CEMEX

Ms. Teresa Heron
Florida Department of Environmental Protection
Division of Air Resource Management
2600 Blair Stone Road MS 5500
Tallahassee, Florida 32399-2400

19 January 2009

RE: 0530021-017-AC

Dear Ms. Heron:

CEMEX, Inc. has a strong commitment to sustainability. CEMEX, Inc. efforts include the use of renewable energy in the form of alternate fuels in order to eliminate landfill wastes and reduce the reliance on fossil fuels. The State of Florida has a rich history in promulgating the use of renewable energy and CEMEX, Inc. wishes to continue in that tradition by being allowed to consume yard waste and engineered fuel as a source of renewable energy.

Attached you will find information published by the State of Florida concerning the use of renewable energy, information on the composition and use of engineered fuels, and a proposed test protocol for providing the State with emission information that supports CEMEX's position that air quality can be maintained while combusting these materials.

CEMEX, Inc. proposes a trial burn for both yard waste and engineered fuels with extensive stack testing in order to be able utilize these renewable fuels and demonstrate the maintenance of emissions levels below permitted limits.

If you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

LAWRENCE LUCARELLI
LICENSE
No. 58956
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Lawrence Lucarelli, P.E.
Senior Manager, Environmental
CEMEX, Inc.
840 Gessner, Suite 1400
Houston TX 77024
713-973-5069

YARD WASTE

The CEMEX Brooksville South cement plant is requesting the ability to conduct a trial burn of yard waste as an alternate fuel leading to a permit application for permanent use of yard waste an alternate fuel. CEMEX believes they can provide a service to the State of Florida by removing material that would ordinarily be disposed of in a landfill at a cost to the State, reducing fossil fuel consumption and further the company's progress to sustainability.

Yard Waste is a vegetative waste resulting from the care and maintenance of landscaped areas, lawns, and gardens. Yard waste includes leaves, grass clippings, brush, garden waste, tree trunks, holiday trees and prunings from trees or shrubs. Yard waste is collected in total and prunnings from trees and shrubs are not separated from the remaining organic materials.

The State of Florida has a long history of combusting yard waste and CEMEX would like to continue addressing the State's efforts. The following information supports the use of yard waste as a fuel:

In 1996 the Florida Department of Environmental Protection published a 103 page study of alternate uses for yard waste. These are some excerpts from that publication that relate to energy transfer:

RECYCLING
YARD TRASH:
Best Management Practices Manual For Florida

Table 1.3 City of St. Petersburg
Brush Site Yard Trash Composition
Description Cubic Yard Weight
Grass Clippings 2% 4%
Tree Cuttings >1inch dia. 9% 28%
Brush <1inch dia. 55% 54%
Palm Fronds 30% 10%
Small Vegetation 3% 3%
Sand & Dirt 1% 1%

Fuel Production
Processing yard trash for fuel is similar to composting and mulching. Fuel produced from yard trash, also known as biomass fuel, is a valuable renewable energy resource. One of the most important benefits of fuel production is that it provides a major market for the large volume of yard trash generated in Florida. Fuel production is a relatively low-cost option that frequently requires only size reduction and distribution. End users may require the material to be screened to remove the fines and contaminants.

Chapter 5
FUNDAMENTALS OF FUEL PRODUCTION

Almost any type of vegetative material can be considered for fuel including yard trash, scrap wood from construction and demolition, commercial tree trimmings, land-clearing debris, pallets, etc. Research on the combustion characteristics of yard trash has suggested, however, that if large quantities of grass clippings and other fine trimmings are included in the material, screening may be required.

Burning yard waste for fuel has been a staple of Florida energy production:

Collier collects over 515 tons of yard waste from Tropical Storm Fay damage
By Staff Reports
Thursday, September 4, 2008
Since Aug. 28, the first day contractors began collecting the estimated 20,000 cubic yards of Tropical Storm Fay-related horticultural debris scattered across Collier County, nearly 5,329 cubic yards, or 515.54 tons, have been picked up, according to the county's Public Utilities Division.
Small trees and tree limbs, palm fronds, shrubs and other bits and pieces of yard waste brought down or uprooted by Tropical Storm Fay's reported 60 mph winds are being collected and transported to a staging site at the Collier County Landfill. The yard waste is ground into mulch and then hauled to the Okeelanta Biomass Cogeneration Plant in Palm Beach County.
There, the mulch is reused as an alternative fuel source to power the Okeelanta Sugar Mill and Florida Crystals Refinery.

Also, from the Tampa City web page (highlight is by CEMEX):

In the late 1970s, the 19 most populated counties in Florida were required by state law to investigate resource recovery: recovering energy and materials from municipal solid waste. Although waste-to-energy was commonly used in Europe and Japan at the time, it was relatively new in the United States. Waste-to-energy has since emerged in Florida and the rest of the country as a clean, reliable method of waste disposal.

Recently, the State of Florida, along with other states around the country, has taken an interest in the subject of renewable energy in order to decrease our dependence on fossil fuels. There are two basic types of renewable energy – non-combustion and combustion based sources. Solar, wind and hydropower are the non-combustion sources that usually come to mind when people hear the term renewable energy. Combustion sources are usually "biomass" facilities that burn wood and agricultural waste, yard trimmings and municipal solid waste. Waste-to-energy is a significant contributor of renewable energy in the State of Florida.

Surprisingly, solar, wind and hydropower do not play a major role in providing renewable energy in Florida. Although we think of Florida as windy, it is not the steady type of wind necessary for energy production like that found on hilltops, as in Texas and California, or in flatlands, as in Kansas and Wisconsin. (One of the strongest wind states is North Dakota.) Major sources of hydropower are lacking in Florida. There is some potential for solar power if it is incorporated into new construction; however, it is very expensive compared to other renewable energy sources. The best opportunities for producing significant amounts of renewable energy in Florida will likely come from combustion-based sources. Half of Florida's population is served by solid waste systems that utilize waste-to-energy, and the state's 13 facilities put Florida in a position of producing more energy from solid waste than any other state. Generating energy from solid waste is very compatible with materials recycling programs. In fact, communities with waste-to-energy facilities have some of the most successful recycling programs, utilizing curbside collection, drop-off centers, and metal recovery at the facilities themselves.

At Tampa's McKay Bay Waste-to-Energy Facility, what cannot be recycled is incinerated at high temperatures, generating steam, which is supplied to a turbine generator that makes electricity. The Tampa Electric Company purchases the electricity generated by the McKay Bay Facility. Revenues from the sale of the electricity help to offset the costs of waste disposal. In addition to recovering energy from municipal solid waste, Tampa has a materials recycling program for recovering glass, aluminum, paper, and yard waste. Additionally, the City, along with other Florida communities, is currently looking into the possibility of recycling the ash that remains after waste is combusted at the waste-to-energy facility. Ash recycling is fairly common in Europe, and is just beginning to make its way into the United States and parts of Asia. Ash from waste-to-energy facilities can be used as a substitute material for road construction and in commercial construction applications such as structural fill, pipe bedding, and paving and cinder blocks. Another key recycling activity conducted at waste-to-energy facilities is the recycling of metals separated from the ash after combustion. Wheelabrator, the operator of Tampa's McKay Bay Waste-to-Energy Facility, recovers enough metal at this facility to produce 4000 automobiles per year.

In keeping with the Clean Air Act of 1990, waste-to-energy facilities in Florida and the rest of the United States have recently been retrofitted and have state-of-the-art technology for the control of air emissions. Waste-to-energy facilities are one of the cleanest sources of renewable power in the world, and are a good partner to recycling in our local communities' waste management programs.

