auto-dosing scale for Lime and Gypsum (2.1.1) to Lime and Gypsum Screw Conveyor (2.1.5a)	24,260	None	0.0%	Entirely Enclosed	100%	3.28E-02	1.55E-02	2.35E-03	AP-42 Section 13.2.4 Drop Equation for Lime and Gypsum; assumed max emission factors between Lime and Gypsum	0.000	0.000	0.000
2.1.5b	Transfer from Cement Screw Conveyor 3 (2.1.5b) to Pouring Mixer (2.1.14)	7,351	None	0.0%	Entirely Enclosed	100%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
2.1.5a	Transfer from Lime and Gypsum Screw Conveyor (2.1.5a) to Pouring Mixer (2.1.14)	24,260	None	0.0%	Entirely Enclosed	100%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000

Material Handling Operations

Enclosure Efficiency - Partially Enclosed	50%
Enclosure Efficiency - Enclosed in Building	75%
Enclosure Efficiency - Enclosed Underground	90%
Enclosure Efficiency - Airslides, Bucket Elevators, and Screw Conveyors	100%

Equipment ID	Description	Potential Future Throughput short tpy	Dust Collectors: Dust Collector ID	Dust Collectors: Capture Efficiency	Spray and Building Controls: Type of Control	Spray and Building Controls: Control Efficiency[1]	Uncontrolled Emission Factor (lb/ton of throughput): PM_{filt}	$PM_{10\text{-}filt}$	$PM_{2.5\text{-}filt}$	Reference	Controlled Emission Rates (tpy)[2]: PM_{filt}	$PM_{10\text{-}filt}$	$PM_{2.5\text{-}filt}$
2.1.18	Transfer from Electric Hoist (2.1.18) to Aluminum Mixer (2.1.10) [3]	61	None	0.0%	None	0%	--	--	--	--	--	--	--
2.1.18	Transfer from Electric Hoist (2.1.18) to Aluminum Mixer (2.1.10)	61	None	0.0%	None	0%	--	--	--	--	--	--	--
2.1.10	Transfer from Aluminum Mixer (2.1.10) to Auto-dosing scale for Aluminum (2.1.12)	61	None	0.0%	Entirely Enclosed	100%	--	--	--	--	--	--	--
2.1.10	Transfer from Aluminum Mixer (2.1.10) to Auto-dosing scale for Aluminum (2.1.12)	61	None	0.0%	Entirely Enclosed	100%	--	--	--	--	--	--	--
2.1.12	Transfer from Auto-dosing scale for Aluminum (2.1.12) to Pouring Mixer (2.1.14)	61	None	0.0%	Entirely Enclosed	100%	--	--	--	--	--	--	--
S-P-Waste	Transfer from Waste Finished Product Pile to Waste Jaw Crusher (1.2.2)	2,480	None	0.0%	None	0%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Waste Product	0.000	0.000	0.000
1.2.2	Waste Jaw Crusher (1.2.2)	2,480	Dust Collector (1.2.5)	99.9%	None	0%	5.40E-03	2.40E-03	1.92E-03	AP-42 Table 11.19.2-2, Primary Crushing, Uncontrolled, Assumed Equal to Tertiary Crushing	0.000	0.000	0.000
1.2.2	Transfer from Waste Jaw Crusher (1.2.2) to Waste Belt Conveyor 1 (1.2.3a) via Feeder Hopper	2,480	Dust Collector (1.2.5)	99.9%	Partially Enclosed	50%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Waste Product	0.000	0.000	0.000
1.2.3a	Transfer from Waste Belt Conveyor 1 (1.2.3a) to Waste Roll Crushing Mill (1.2.4)	2,480	Dust Collector (1.2.5)	99.9%	Partially Enclosed	50%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
1.2.4	Waste Roll Crushing Mill	2,480	None	0.0%	None	0%	1.20E-02	1.20E-02	9.60E-03	AP-42 Table 11.6-4, Raw Mill Feed Belt, Fabric Filter, Assumed PM=PM10 and PM2.5 = 80% of PM10	0.015	0.015	0.012
1.2.4	Transfer from Waste Roll Crushing Mill (1.2.4) to Waste Bucket Elevator (1.2.7)	2,480	None	0.0%	Entirely Enclosed	100%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Waste Product	0.000	0.000	0.000
1.2.7	Transfer from Waste Bucket Elevator (1.2.7) to Waste Silo (1.2.8)	2,480	Dust Collector (1.1.8e)	99.9%	Entirely Enclosed	100%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Waste Product	0.000	0.000	0.000
1.2.8	Transfer from Waste Silo (1.2.8) to Waste Belt Conveyor 2 (1.2.3b)	2,480	None	0.0%	Partially Enclosed	50%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Waste Product	0.000	0.000	0.000
1.2.3b	Transfer from Waste Belt Conveyor 2 (1.2.3b) to Ball Mill (1.4.7)	2,480	None	0.0%	Partially Enclosed	50%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.002	0.001	0.001
S-S-Sand	Transfer from Sand Pile to Sand Feeding Hopper (1.4.1)	42,638	None	0.0%	None	0%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Sand	0.005	0.002	0.000
1.4.1	Transfer from Sand Feeding Hopper (1.4.1) to Sand Belt Conveyor (1.4.4)	42,638	None	0.0%	None	0%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Sand	0.005	0.002	0.000
1.4.4	Transfer from Sand Belt Conveyor (1.4.4) to Ball Mill (1.4.7)	42,638	None	0.0%	None	0%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.064	0.023	0.019
1.4.7	Ball Mill[4]	45,119	None	0.0%	None	0%	1.20E-02	1.20E-02	9.60E-03	AP-42 Table 11.6-4, Raw Mill Feed Belt, Fabric Filter, Assumed PM=PM10 and PM2.5 = 80% of PM10	0.271	0.271	0.217
1.4.7	Transfer from Ball Mill (1.4.7) to Sand and Waste Mixer (1.4.10)	45,119	None	0.0%	Entirely Enclosed	100%	2.42E-04	1.14E-04	1.73E-05	AP-42 Section 13.2.4 Drop Equation for Sand	0.000	0.000	0.000
1.3.1	Transfer from Fly Ash Truck to Fly Ash Powder Silo (1.3.1)	45,579	Dust Collector (1.3.2)	99.9%	None	0%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
1.3.1	Transfer from Fly Ash Powder Silo (1.3.1) to Fly Ash Metering Scale with Spiral Governor (1.3.6)	45,579	None	0.0%	Entirely Enclosed	100%	4.41E-05	2.09E-05	3.16E-06	AP-42 Section 13.2.4 Drop Equation for Fly Ash	0.000	0.000	0.000

