KOOGLER & ASSOCIATES, INC.
ENVIRONMENTAL SERVICES
4014 NW 13th STREET
GAINESVILLE, FL 32609-1923
352/377-5822 ▪ FAX/377-7158

October 25, 2012

Syed Arif, Administrator
Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blair Stone Road MS 5510
Tallahassee, FL 32399-2400

Subject: ***Florida Rock Industries, Inc.***
Thompson S. Baker Cement Plant
Permit No. 0010087-041-AV
Use of an Alternative Raw Material

Dear Syed:

This letter is being submitted as notice of the use of an alternative limestone ($CaCO_3$) bearing raw material to replace a portion of the on-site mined limestone currently used by Florida Rock Industries, Inc. (FRI) at their Thompson S. Baker Cement Plant in Newberry, Florida. The alternative raw material is a lime residual that is a by-product of the softening of potable water by Gainesville (Florida) Regional Utilities. This material will be used to replace up to approximately five percent of the limestone in the raw material feed used by FRI. This letter is being submitted in accordance with Rule 62-213.410, *Changes without permit revision.* As required by this Rule, a copy of this letter is also being forwarded to EPA Region 4 in Atlanta. In the following paragraphs, the alternative raw material and its use will be described and a regulatory analysis of its use will be provided.

Project Description

The FRI Thompson S. Baker Cement Plant complex includes two dry-process, preheater/precalciner cement plants, the supporting infrastructure and a quarry that supplies limestone and overburden materials used in the raw material feed to the two kiln systems. The kiln systems are a 2650 tpd (clinker) kiln permitted in 1995 and a 3000 tpd kiln permitted in 2005. The facility is currently operating under Title V Permit 0010087-041-AV.

The raw materials fed to kiln systems for the production of clinker include limestone and other materials representing sources of iron, alumina and silica. At the FRI Thompson S. Baker Cement Plant, the limestone is mined on-site as is overburden materials that provide silica and alumina for the raw material feed. Typically, limestone constitutes 80-85 percent of the raw materials in the raw materials feed. FRI will be replacing up to approximately five percent of this limestone with lime residuals produced during the softening of potable water by Gainesville Regional Utilities. In the following paragraphs, the characteristics of the lime residuals are described.

Gainesville Regional Utilities (GRU) provides potable water to the City of Gainesville, Florida and surrounding communities. The water is pumped from the Floridan Aquifer and requires softening prior to distribution. The softening is accomplished by adding hydrated lime ($Ca(OH)_2$) to the raw water. The hydrated lime is supplied to GRU by Carmeuse Lime and Stone and is produced from high calcium limestone that contains in excess of 98 percent calcium carbonate.

The water softening process is described in Attachment A. Basically the softening process involves the addition of hydrated lime to react with carbon dioxide, calcium and magnesium carbonate hardness and calcium and magnesium non-carbonate hardness in the raw potable water. The insoluble by-products of these reactions include calcium carbonate, magnesium carbonate and magnesium hydroxide. These insoluble compounds precipitate from the treated water and produce the lime residuals that FRI will use as an alternative raw material.

It should be noted, that GRU does not use soda ash or caustic soda in their water softening process. It should also be noted that the softening process that produces the lime residuals is the softening of a public potable water; thus, there will be no toxics or organic compounds associated with the process or lime residuals.

The chemical characteristics of the lime residuals are documented in Attachment B. The analytical data provided in Attachment B show that the characteristics of the lime residuals are very similar to the characteristics of typical Central Florida limestone (Attachment C). A separate analysis showed the lime residuals have a petroleum hydrocarbon concentration of approximately 7 ppm. This compares with petroleum hydrocarbon concentrations in raw materials currently used by FRI of 5-13 ppm.

Based on the analytical characteristics of the lime residuals and the source of the residuals, there is nothing that would preclude their use as a partial replacement of the limestone currently used as a raw material by FRI.

Regarding the handling of the material, FRI will receive up to twenty 25-ton truck loads of the residuals per day. The residuals will be delivered to the FRI quarry and will replace up to approximately five percent of the limestone currently supplied by the quarry. The lime residuals will be mixed with mined limestone through the existing quarry crusher to produce quarry mix. This mix will be delivered by conveyor to the raw materials storage building where it will be blended with other raw materials to produce the raw materials feed to the raw mills and subsequently to the kiln systems. The use of the lime residuals will have no effect on the physical or chemical characteristics of the raw material mix, on the operation of the raw mills or kiln systems, on the production rates of the kilns or on the emissions rate of any air pollutant emitted from the kiln systems.