CEMEX believes that the inclusion of yard waste (sometimes called yard trash in the Florida regulations) as an alternate fuel would benefit the State of Florida and reduce CEMEX's demand for fossil fuels.

ENGINEERED FUEL

The CEMEX Brooksville South cement plant is also requesting the ability to conduct a trial burn of an Engineered Fuel as an alternate fuel leading to a permit application for permanent use as an alternative fuel. The CEMEX Wampum plant in Pennsylvania is permitted and has been successfully using an Engineered Fuel as an alternate to fossil fuels. The fuel supplier is VEXOR and the material as supplied is approximately one inch long and 0.1 inched in diameter. The high surface area allows for complete combustion in CEMEX kilns. The Engineered Fuel is composed primarily of wood (sawdust, paper, cardboard) and includes some shredded consumer goods, adhesive waste, resins, etc. The supplier is required to prequalify each waste stream prior to acceptance to assure that the material does not contain a hazardous waste. If not used as an Engineered Fuel, these components would be disposed of in a landfill. The material is blended and reduced to a powder before being formed into the final shape. The Engineered Fuel is very consistent from batch to batch with respect to composition.

CEMEX has completed extensive testing on both the raw materials and emissions while utilizing Engineered Fuel as a fossil fuel substitute. The Engineered Fuel contains very low levels of both metals and VOCs – See the attached CEMEX Fuel Evaluation Form and chemical analysis from a third party laboratory. Also attached you will find the stack testing results while burning this alternative fuel.

CEMEX believes that the use of an Engineered Fuel can reduce landfill costs, reduce the use of fossil fuels, reduce CO_2 emissions overall and demonstrate the company's commitment to sustainability.

PROPOSED STACK TESTING PROTOCOL FOR METALS ANALYSIS WHILE BURNING ENGINEERED FUELS

CEMEX plans to utilize EPA Methods 1 through 5, and Method 29 for the analysis of the metals being emitted during the testing of both yard waste and Engineered Fuel. The metals tested will be Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, and Thallium. Emissions measured by existing CEM systems will also are recorded and available for review.

CEMEX plans to use existing stack test data as a baseline for emissions of presently permitted emissions. Method 29 baseline testing will also be performed.

CEMEX will perform preliminary work to include:

a. Installation and debugging of material feed equipment – 20 days
b. Installation and debugging of measurement equipment – 5 days
c. Baseline testing, mill on – 3 days

CEMEX is requesting a 60 day trial burn period and will include:

a. Equilibrium time for yard waste/engineered fuel emission stabilization, mill on - 20 days each material
b. Stack testing, yard waste – 10 days
c. Stack testing, Engineered Fuel – 10 days

Alternate fuels will not be tested in the mill off condition as during normal operation, they will not be introduced into the kiln during mill off conditions.

CEMEX believes this test procedure will determine that neither yard waste nor Engineered Fuel will increase emissions measured by CEM systems or metals emissions above existing permitted standards.

Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. This Standard must be
consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *VEXOR Engineered Fuel (VEF)*	Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name: VEXOR Technology, Inc.	Emergency Telephone Number 877-721-9773
Address: 955 W. Smith Rd.	Telephone Number for Information 877-721-9773
Medina, OH 44256	Date Prepared 7/18/06
	Signature of Preparer *(optional)*

Section II - Hazard Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*
No hazardous components				
Absorbents (sawdust, paper, cardboard)				20-30
Shredded consumer goods (shampoos, soaps, personal care goods)				5-20
Latex, adhesive waste and washes				5-10
Oily debris				10-20
Banbury sludge				10-20
Resins, gels and polyols				10-20
Carbon black				5-20
Shredded plastics, paper goods				10-20

Section III - Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H_2O = 1)	0.7
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	
Solubility in Water N/A			
Appearance and Odor Brownish/black solid with little to mild odor with particle size of less than ½"			

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) >200 F	Flammable Limits	LEL	UEL
Extinguishing Media Foam or water			
Special Fire Fighting Procedures Wear self contained breathing apparatus			
Unusual Fire and Explosion Hazards None			

Section V - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	N/A
Incompatibility *(Materials to Avoid)* Avoid oxidizers due to material being organic			
Hazardous Decomposition or Byproducts N/A			
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	N/A

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
Health Hazards *(Acute and Chronic)*			
None known			
Carcinogenicity: N/A	NTP?	IARC Monographs?	OSHA Regulated?
Signs and Symptoms of Exposure			
Medical Conditions Generally Aggravated by Exposure			
Emergency and First Aid Procedures Wash any exposed skin with soap and water.			

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled Absorb any liquid with sawdust. Sweep up and place in container for disposal.
Waste Disposal Method material can be disposed of in a licensed landfill or can be burned at an incinerator with appropriate scrubbers.
Precautions to Be taken in Handling and Storing N/A
Other Precautions N/A

Section VIII - Control Measures

Respiratory Protection *(Specify Type)*		
Ventilation	Local Exhaust: Should be adequate	Special
	Mechanical *(General)*	Other

Protective Gloves: Rubber gloves	Eye Protection: Safety glasses or goggles
Other Protective Clothing or Equipment Long sleeve shirts, long pants	
Work/Hygienic Practices Always wash hands or any other exposed skin after handling.	

Section IX - Special Precautions

Precautions to be taken in Handling and Storing N/A
Other Precautions

Each MSDS must be reviewed for correctness and completeness every three years.

Reviewed by __Patrick Oberth__________ Reviewed by ____________________

Revision date __May 21, 2007__________ Revision date ____________________

CEMEX

FUELS EVALUATION FORM

Name of Fuel : Non-Hazardous Engineered Fuel Solids

Which CEMEX Plant ? Wampum, PA

FuelProduced or Owned By:		Fuel Inventory or Storage Location:	
Company:	VEXOR Technology, Inc.	*Company:*	VEXOR Technology, Inc.
Street:	955 W. Smith Road	*Street:*	955 W. Smith Road
City/State/Zip:	Medina, OH 44256	*City/State/Zip:*	Medina, OH 44256

In the space provided below describe, in detail, the process from which this Fuel is produced :

VEXOR Engineered Fuel ("VEF") is produced from a blend of various non-RCRA hazardous waste sources to schieve a consistent, flowable fuel with specs of 9500 to 12000 BTU/lb and a particle size of 1/2" or less.

Describe the typical physical characteristics, storage, proposed modes of transport, and annual tonnage:

VEF is a free flowing solid fuel which can be stored in piles and is delivered to the kiln site in dump trailers. We can produce whatever amount is reqyuired for this kiln.

This Evaluation Form Completed By :

Name :	Patrick Oberth
Title, Co.:	Facility Manager, VEXOR
Street:	955 W. Smith Rd.
City/State:	Medina, OH
Phone:	877-721-9773

In the States or Localities of use, storage or production ---

Is Fuel a Hazardous Waste :	*Yes / No*
- Defined by Federal Regulations ? ---	No
- Defined by State Regulations ? ------	No
Is Fuel a "Regulated" Waste ?	No
Is Fuel a " Special " Waste ? --	No

(Note: Use Additional Pages(s) as attachments to this Form for any Needed Comments or Explanations)

Chemical Compounds :

Sample ID : 072-33569-001

	Weight %
*SiO_2 :	1.98
*Al_2O_3 :	0.84
*Fe_2O_3 :	0.97
*CaO :	0.73
*MgO :	0.16
*SO_3 :	0.56
*Na_2O :	0.18
*K_2O :	0.11
*TiO_2 :	0.38
*P_2O_5 :	0.13
*Mn_2O_3 :	0.02
*SrO :	0.01
$LOI_{(950\ C)}$:	93.46
Total :	99.53
	Results are on an ignited basis

		Units	
Chlorine:	216	PPM	C114
Calorific Value:	11,084	Btu/lb	D240
Ultimate Analysis:			
Moisture:	11.88	%	D5142
Ash:	5.79	%	D482 - D5142
Carbon:	56.82	%	D5291
Hydrogen:	6.85	%	D5291
Nitrogen:	0.78	%	D5291
Total Sulfur:	0.38	%	D5016 (Solid)
Oxygen:	17.50	%	

Liquids ONLY

		Units	
Water:		%	FisherAST
Viscosity @ 100F:		Ctps	D445
Total Solids:		%	D482
Specific Gravity:			D4052

Solids ONLY

		Units	
Hardgrove, incl. Moisture:		Index	D409
Particle Size:		100%	Retained or Passing Screen Size

*X-Ray Fluorescense spectrometry.