Material Handling Operations

Enclosure Efficiency - Partially Enclosed	50%
Enclosure Efficiency - Enclosed in Building	75%
Enclosure Efficiency - Enclosed Underground	90%
Enclosure Efficiency - Airslides, Bucket Elevators, and Screw Conveyors	100%

Equipment ID	Description	Potential Future Throughput short tpy	Dust Collectors		Spray and Building Controls		Uncontrolled Emission Factor (lb/ton of throughput)				Controlled Emission Rates (tpy)[2]		
			Dust Collector ID	Capture Efficiency	Type of Control	Control Efficiency[1]	PM_{filt}	$PM_{10\text{-}filt}$	$PM_{2.5\text{-}filt}$	Reference	PM_{filt}	$PM_{10\text{-}filt}$	$PM_{2.5\text{-}filt}$
1.3.6	Transfer from Fly Ash Metering Scale with Spiral Governor (1.3.6) to Fly Ash Slurry Mixer (1.3.9)	45,579	None	0.0%	Entirely Enclosed	100%	3.00E-03	1.10E-03	8.80E-04	AP-42 Table 11.19.2-2, Conveyor Transfer Point, Uncontrolled, Assumed 80% of PM10 is PM2.5	0.000	0.000	0.000
S-DH-Ash	Transfer from Fly Ash Discharge Hopper (S-DH-Ash) to Fly Ash Slurry Mixer (1.3.9)	45,579	Dust Collector (1.3.7)	99.9%	None	0%	4.41E-05	2.09E-05	3.16E-06	AP-42 Section 13.2.4 Drop Equation for Fly Ash	0.000	0.000	0.000
3.3	Autoclave	92,837	None	0.0%	None	0%	0.00E+00	0.00E+00	0.00E+00	Per engineering design estimate, no particulate emissions anticipated.	0.000	0.000	0.000
										TOTAL:	**0.38**	**0.32**	**0.26**