Unless otherwise noted, ANALYTICAL methods are ASTM methods.

I certify that I am a duly authorized representative of the producer, owner and /or generator and that all information provided hereon, or attached hereto is true, accurate and correct.

By : ______________________ ____________

Signature ---- Title Date

CEMEX Environmental	Plant Operations/Environm.

rev2/1/08

CEMEX

FUELS EVALUATION FORM

Sample ID : 9964616

METALS : Constituent	TCLP Limit ≤ mg / L	TCLP mg / L	TOTAL mg / Kg	SW-846 Methods Constituent Analysis
Arsenic	5.0	< 0.009	< 0.1	6010B or 7060
Barium	100.0	0.590	314	6010B
Cadmium	1.0	< 0.001	0.488	6010B
Chromium, Total	5.0	0.010	35.0	6010B
Lead	5.0	0.081	33.0	6010B
Mercury	0.2	< 0.0001	0.012	7741
Selenium	1.0	< 0.01	< 0.25	6010B or 7740
Silver	5.0	< 0.002	0.84	6010B
Antimony	N/A	0.095	127	6010B
Beryllium	N/A	< 0.001	< 0.075	6010B
Cobalt	N/A	0.048	11.9	6010B
Copper	N/A	< 0.001	193	6010B
Manganese	N/A	0.988	53.3	6010B
Nickel	N/A	0.032	18.2	6010B
Thallium	N/A	< 0.006	< 0.2	6010B or 7841
Zinc	N/A	29.40	2510	6010B

		Units	
Total Halogens	1311	Mg/L	9253
PCB		Mg/L	8082

Liquids ONLY

		Units	
Flash Point:		Deg. F	D92

Volatile Organics:

Semi-Volatile Organics:

1.Unless otherwise noted ANALYTICAL methods are ASTM methods.

SGS

July 07, 2008

Cemex, Inc.
2001 Portland Park
Wampum, PA 16157
USA

Client Sample ID:	Medina Vexor/EF Solids	**Date Sampled :**	5/29/2008
Date Received:	06/23/2008	**Kind of Sample :**	EF Solids
Matrix:	Unknown	**P. O. # :**	102363 OS
Net Sample Weight:	174.20		

SGS Sample ID: 072-33569-001

		As Received	**Dry**	**MAF**
% Moisture, Total	[ASTM D 3302]	11.88		
% Ash	[ASTM D 3174/5142]	5.79	6.57	
% Volatile Matter	[ASTM D 5142]	55.29	62.75	67.16
% Fixed Carbon	[ASTM D 3172]	27.04	30.68	32.84
Gross Calorific Value (Btu/lb)	[ASTM D 5865]	11084	12578	13462
% Sulfur	[ASTM D 4239]	0.38	0.43	
% Carbon	[ASTM D 5373]	56.82	64.49	
% Hydrogen	[ASTM D 5373]	6.85	7.77	
% Nitrogen	[ASTM D 5373]	0.78	0.88	
% Oxygen (Calc)	[ASTM D 3176]	17.50	19.86	

Analyte	**Result**	**Method**
Pounds of Ash/mm Btu	5.22 lb	ASTM D 5865
Pounds of Sulfur/mm Btu	0.34 lb	ASTM D 5865
Pounds of SO2/mm Btu	0.69 lb	ASTM D 5865

Respectfully submitted,
SGS NORTH AMERICA INC.

Denver Laboratory

SGS North America Inc. | Minerals Services Division
4665 Paris Street, Suite B-200, Denver, CO 80239 t (303) 373-4772 f (303) 373-4791 www.us.sgs.com/minerals

SGS

July 07, 2008

Cemex, Inc.
2001 Portland Park
Wampum, PA 16157
USA

Client Sample ID:	Medina Vexor/EF Solids	**Date Sampled :**	5/29/2008
Date Received:	06/23/2008	**Kind of Sample :**	EF Solids
Matrix:	Unknown	**P. O. # :**	102363 OS
Net Sample Weight:	174.20		

SGS Sample ID: 072-33569-001

Analyte	Result	Method
Ash Analysis Basis	Dry	ASTM D 4326
Silicon Dioxide SiO2	1.98 %	ASTM D 4326
Aluminum Oxide Al2O3	0.84 %	ASTM D 4326
Titanium Dioxide TiO2	0.38 %	ASTM D 4326
Iron Oxide Fe2O3	0.97 %	ASTM D 4326
Calcium Oxide CaO	0.73 %	ASTM D 4326
Magnesium Oxide MgO	0.16 %	ASTM D 4326
Potassium Oxide K2O	0.11 %	ASTM D 4326
Sodium Oxide Na2O	0.18 %	ASTM D 4326
Sulfur Trioxide SO3	0.56 %	ASTM D 4326
Phosphorus Pentoxide P2O5	0.13 %	ASTM D 4326
Strontium Oxide SrO	0.01 %	ASTM D 4326
Barium Oxide BaO	0.22 %	ASTM D 4326
Manganese Oxide MnO2	0.02 %	ASTM D 4326
Chlorine, Dry	2.16 %	ASTM D 6721
Loss on Ignition	93.46 %	ASTM D 3174

Respectfully submitted,
SGS NORTH AMERICA INC.

Tony Styke

Denver Laboratory

SGS North America Inc. | Minerals Services Division
4665 Paris Street, Suite B-200, Denver, CO 80239 t (303) 373-4772 f (303) 373-4791 www.us.sgs.com/minerals

CEMEX, INC
MARISELA VILLASMIL
840 GESSNER ROAD SUITE 1400
HOUSTON, TX 77024

DESCRIPTION: MEDINA VEXOR/
EF SOLIDS
DATE SAMPLED: 05/29/08 ------
DATE RECEIVED: 06/23/08 16:00
DATE REPORTED: 07/07/08
AC&S LAB # 9964616

TOTAL METALS:	METHOD:	TIME:	DATE:	ANALYST:	MDL:	RESULTS:
ANTIMONY	6010B	19:03	07/02/08	LEG	1.75mg/kg	127mg/kg
ARSENIC	6010B	19:07	07/02/08	LEG	0.1mg/kg	ND
BARIUM	6010B	19:03	07/02/08	LEG	0.25mg/kg	314mg/kg
BERYLLIUM	6010B	19:07	07/02/08	LEG	0.075mg/kg	ND
CADMIUM	6010B	19:07	07/02/08	LEG	0.075mg/kg	0.488mg/kg
CHROMIUM	6010B	19:07	07/02/08	LEG	0.1mg/kg	35.0mg/kg
COBALT	6010B	19:07	07/02/08	LEG	0.05mg/kg	11.9mg/kg
COPPER	6010B	19:03	07/02/08	LEG	0.75mg/kg	193mg/kg
LEAD	6010B	19:07	07/02/08	LEG	0.175mg/kg	33.0mg/kg
MANGANESE	6010B	19:07	07/02/08	LEG	0.05mg/kg	53.3mg/kg
MERCURY	7471A	17:01	06/25/08	LEG	0.008mg/kg	0.012mg/kg
MOLYBDENUM	6010B	19:07	07/02/08	LEG	0.05mg/kg	21.9mg/kg
NICKEL	6010B	19:07	07/02/08	LEG	0.05mg/kg	18.2mg/kg
SELENIUM	6010B	19:07	07/02/08	LEG	0.25mg/kg	ND
SILVER	6010B	19:07	07/02/08	LEG	0.05mg/kg	0.84mg/kg
THALLIUM	6010B	19:07	07/02/08	LEG	0.2mg/kg	ND
ZINC	6010B	18:59	07/02/08	LEG	25mg/kg	2510mg/kg

TCLP METALS:	METHOD:	TIME:	DATE:	ANALYST:	MDL:	RESULT:
ANTIMONY	6010B	16:38	06/27/08	LEG	0.004mg/L	0.095mg/L
ARSENIC	6010B	16:38	06/27/08	LEG	0.009mg/L	ND
BARIUM	6010B	16:38	06/27/08	LEG	0.001mg/L	0.590mg/L
BERYLLIUM	6010B	16:38	06/27/08	LEG	0.001mg/L	ND
CADMIUM	6010B	16:38	06/27/08	LEG	0.001mg/L	ND
CHROMIUM	6010B	16:38	06/27/08	LEG	0.001mg/L	0.010mg/L
COBALT	6010B	16:38	06/27/08	LEG	0.0008mg/L	0.048mg/L
COPPER	6010B	16:38	06/27/08	LEG	0.001mg/L	ND
LEAD	6010B	16:38	06/27/08	LEG	0.004mg/L	0.081mg/L
MANGANESE	6010B	16:38	06/27/08	LEG	0.0006mg/L	0.988mg/L
MERCURY	7470A	15:01	07/02/08	LEG	0.0001mg/L	ND
MOLYBDENUM	6010B	16:38	06/27/08	LEG	0.0009mg/L	0.017mg/L
NICKEL	6010B	16:38	06/27/08	LEG	0.001mg/L	0.032mg/L
SELENIUM	6010B	16:38	06/27/08	LEG	0.01mg/L	ND
SILVER	6010B	16:38	06/27/08	LEG	0.002mg/L	ND
THALLIUM	6010B	16:38	06/27/08	LEG	0.006mg/L	ND
ZINC	6010B	12:41	07/02/08	LEG	0.02mg/L	29.4mg/L
TOTAL HALOGENS	9020B	14:58	06/26/08	LKF	9ug/g	1311ug/g

REF: Standard Methods for the Examination of Water and Wastewater 20th Edition 1998.
REF: USEPA SW-846, 3rd Edition December 1996
REF: USEPA Methods for Chemical Analysis of Water and Waters, 600/4-79-020, Revised March 1983.
ND: Not Detected. If present, the concentration is less than the MDL - Method Detection Limit.
* Certificate Number 010 for DEP of West Virginia.

REVIEWED BY:______________________________
REBECCA KISER

CEMEX, INC
MARISELA VILLASMIL
840 GESSNER ROAD SUITE 1400
HOUSTON, TX 77024

DESCRIPTION: MEDINA VEXOR
EF SOLIDS
DATE SAMPLED: 05/29/08 -------
DATE RECEIVED: 06/23/08 16:00
DATE REPORTED: 06/30/08
AC&S SAMPLE ID#: 9964616

PARAMETER	METHOD	TIME	DATE	ANALYST	MDL	RESULTS
HEXAVALENT CHROMIUM	7196A	15:45	06/27/08	MJB	0.20mg/kg	ND
pH	9045D	11:20	06/26/08	EJR	0.02SU	5.25SU
REACTIVE CYANIDE	9014	14:40	06/25/08	RAM	40mg/kg	ND
REACTIVE SULFIDE	9034	09:40	06/27/08	EJR	50mg/kg	ND

REF: USEPA SW-846
REF: USEPA Methods 40 CFR Part 136 App. A
REF: Standard Methods for the Examination of Water and Wastewater, 20th Edition 1998.
REF: USEPA Methods for Chemical Analysis of Water and Wastes, 600/4-79-020, Revised March 1983.
ND: Not Detected. If present, the concentration is less than the MDL - Method Detection Limit
* Certificate Number 010 for DEP of West Virginia.

REVIEWED BY:____________________________
PRISCILLA VASSAR

CEMEX, INC
MARISELA VILLASMIL
840 GESSNER ROAD SUITE 1400
HOUSTON, TX 77024

DESCRIPTION: MEDINA VEXOR
EF SOLIDS
DATE SAMPLED: 05/29/08 -------
DATE RECEIVED: 06/23/08 16:00
DATE REPORTED: 07/01/08
AC&S SAMPLE ID#: 9964616

POLYCHLORINATED BIPHENYLS - METHOD 8082

PARAMETER (CAS#)	METHOD	TIME	DATE	ANALYST	MDL	CONCENTRATION
AROCLOR 1016 (12674-11-2)	8082	18:02	06/27/08	LKF	0.1mg/kg	ND
AROCLOR 1221 (11104-28-2)	8082	18:02	06/27/08	LKF	0.1mg/kg	ND
AROCLOR 1232 (11141-16-5)	8082	18:02	06/27/08	LKF	0.1mg/kg	ND
AROCLOR 1242 (53469-21-9)	8082	18:02	06/27/08	LKF	0.1mg/kg	ND
AROCLOR 1248 (12672-29-9)	8082	18:02	06/27/08	LKF	0.1mg/kg	ND
AROCLOR 1254 (11097-69-1)	8082	18:02	06/27/08	LKF	0.1mg/kg	ND
AROCLOR 1260 (11096-82-5)	8082	18:02	06/27/08	LKF	0.1mg/kg	ND

SURROGATE	PERCENT RECOVERY
DCBP	62%

REF: USEPA SW-846
REF: USEPA Methods 40 CFR Part 136 App. A
REF: Standard Methods for the Examination of Water and Wastewater, 20th Edition 1998.
REF: USEPA Methods for Chemical Analysis of Water and Wastes, 600/4-79-020, Revised March 1983.
ND: Not Detected. If present, the concentration is less than the MDL - Method Detection Limit
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Reviewed By:______________________
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DATE REPORTED: 06/27/08
AC&S LAB ID# 9964616