1 Spray control efficiencies are only provided for transfer utilizing the drop equation. Others use controlled emission factors which already incorporate a spray control efficiency.
2. Emissions calculated using the following equation:

$$PM = T \times (1 - \eta_{DC}) \times (1 - \eta_{SE}) \times EF \times \frac{1}{2{,}000}$$

Where:

PM= Annual PM/PM_{10}/$PM_{2.5}$ emissions (tpy)
T = Material handling throughput (tpy)
η_{DC} = Dust collector capture efficiency
η_{SE} = Spray or enclosure efficiency
EF = PM/PM_{10}/$PM_{2.5}$ Emission factor, specific to material and process (lb/ton of throughput)

3. Assumed there are no emissions from aluminum transfers
4. Throughput for Ball Mill includes sand and waste product.
5. Assumed fly ash slurry throughput for these transfers since it is larger than the sand slurry throughput.
6. Material handling operations involving the slurry mixture are not shown because transfers of slurry mixtures are assumed to have no emissions.

Dust Collectors

Source Identification	Description	Flow Rate (acfm)	Moisture [2] (%)	Temperature (°F)	Flow Rates (dscfm)	Future Hours of Operation (hr/yr)	PM_{filt} Grain Loading (gr/dscf)	$PM_{10\text{-}filt}$ Grain Loading (gr/dscf)	$PM_{2.5\text{-}filt}$ Grain Loading (gr/dscf)	Controlled Emission Rates[1]		
										PM_{filt} (tons/yr)	$PM_{10\text{-}filt}$ (tons/yr)	$PM_{2.5\text{-}filt}$ (tons/yr)
1.1.8c	Cement Silo 1 DC	2,060	0	212	1,942	6,750	0.01311	0.0131	0.010	0.74	0.74	0.59
1.1.8d	Cement Silo 2 DC	2,060	0	212	1,942	6,750	0.01311	0.0131	0.010	0.74	0.74	0.59
1.1.8b	Gypsum DC	2,060	0	212	1,942	6,750	0.01311	0.0131	0.010	0.74	0.74	0.59
1.1.8a	Lime DC	2,060	0	212	1,942	6,750	0.01311	0.0131	0.010	0.74	0.74	0.59
1.1.8e	Waste Silo DC	2,060	0	212	1,942	6,750	0.01311	0.0131	0.010	0.74	0.74	0.59
1.2.5	Jaw Crusher DC	3,531	0	212	3,329	6,750	0.01311	0.0131	0.010	1.26	1.26	1.01
1.3.2	Fly Ash Powder Silo DC	2,060	0	212	1,942	6,750	0.01311	0.0131	0.010	0.74	0.74	0.59
1.3.7	Fly Ash Discharge Hopper DC	3,531	0	212	3,329	6,750	0.01311	0.0131	0.010	1.26	1.26	1.01
									TOTAL:	**6.94**	**6.94**	**5.55**

1. Emissions calculated using the following equation:

$$PM = FR \times GL \times \frac{1}{7{,}000} \times \frac{1}{2{,}000} \times 60 \times H$$

Where:

PM = $PM/PM_{10}/PM_{2.5}$ emissions (tpy)
FR = Design flow rate (dscfm)
GL = $PM/PM_{10}/PM_{2.5}$ grain loading (gr/dscf)
H = Hours of operation (hr/yr)

2. Assumed 0% moisture as a conservative measure since no data is available.
3. Grain Loading values from the Changzhou Success Building Material Machinery Co., Ltd. Equipment Catalog