VOLATILE ANALYSIS - METHOD 8260B

PARAMETER	METHOD#	TIME	DATE	ANALYST	MDL	CONCENTRATION
ACETONE (67-64-10	8260B	03:07	06/27/08	RLK	0.03mg/kg	1.73mg/kg
CARBON DISULFIDE (75-15-0)	8260B	03:07	06/27/08	RLK	0.01mg/kg	1.89mg/kg
IODOMETHANE (74-88-4)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
2-BUTANONE (78-93-3)	8260B	03:07	06/27/08	RLK	0.05mg/kg	1.16mg/kg
BENZENE (71-43-2)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
BROMOBENZENE (108-86-1)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
BROMODICHLOROMETHANE (75-27-4)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
BROMOFORM (75-25-2)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
N-BUTYLBENZENE (104-51-8)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
SEC-BUTYLBENZENE (135-98-8)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
TERT-BUTYLBENZENE (98-06-6)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
CARBON TETRACHLORIDE (56-23-5)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
2-CHLOROTOLUENE (95-49-8)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
4-CHLOROTOLUENE (106-43-4)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
DIBROMOCHLOROMETHANE (124-48-1)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
1,2-DIBROMO-3-CHLOROPROPANE (96-12-8)	8260B	03:07	06/27/08	RLK	0.05mg/kg	ND
BROMOCHLOROMETHANE (74-97-5)	8260B	03:07	06/27/08	RLK	0.04mg/kg	ND
BROMOMETHANE (74-83-9)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
CHLOROETHANE (75-00-3)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
CHLOROFORM (67-66-3)	8260B	03:07	06/27/08	RLK	0.03mg/kg	2.40mg/kg
CHLOROMETHANE (74-87-3)	8260B	03:07	06/27/08	RLK	0.05mg/kg	ND
DICHLORODIFLUOROMETHANE (75-71-8)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
1,2-DICHLOROBENZENE	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
1,3-DICHLOROBENZENE	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
1,4-DICHLOROBENZENE	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
1,1-DICHLOROETHANE (75-34-3)	8260B	03:07	06/27/08	RLK	0.06mg/kg	ND
1,2-DICHLOROETHANE (107-06-2)	8260B	03:07	06/27/08	RLK	0.03mg/kg	ND
1,1-DICHLOROETHENE (75-35-4)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
C-1,2-DICHLOROETHENE (156-59-2)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
T-1,2-DICHLOROETHENE (156-60-5)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
2,2-DICHLOROPROPANE (594-20-7)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
METHYLENE CHLORIDE (75-09-2)	8260B	03:07	06/27/08	RLK	0.05mg/kg	3.43mg/kg
TRICHLOROETHENE (79-01-6)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
TRICHLOROFLUOROMETHANE (75-69-4)	8260B	03:07	06/27/08	RLK	0.02mg/kg	ND
VINYL CHLORIDE (75-01-4)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
1,2-DIBROMOETHANE (106-93-4)	8260B	03:07	06/27/08	RLK	0.03mg/kg	ND
DIBROMOMETHANE (74-95-3)	8260B	03:07	06/27/08	RLK	0.04mg/kg	ND
1,2-DICHLOROPROPANE (78-87-5)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
1,3-DICHLOROPROPANE (142-28-9)	8260B	03:07	06/27/08	RLK	0.03mg/kg	ND
1,1-DICHLOROPROPENE (563-58-6)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
C-1,3-DICHLOROPROPENE (10061-01-5)	8260B	03:07	06/27/08	RLK	0.01mg/kg	ND
T-1,3-DICHLOROPROPENE (10061-02-6)	8260B	03:07	06/27/08	RLK	0.03mg/kg	ND
ISOPROPYLBENZENE (98-82-8)	8260B	03:07	06/27/08	RLK	0.02mg/kg	0.70mg/kg
P-ISOPROPYLTOLUENE (98-82-8)	8260B	03:07	06/27/08	RLK	0.02mg/kg	2.10mg/kg

CEMEX, INC
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AC&S LAB ID# 9964616

VOLATILE ANALYSIS - METHOD 8260B

PARAMETER	METHOD #	TIME	DATE	ANALYST	MDL	CONCENTRATION
1,1,1-TRICHLOROETHANE (71-55-6)	8260B	3:07	06/27/08	RLK	0.01mg/kg	ND
N-PROPYLBENZENE (103-65-1)	8260B	3:07	06/27/08	RLK	0.03mg/kg	0.95mg/kg
1,1,2-TRICHLOROETHANE (79-00-5)	8260B	3:07	06/27/08	RLK	0.03mg/kg	ND
1,2,3-TRICHLOROBENZENE (87-61-6)	8260B	3:07	06/27/08	RLK	0.02mg/kg	ND
1,2,4-TRICHLOROBENZENE (120-82-1)	8260B	3:07	06/27/08	RLK	0.02mg/kg	ND
1,2,4-TRIMETHYLBENZENE (95-63-6)	8260B	3:07	06/27/08	RLK	0.02mg/kg	6.08mg/kg
1,3,5-TRIMETHYLBENZENE (108-67-8)	8260B	3:07	06/27/08	RLK	0.02mg/kg	2.24mg/kg
T-1,4-DICHLORO-2-BUTENE (110-57-6)	8260B	3:07	06/27/08	RLK	0.02mg/kg	ND
ETHYLBENZENE (100-41-4)	8260B	3:07	06/27/08	RLK	0.01mg/kg	0.83mg/kg
STYRENE (100-42-5)	8260B	3:07	06/27/08	RLK	0.01mg/kg	11.85mg/kg
1,1,1,2-TETRACHLOROETHANE (630-20-6)	8260B	3:07	06/27/08	RLK	0.01mg/kg	ND
1,1,2,2-TETRACHLOROETHANE (79-34-5)	8260B	3:07	06/27/08	RLK	0.04mg/kg	ND
TETRACHLOROETHENE (127-18-4)	8260B	3:07	06/27/08	RLK	0.02mg/kg	ND
TOLUENE (108-88-3)	8260B	3:07	06/27/08	RLK	0.01mg/kg	0.41mg/kg
1,2,3-TRICHLOROPROPANE (96-18-4)	8260B	3:07	06/27/08	RLK	0.03mg/kg	ND
2-HEXANONE (591-78-6)	8260B	3:07	06/27/08	RLK	0.05mg/kg	2.35mg/kg
CHLOROBENZENE (108-90-7)	8260B	3:07	06/27/08	RLK	0.01mg/kg	ND
4-METHYL-2-PENTANONE (108-10-1)	8260B	3:07	06/27/08	RLK	0.05mg/kg	ND
O-XYLENES (95-47-6)	8260B	3:07	06/27/08	RLK	0.02mg/kg	0.83mg/kg
M/P-XYLENES (108-38-3 / 106-42-3)	8260B	3:07	06/27/08	RLK	0.02mg/kg	1.51mg/kg
TOTAL XYLENES	8260B	3:07	06/27/08	RLK	0.04mg/kg	2.34mg/kg

SURROGATE RECOVERY	% RECOVERY
DIBROMOFLUOROMETHANE	-------
TOLUENE-d8	65%
BROMOFLUOROBENZENE	112%

*SAMPLE WAS RECEIVED BY LAB OUT OF HOLDING TIME.

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• Certificate Number 010 for DEP of West Virginia.

Reviewed By:____________________________
PRISCILLA VASSAR

TEST REPORT

ENGINEERED FUEL TRIAL BURN
EMISSIONS EVALUATION

KILN 3

CEMEX
WAMPUM, PENNSYLVANIA

BLUE MOUNTAIN PROJECT 1554

AUGUST 7, 2007

PREPARED BY
PAUL JADLOWIEC
DIVISION MANAGER-SOURCE TESTING

BLUE MOUNTAIN ENVIRONMENTAL MANAGEMENT CORPORATION
1191 PITTSBURGH ROAD
VALENCIA, PENNSYLVANIA 16059

STATEMENT OF COMPLETENESS

The information contained herein has been reviewed and all testing requirements required by PADEP have been incorporated in this Test Report. To the best of our knowledge the information contained herein conforms to all PADEP and EPA regulations applicable to the source being tested.

Test Team On-site Supervisor

Paul Jadlowiec

Signature
Paul Jadlowiec
Division Manager

Aug 7, 2007

Date

Source Representative

Melanie Lloyd

Signature
Melanie Lloyd
Plant Environmental Manager

8-13-07

Date

TABLE OF CONTENTS

FIGURE

Sampling Location

APPENDICES

Appendix A	**Field Data Sheets**
Appendix B	**Process Data**
Appendix C	**Laboratory Data**
Appendix D	**Calculations**
Appendix E	**Calibration Data**

1.0 EXECUTIVE SUMMARY

CEMEX contracted Blue Mountain Environmental Management Corporation (Blue Mountain) to perform an emission evaluation at Kiln 3 exhaust duct located at the Wampum, Pennsylvania facility. The emission evaluation was conducted during a trial burn. During the trial burn, Kiln 3 operated using an engineered fuel as a supplement to the coal fired kiln. Testing and analyses were conducted using the principles of U.S. Environmental Protection Agency (EPA) Methods as described in 40 CFR, Part 60, Appendix A and the Pennsylvania Department of Environmental Protection (PADEP) *Source Testing Manual.* The emission results are to demonstrate compliance with 40 CFR 63 Subpart LLL. Sampling was conducted for particulate, condensible particulate, volatile organic compounds (VOC), particulate under10 microns (PM10) and particulate under 2.5 microns (PM2.5). Table 1 summarizes the average emission results of three sample runs.

Blue Mountain Contact: (including gravimetric particulate analytical)	Paul Jadlowiec Blue Mountain Management Corporation 1191 Pittsburgh Road Valencia, Pennsylvania 16059 Phone: (724) 898-4500 Fax: (724) 898-2908
CEMEX Contact:	Ms. Melanie Lloyd Plant Environmental Manager CEMEX 2001 Portland Park Wampum, Pennsylvania 16167 Telephone: (724) 535-4311 ext. 364 Facsimile: (724) 535-3008
Laboratory Contact:	Nancy Kotsko Air Quality Services 4527 Clairton Boulevard Pittsburgh, Pennsylvania 15236 Telephone: (412) 881-5630 Facsimile: (412) 881-7925

2.0 SCOPE AND OBJECTIVES

The scope of this project was to determine particulate, condensible particulate, PM10, PM2.5 and VOC emissions from Kiln 3 using the principles of EPA Methods 5, 201A/202, 25A and the PADEP *Source Testing Manual.*

Testing was conducted during a trial burn. Kiln 3 operated during the trial burn using an engineered fuel as a fuel supplement. Kiln 3 has a separate exhaust from Kilns 1 and 2 and the emission testing was conducted in a duct after the electrostatic precipitator and before entering the common stack that exhausts the three kiln emissions. The test results are intended to determine compliance with 40 CFR 63 Subpart LLL.

The following parameters were determined at a minimum for three test runs:

• Gas Flow	acfm[1] and dscfm[2]
• Gas Temperature	^{o}F[3]
• Gas Moisture	% by volume
• Sample Gas Volume	dscf[4]
• Isokinetic Ratio	%
• Particulate Emission	gr/dscf[5], lb/hr[6] and lb/ton[7]
• PM10 and PM2.5 Emissions	gr/dscf, lb/hr and lb/ton
• Condensible Emissions	gr/dscf, lb/hr and lb/ton
• Volatile Organic Compound Emissions	ppm[8], lb/hr and lb/ton as propane
• Kiln Feed Rate	ton/hr[9]

The testing was conducted over two days, July 11 and 12, 2007. The Blue Mountain test personnel consisted of Messrs. Paul Jadlowiec, Doug Leighty, Matt Jadlowiec and Paul Jadlowiec. Ms. Melanie Lloyd served as company liaison.

[1]acfm	actual cubic feet per minute
[2]dscfm	dry standard cubic feet per minute
[3] ^{o}F	degrees Fahrenheit
[4]dscf	dry standard cubic feet
[5]gr/dscf	grains per dry standard cubic feet
[6]lb/hr	pounds per hour
[7]lb/ton	pounds per ton of feed
[8]ppm	parts per million
[9]ton/hr	tons of hour

3.0 PROCESS DESCRIPTION

CEMEX manufactures cement products from three kilns referred to as Kilns 1, 2 and 3. Allis Chalmers manufactured the Kilns and each is a rotary portland cement kiln that has the capability of using coal and fuel oil for combustion. Each kiln has a heat input rating of approximately 200 million British thermal units per hour and a maximum design production capacity of approximately 60 tons per hour of clinker product.

The exhaust gas stream from each kiln exits to a dry electrostatic precipitator (ESP). Research Cottrell/Enelco manufactured the ESPs. The gas streams are exhausted using induced draft (ID) fans. The ID fans are rated at 20 to 40 horsepower per unit with a maximum gas flow capacity of 90,000 to 133,000 cubic feet per minute. After particulate control through the ESPs, the exhaust gas streams exit to the atmosphere by a common 293-foot stack (Kiln Stack).

CEMEX conducted this trial to beneficially burn engineered non-hazardous fuel as a fuel supplement to the kiln operation. The non-hazardous engineered fuel was blended by VEXOR Technology.

The engineered fuel was hauled by a truck from a VEXOR Technology facility located in Medina, Ohio. The engineered fuel was pneumatically fed to a bin were it was mixed with the coal and fed into the kiln. The flame is 60 to 90 feet long and the fuel enters at a point that is 2600 degrees F. Retention time of the engineered fuel in the kiln was approximately 40 to 60 minutes.

4.0 PROCEDURES

4.1 FIELD WORK

4.1.1 Field Data Sheets

Copies of field data sheets are provided in Appendix A.

4.1.2 Emission Testing Station and Traverse Locations

The sampling station is located at a former exhaust stack of kiln 3. The stack is now used as a duct to exhaust to a common stack that exhausts the emissions from three kilns. Four test ports are located 90 degrees to center at a stack-sampling platform. The inside diameter of the stack at the sampling ports is 80.25 inches. The nearest upstream disturbance is the inlet plenum from the induced draft fan and is 38 feet 2 inches or 5.71 diameters from the test location. The nearest downstream disturbance is an elbow to the common stack which is 7 feet 4 inches or 1.10 diameters from the test location. For the particulate testing, EPA Method 1- Sample and Velocity Traverses for Stationary Sources was used to determine the number and location of the traverse points. Twenty-four sampling points were used, twelve on each diameter, six at each of the four test ports located 90 degrees to center. The following were the traverse point location from the inner wall of the stack: 2.1, 6.7, 11.8, 17.7, 25.0 and 35.6 inches. For the PM10/2.5 and condensible particulate testing, EPA Method 1was used to determine the number and location of the traverse points. Twelve sampling points were used, six on each diameter, three at each of the four test ports located 90 degrees to center. The following were the traverse point location from the inner wall of the stack: 3.5, 11.8 and 23.8 inches.

A schematic of the sampling location is provided the attached Figure.

4.1.3 Determination of Gas Flow and Gas Temperature

The gas flow rate and temperature profiles for the gas stream were measured by conducting simultaneous velocity and temperature traverses concurrently with the emission sampling. Gas velocity head was measured with a calibrated "S"-type Pitot tube that was connected to an inclined manometer. A chrome-alumel thermocouple attached to a digital indicator was used to measure the gas temperature at each of the traverse points. The gas flow and gas temperature measurements followed the principles of EPA Method 2-Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube). The gas flow measured during the particulate emission sampling was used to calculate the VOC emissions on a mass basis.

An angular flow test was conducted and the average angle of flow was 5.9 degrees.

4.1.4 Determination of Dry Molecular Weight

The oxygen and carbon dioxide contents of the gas stream were measured during the particulate and VOC emission sampling using the principles of EPA Method 3A-Gas Determination of Oxygen (O_2) and Carbon Dioxide (CO_2) Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure). A gas sample was continuously extracted from the exhaust stack using a heated Teflon sample line and a portion of the sample was conveyed to two analyzers. The O_2 and CO_2 concentrations were used to calculate the molecular weight of the stack gas for the determination of exhaust gas flow rate.

A Fyrite analyzer was used to determine the molecular weight of the flue gas for the measurement of gas flow during the PM10/2.5 and condensable particulate sampling runs. Three grab samples were collected during each sample run using the principles of EPA Method 3-Gas Analysis for The Determination of Dry Molecular Weight. The following parameters were measured: percent by volume of carbon dioxide (CO_2), percent by volume (O_2) and percent nitrogen (N_2) was determined by difference.