Storage Piles

Pile Name	Size[1] (ft^2)	Throughput (tpy)	Average Silt Content[2] (%)	No. of days with >= 0.01 in of precip.	Time Wind Speed > 15 mph[5] (%)	Control Measures	Moisture / Enclosure Control (%)	Controlled Emission Factor (lb/acre/day)	$PM_{10\text{-}filt}$ / PM Ratio[3]	$PM_{2.5\text{-}filt}$ / PM Ratio[3]	Controlled Emission Rates (tpy)[4]		
											PM_{filt}	$PM_{10\text{-}filt}$	$PM_{2.5\text{-}filt}$
Sand Stockpile	3,172	42,638	2.6	150	2.20	None	0%	0.40	0.5	0.075	0.005	0.003	0.000
Waste Product Pile	892	2,480	80	150	2.20	Partially enclosed	50%	6.08	0.5	0.075	0.023	0.011	0.002
										TOTAL:	**0.03**	**0.01**	**0.00**

1. Pile size estimated based on annual throughput and the expected material turnover rate, as provided by America's Best Block in the "Brief Introduction of Technological Design of Daily Output 400 Cubic Meters AAC Block Production Line to be Set Up in U.S.A."
2. Silt contents are based on AP-42 Table 13.2.4-1; Waste product assumed to be mostly fly ash as conservative estimate, as fly ash has the highest average silt content of the materials used in America's Best Block brick manufacturing
3. PM speciation from AP-42 Section 13.2.5
4. Emissions calculated using the following formula from Air and Waste Management Association, Air Pollution Engineering Manual:

$$PM = 1.7 \times \frac{s}{1.5} \times \frac{(365-P)}{235} \times \frac{f}{15} \times p \times a \times 365 \times \frac{1}{2{,}000} \times (1-\eta)$$

Where:

PM = $PM/PM_{10}/PM_{2.5}$ emissions (tpy)
s = Average silt content of material
P = Number of days with 0.01 inches of precipitation or more (days/yr)
f = Time when wind speed if greater than 15 mph (%)
p = Particle size ratio
a = Pile surface area (acres)
η = Moisture/enclosure efficiency

5. Based on wind data for Cumberland Regional Airport for Oct 2013 - Sept. 2016.

Haul Roads

Description	Registration Number	Paved / Unpaved	Empty Weight (tons)	Max Load (tons)	Mean Vehicle Weight (tons)	Material Net (tons)	Distance (mile)	Throughput (tpy)	Trips per Year	Mileage per Year	Control (%)	Emissions (tpy)		
												PM_{filt}	$PM_{10\text{-}filt}$	$PM_{2.5\text{-}filt}$
		Paved	15	40	27.5	25	0	38,681	1,547	0	0	0.00	0.00	0.00
Sand Delivery	043-0008-6-0495	Unpaved	15	40	27.5	25	0.19	38,681	1,547	293	0	0.79	0.22	0.02
		Paved	15	40	27.5	25	0	20,007	800	0	0	0.00	0.00	0.00
Lime Delivery	043-0008-6-0495	Unpaved	15	40	27.5	25	0.19	20,007	800	152	0	0.41	0.11	0.01
		Paved	15	40	27.5	25	0	2,001	80	0	0	0.00	0.00	0.00
Gypsum Delivery	043-0008-6-0495	Unpaved	15	40	27.5	25	0.19	2,001	80	15	0	0.04	0.01	0.00
		Paved	15	40	27.5	25	0	6,669	267	0	0	0.00	0.00	0.00
Cement Delivery	043-0008-6-0495	Unpaved	15	40	27.5	25	0.19	6,669	267	51	0	0.14	0.04	0.00
		Paved	15	40	27.5	25	0	41,349	1,654	0	0	0.00	0.00	0.00
Fly Ash Delivery	043-0008-6-0495	Unpaved	15	40	27.5	25	0.19	41,349	1,654	313	0	0.85	0.23	0.02
Sales Road	043-0008-0496 and 0497	Paved	15	40	27.5	25	0.19	84,220	3,369	638	0	0.89	0.18	0.04
											TOTAL:	**3.12**	**0.79**	**0.11**