4.1.5 Determination of Moisture Content

Moisture sampling was conducted using the principles presented in EPA Method 4-Determination of Moisture Content in Stack Gases concurrently with the emissions sampling. Parameters evaluated in order to determine the gas stream moisture content were: sample gas volume, sample gas temperature, sample gas pressure, impinger moisture gain, and silica gel moisture gain.

4.1.6 Determination of Particulate Emissions

EPA Method 5-Determination of Particulate Matter Emissions from Stationary Sources and the methodology described in the PADEP *Source Testing Manual* were used to measure particulate emissions. Particulate matter was withdrawn isokinetically from the gas stream at the stack platform and collected on a glass fiber filter and stainless steel-lined probe and nozzle. A series of glass impingers containing distilled water and silica gel collected water vapor. The impinger train consisted of two impingers containing distilled water. The third impinger was dry. The fourth impinger contained approximately 200 grams of silica gel. The impinger content volumes were measured after sampling to determine the moisture pickup. A calibrated dry gas meter measured the gas sample volumes. The sampling run volumes for Runs 1, 2 and 3 were 61.042, 58.268 and 47.033 dscf, respectively. Run 3 was below (47.033 dscf) the 50 dscf PADEP minimum because of lower than expected exhaust gas velocity. The average of three 72-minute sample runs constituted the test.

4.1.7 Determination of PM10 and PM2.5 and Condensable Emissions

EPA Methods 201A -Determination of PM10 Emissions (Constant Sampling Rate Procedure), EPA Method 202-Determination of Condensable Particulate Emissions from Stationary Sources and the methodology described in the PADEP *Source Testing Manual* was used to measure PM10, PM2.5 and condensable emissions. Particulate matter was withdrawn isokinetically from the gas stream at the stack platform and collected in a cyclonic separation apparatus that sized the particulate to PM10 and PM2.5. The probe liner after the PM10/2.5 device was glass. A series of glass impingers containing distilled water and silica gel collected condensibles and water vapor. The impinger train consisted of three Smith-Greenberg impingers containing distilled water. The fourth impinger contained approximately 200 grams of silica gel. Immediately after completion of each sampling run the impinger trains were purged with compressed nitrogen for one hour at 20 liters per minute. The impinger content volumes were measured after sampling to determine the moisture pickup. A calibrated dry gas meter measured the gas sample volume. The average of three 69.0 to 76.5-minute sample runs constituted the test.

4.1.8 Determination of Volatile Organic Compound Emissions

The principles of EPA Method 25A- Determination of Total Organic Concentration Using a Flame Ionization Analyzer were used for this test program. A gas sample was continuously extracted from Kiln 3 exhaust and a portion of the sample was conveyed to an analyzer. The analyzer measured the VOC concentration using the principles of flame ionization detection. The average of three 60-minute sample runs constituted the test at each source. Each test run was conducted within the same particulate sampling time periods. The VOC emission results were reported as propane that was the calibration gas used to calibrate the instrument.

4.1.9 Process Data

The process data contained in Appendix B includes a summarization of the raw material and coal feed rate to the kiln. VEXOR Technology engineered fuel usage report and a summary of Kiln 3 ESP operating data is also included in Appendix B

4.1.10 Sample Recovery Procedures

Recoveries of samples were conducted on-site in the Blue Mountain Mobil Laboratory in accordance with EPA Methods 5, 201A and 202 procedures.

4.2 LABORATORY ANALYSES

Blue Mountain conducted all gravimetric analysis in accordance with EPA Method 5 and 201A. Blue Mountain's PADEP Laboratory Registration Number is 10-3211.

Air Quality Sciences conducted all the condensible analyses in accordance with EPA Method 202. The total condensible particulate mass was calculated using Equation 202-3 Post Ammonium Chloride Subtraction. Air Quality Sciences PAPEP laboratory registration Number is 02-711.

Copies of the laboratory reports are contained in Appendix C.

4.3 CALCULATIONS

Emission calculations were completed using a computer spreadsheet format. The results of each pertinent parameter are detailed on the spreadsheet for each sampling run and are contained in Appendix D. Sample calculations are included.

4.4 FIELD EQUIPMENT CALIBRATIONS

The following field equipment calibration data are contained in Appendix E:

Pitot tubes;
Thermocouples;
Dry gas meters and orifices;
Nozzles, and
VOC analyzer.

5.0 RESULTS

5.1 PARTICULATE EMISSIONS

Table 2 summarizes the results of the particulate emission testing. The particulate emission concentrations for Runs 1, 2 and 3 were 0.0088, 0.0112 and 0.0158 gr/dscf, respectively. The average emission concentration was 0.0119 gr/dscf. The particulate emissions measured on a mass basis were 4.1, 5.1 and 5.8 lb/hr, respectively. The average particulate mass emission rates were 5.0 lb/hr or 0.106 lb/ton.

5.2 CONDENSIBLE EMISSIONS

Table 3 summarizes the results of the condensible emission testing.

The total inorganic and organic condensible emission concentrations for Runs 1, 2 and 3 were 0.0361, 0.0522 and 0.0373 gr/dscf, respectively. The average emission concentration was 0.0419 gr/dscf. The total condensible emissions measured on a mass basis were 15.5, 21.0 and 14.4 lb/hr, respectively. The average mass emission rates were 17.3 lb/hr or 0.325 lb/ton.

5.3 PM10 and 2.5 EMISSIONS

Table 3 summarizes the results of the PM10 and PM2.5 emission testing. PM10 and PM2.5 emission testing was conducted concurrently with condensable emission testing.

The PM10 emission concentrations for Runs 1, 2 and 3 were 0.0333, 0.0454 and 0.0710 gr/dscf, respectively. The average emission concentration was 0.0419 gr/dscf. The PM10 emissions measured on a mass basis were 14.2, 18.3 and 29.3 lb/hr, respectively. The average PM10 mass emission rates were 20.6 lb/hr or 0.386 lb/ton. Ninety-five and eight-tenths percent (95.8 %) of the particulate captured in the PM10/2.5 sampling train was PM10.

The PM2.5 emission concentrations for Runs 1, 2 and 3 were 0.0283, 0.0404 and 0.0639 gr/dscf, respectively. The average emission concentration was 0.0442 gr/dscf. The PM2.5 emissions measured on a mass basis were 12.1, 16.3 and 26.4 lb/hr, respectively. The average PM2.5 mass emission rates were 18.3 lb/hr or 0.342 lb/ton. Eighty-four and three-tenths percent (84.3 %) of the particulate captured in the PM10/2.5 sampling train was PM2.5.

5.4 VOC EMISSIONS

Table 2 also summarizes the results of the VOC emission testing. VOC emission testing was conducted within the same time periods as the particulate emission testing.

The VOC emission concentrations for Runs 1, 2 and 3 were 16.8, 20.0 and 26.5 ppm, respectively. The average emission concentration was 21.1 ppm. The VOC emissions measured on a mass basis were 8.1, 9.1 and 9.8 lb/hr, respectively. The average VOC mass emission rates were 9.0 lb/hr or 0.190 lb/ton, as propane.

TABLES

TABLE 1

CEMEX
WAMPUM PLANT
KILN 3
ENGINEERED FUEL TRIAL

SUMMARY OF AVERAGE EMISSION RESULTS

JULY 11 AND 12, 2007

Parameter	Average
Particulate Emissions:	
gr/dscf	**0.0119**
lb/hr	**5.0**
lb/ton	**0.106**
Condensible Emissions:	
gr/dscf	**0.0419**
lb/hr	**17.3**
lb/ton	**0.325**
PM10 Emissions:	
gr/dscf	**0.0499**
lb/hr	**20.6**
lb/ton	**0.386**
% PM10 of Total Paticulate Measured[1]	**95.8**
PM2.5 Emissions:	
gr/dscf	**0.0442**
lb/hr	**18.3**
lb/ton	**0.342**
% PM2.5 of Total Paticulate Measured[2]	**84.3**
VOC Emissions (as propane):	
ppm	**21.1**
lb/hr	**9.0**
lb/ton	**0.190**

1-Percent of PM10 emissions measured in the PM10/2.5 sampling train compared to total particulate measured in the PM10/2.5 sampling train.
2-Percent of PM2.5 emissions measured in the PM10/2. sampling train compared to total particulate measured in the PM10/2.5 sampling train.

TABLE 2

CEMEX
WAMPUM PLANT
KILN 3
ENGINEERED FUEL TRIAL

PARTICULATE AND VOC EMISSION SUMMARY

July 11, 2007

Parameter	Run 1	Run 2	Run 3	Average
Gas flow, acfm	106808	99874	80780	**95821**
Gas flow, dscfm	54220	52862	42881	**49988**
Gas temperature, °F	324.6	318.4	312.6	**318.5**
Gas moisture, % by volume	22.6	19.8	20.3	**20.9**
Oxygen content, % by volume	9.6	10.8	10.6	**10.3**
Carbon dioxide content, % by volume	16.5	15.8	14.3	**15.5**
Sample volume, dscf	61.042	58.268	47.033	**55.448**
Isokinetic ratio, %	101.5	99.4	99.0	**100.0**
Particulate Emissions:				
gr/dscf	0.0088	0.0112	0.0158	**0.0119**
lb/hr	4.1	5.1	5.8	**5.0**
lb/ton	0.082	0.106	0.131	**0.106**
VOC Emissions (as propane):				
ppm	16.8	20.0	26.5	**21.1**
lb/hr	8.1	9.1	9.8	**9.0**
lb/ton	0.161	0.188	0.221	**0.190**

TABLE 3

CEMEX
WAMPUM PLANT
KILN 3
ENGINEERED FUEL TRIAL

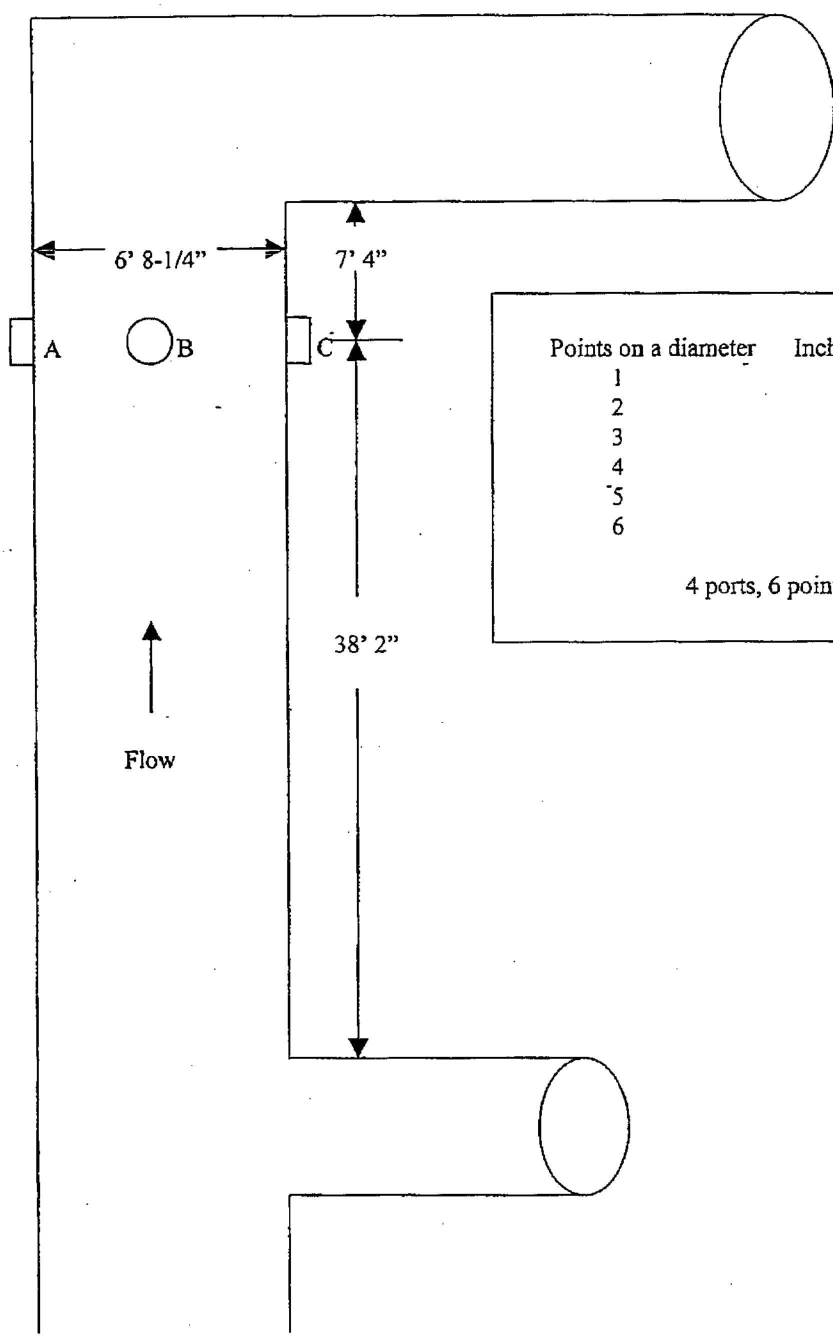
CONDENSIBLE, PM10 AND PM2.5 EMISSION SUMMARY

July 12, 2007

Parameter	Run 1	Run 2	Run 3	Average
Gas flow, acfm	92077	88283	93109	**91156**
Gas flow, dscfm	49968	46960	48100	**48343**
Gas temperature, °F	316.9	310.2	313.8	**313.6**
Gas moisture, % by volume	18.6	20.9	22.9	**20.8**
Oxygen content, % by volume	12.0	11.0	11.0	**11.3**
Carbon dioxide content, % by volume	17.0	17.0	17.0	**17.0**
Sample volume, dscf	23.255	21.222	22.599	**22.359**
Isokinetic ratio, %	101.9	108.7	101.9	**104.2**
Total Condensible Emissions:				
gr/dscf	0.0361	0.0522	0.0373	**0.0419**
lb/hr	15.5	21.0	14.4	**17.3**
lb/ton	0.306	0.383	0.286	**0.325**
PM10 Emissions:				
gr/dscf	0.0333	0.0454	0.0710	**0.0499**
lb/hr	14.3	18.3	29.3	**20.6**
lb/ton	0.282	0.333	0.543	**0.386**
% PM10 of Total Paticulate Measured	92.0	98.3	97.1	**95.8**
PM2.5 Emissions:				
gr/dscf	0.0283	0.0404	0.0639	**0.0442**
lb/hr	12.1	16.3	26.4	**18.3**
lb/ton	0.240	0.297	0.489	**0.342**
% PM2.5 of Total Paticulate Measured	78.2	87.4	87.4	**84.3**

FIGURE

Cemex
Kiln 3 Outlet Duct
Wampum, Pennsylvania



Points on a diameter	Inches from inner stack wall
1	1.7
2	5.4
3	9.5
4	14.2
5	20.1
6	28.6

4 ports, 6 points per port