Unpaved Road Emissions

Unpaved Roads: $E = k(s/12)^{a}(W/3)^{b})*[(365-p)/365]$

k Factor (PM, PM_{10}, $PM_{2.5}$) (lb/VMT)	4.9	1.5	0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	7.1	%		AP-42 Table 13.2.2-1 (Final, 11/06)
Number of Rain Days, p	150			AP-42 Figure 13.2.2-1 (Final, 11/06)
a (PM, PM_{10}, $PM_{2.5}$)	0.7	0.9	0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b (PM, PM_{10}, $PM_{2.5}$)	0.45	0.45	0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

Paved Roads Emissions: $E = k(sL)^{0.91}(W)^{1.02}*(1-P/4N)$

k Factor (PM, PM_{10}, $PM_{2.5}$) lb/VMT	0.011	0.0022	0.00054	AP-42 Table 13.2.1-1 (Final, 1/11)
Silt Loading, sL	12	g/m^2		AP-42 Table 13.2.1-3 (Final, 1/11)
Number of Rain Days, P	150			AP-42 Figure 13.2.1-2 (Final, 1/11)
Number of Days in Averaging Period, N	365			

ATTACHMENT O: MONITORING/RECORDKEEPING/REPORTING/TESTING PLANS

ATTACHMENT O – Monitoring/Recordkeeping/Reporting Testing Plans

Table O-1. Monitoring Plan

Unit ID	Control Device/ Emission Point	Citation	Monitoring Plan
S-1.1.2	DC 1.1.8b	40 CFR 60.674(c)	Quarterly 30-minute visible emissions inspections using EPA Method 22 (40 CFR part 60, Appendix A–7). The Method 22 (40 CFR part 60, Appendix A–7) test shall be conducted while the baghouse is operating. The test is successful if no visible emissions are observed. If any visible emissions are observed, the owner or operator of the affected facility must initiate corrective action within 24 hours to return the baghouse to normal operation. America's Best Block may establish a different baghouse-specific success level for the visible emissions test (other than no visible emissions) by conducting a PM performance test according to §60.675(b) simultaneously with a Method 22 (40 CFR part 60, Appendix A–7) to determine what constitutes normal visible emissions from that affected facility's baghouse when it is in compliance with the applicable PM concentration limit in Table 2 of this subpart. The revised visible emissions success level must be incorporated into the permit for the affected facility.
S-1.2.8	DC 1.1.8e		
S-1.2.2, S-1.2.3a	DC 1.2.5		

Table O-2. Recordkeeping Plan

Unit ID	Control Device/Emission Point	Regulatory Citation	Recordkeeping Plan
S-1.1.2	DC 1.1.8b	40 CFR 60.674(c) 40 CFR 60.676(b)(1)	Record each Method 22 (40 CFR part 60, Appendix A–7) test, including the date and any corrective actions taken, in the logbook required under 40 CFR 60.676(b). Record of each periodic inspection required under 40 CFR 60.674(c), including dates and any corrective actions taken, in a logbook (in written or electronic format). Keep the logbook onsite and make hard or electronic copies (whichever is requested) of the logbook available to the Director upon request.
S-1.2.8	DC 1.1.8e		
S-1.2.2, S-1.2.3a	DC 1.2.5		
S-Boiler	E-Boiler	40 CFR 60.48c(g)(2)	Maintain records of the amount of natural gas combusted during each calendar month.

Table O-3. Reporting Plan

Unit ID	Control Device/Emission Point	Regulatory Citation	Reporting Plan
S-1.1.2	DC 1.1.8b	40 CFR 60.676(f)	Written reports will be submitted of the results of all performance tests conducted to demonstrate compliance with the standards set forth in 40 CFR 60.672, including reports of opacity observations made using Method 9 to demonstrate compliance with 40 CFR 60.672(f).
S-1.2.8	DC 1.1.8e		
S-1.2.2, S-1.2.3a	DC 1.2.5		
S-1.2.4	Fugitive		
S-1.2.7	Fugitive		
S-1.2.3b	Fugitive		
S-1.4.4	Fugitive	40 CFR 60.676(i)	The actual date of the initial startup of each affected facility will be submitted to the Administrator.
S-1.4.7	Fugitive		

Table O-4. Testing Plan

Unit ID	Control Device/Emission Point	Regulatory Citation	Testing Plan
S-1.1.2	DC 1.1.8b	40 CFR 60, Subpart OOO, Table 2	An initial performance test in accordance with 40 CFR 60.8 and 40 CFR 60.675 will be conducted.
S-1.2.8	DC 1.1.8e	40 CFR 60, Subpart OOO, Table 3	An initial performance test in accordance with 40 CFR 60.11 and 40 CFR 60.675 will be conducted.
S-1.2.2, S-1.2.3a	DC 1.2.5	40 CFR 60.675(b)(1)	Except as specified in 40 CFR 60.675 paragraphs (e)(3) and (e)(4), Method 5 (or Method 5I) of 40 CFR 60 Appendix A-3 of or Method 17 of Appendix A-6 of 40 CFR 60 will be used to determine the particulate matter concentration. The sample volume will be at least 1.70 dscm (60 dscf). For Method 5, if the gas stream being sampled is at ambient temperature, the sampling probe and filter may be operated without heaters. If the gas stream is above ambient temperature, the sampling probe and filter may be operated at a temperature high enough, but no higher than 121°C (250°F), to prevent water condensation on the filter. Method 9 of Appendix A-4 of 40 CFR 60 and the procedures in 40 CFR 60.11 will be used to determine opacity, with the following additions: › The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet); › The observer shall, when possible, select a position that minimizes interference from other fugitive emissions sources (e.g., road dust). The required observer position relative to the sun (Method 9 of Appendix A-4 of 40 CFR 60, Section 2.1) must be followed. When determining compliance with the fugitive emissions standard for any affected facility described under 40 CFR 60.672(b) or 60.672(e)(1), the duration of the Method 9 (40 CFR 60, Appendix A–4) observations must be 30 minutes (five 6-minute averages). Compliance with the applicable fugitive emission limits in Table 3 of this subpart must be based on the average of the five 6-minute averages.
S-1.2.4	Fugitive		
S-1.2.7	Fugitive	40 CFR 60.675(b)(2), 675(c)(1)	
S-1.2.3b	Fugitive		
S-1.4.4	Fugitive	40 CFR 60. 675(c)(3)	
S-1.4.7	Fugitive		

Unit ID	Control Device/Emission Point	Regulatory Citation	Testing Plan
S-1.1.2	DC 1.1.8b	40 CFR 60.675(c)(2)	In determining compliance with the opacity of stack emissions from any baghouse that controls emissions only from an individual enclosed storage bin under 60.672(f) of 40 CFR 60, using Method 9 (40 CFR 60, Appendix A-4), the duration of the Method 9 observations shall be one (1) hour (ten 6-minute averages). The duration of the Method 9 observations may be reduced to the duration the affected facility operates (but not less than 30 minutes) for baghouses that control storage bins or enclosed truck or railcar loading stations that operate for less than one (1) hour at a time.
S-1.2.8	DC 1.1.8e		

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that America's Best Block has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit to construct a facility to manufacture Autoclave Aerated Concrete blocks. America's Best Block's plant will be located at 780 Waxler Road in Keyser, West Virginia. The latitude and longitude coordinates are: 39.447157 N, -78.951349 W.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:
Particulate Matter (PM): 10.89 tons per year (tpy)
Particulate Matter < 10 microns (PM10): 8.49 tpy
Particulate Matter < 2.5 microns (PM2.5): 6.34 tpy
Oxides of Nitrogen (NOx): 11.19 tpy
Carbon Monoxide (CO): 5.47 tpy
Volatile Organic Compounds (VOC): 0.40 tpy
Sulfur Dioxide (SO2): 0.04 tpy
Carbon Dioxide equivalent (CO2eq): 6,825 tpy

Construction is planned to begin in May 2017, with startup of the plant planned for December 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.
Dated this the 23 day of March, 2017

By: America's Best Block, Inc.
Magdi Hassanein
Chairman
20000 Tanbark Way
Brinklow, MD 20862