Regulatory Analysis

The notification of the use of this alternative raw material is being submitted in accordance with Rule 62-213.410, F.A.C. This Rule allows for a Title V facility that has a valid permit to make certain operating changes without permit revision. Operating changes authorized under this Rule are defined by Rule 62-210.200(227), F.A.C. as any physical change to, or change to the operation of any Title V source, or any emission unit within a Title V source that contravenes a permit term or condition other than one of the conditions described at paragraphs 62-213.400(2)(a)-(j), F.A.C.; but that does not constitute a modification and does not otherwise subject the source to a requirement for permit revision pursuant to Rule 62-213.400, F.A.C.

The use of the alternative raw material by FRI meets the definition of an "operating change" except that the use of the material does not contravene any permit condition, let alone, any of the conditions defined in Rule 62-213.400(2)(a)-(j), F.A.C. Notwithstanding the fact that the use of the lime residuals as a raw material contravenes no permit conditions, the information related to the use of this material is provided in the format required of Rule 62-213.410, F.A.C. as a means of providing the Department and EPA with notice of the use of this material, and the opportunity to comment.

Summary of Project

The following summarizes the use of GRU lime residuals as an alternative raw material:

- The characteristics of the lime residuals (Attachment B) are very similar to the characteristics of the limestone they will replace (Attachment C). The residuals will replace up to approximately five percent of the limestone used in the raw material feed to the raw mills of either of the two kiln systems.
- There will be no change in the operation of the raw mills or kiln systems as a result of the use of the lime residuals as an alternative raw material. Neither will there be an increase in the hourly or annual through-put of the kilns nor in the hours of operation of the kilns.
- As the throughputs of the kiln systems are unchanged, there will be no changes in the production capacities of the kilns. Also, there will be no changes in fuel use by either the kilns or the calciners.
- As none of the operating characteristics or fuel use of the kilns will change, and as the characteristics of the lime residuals are very similar to the limestone they will replace,

there will be no change in the emission rate of any pollutant discharged from the kiln; either hourly or annually. Additionally, there will be no pollutants discharged from the kiln that are not presently being discharged.

- As there are no conditions in the above captioned Title V Permit related to the specific raw materials fed to the kiln systems, there are no conditions in the permit that must be changed or that are no longer applicable.
- The lime residuals have been used as a raw material substitute since June 2011, following notification to, and a response from FDEP. That correspondence is documented in Attachment D. The purpose of this follow-up correspondence is that the original notification of use was narrow in that it informed FDEP of the use of the lime residuals and requested only a determination related to the requirements for performance testing under 40 CFR 63, Subpart LLL. This follow-up correspondence is a general notification of the use of the lime residuals as an alternative raw material.

Based on the description of the lime residuals and their use as an alternative source of calcium carbonate provided herein, and the rule analysis associated with their use as outlined herein, it is our opinion that the use of the lime residuals as an alternative raw material can be accomplished without permit revision as authorized by Rule 62-213.410, FAC.

Finally, the use of lime residuals, as described herein, constitutes the beneficial reuse of an industrial byproduct. Such use of lime residuals is not specifically addressed by Department rules, as is, for example, the use of used tires and compost. Accordingly, FRI is proceeding in

reliance on the assumption that such lime residuals are exempt from regulation as solid waste pursuant to the provisions of Section 403.7045(1)(f), Florida Statutes, and Rule 62-701.220(2)(d), Florida Administrative Code and otherwise qualify as a beneficial use of the residuals in FRI's manufacturing process, instead of being disposed.

If you have a differing opinion after your review of the information provided herein, please contact me at 352 377 5822 or at jkoogler@kooglerassociates.com immediately. Thank you for your review of this project.

Very truly yours,

John B. Koogler, Ph.D., P.E.

JBK/kh

cc: Gregg Worley, USEPA Region 4, Atlanta, GA
Al Linero, FDEP, Tallahassee, FL
Mike O'Berry, Vulcan/FRI
Chris Horner, FRI
Henry Gotsch, FRI
Segundo Fernandez, OFBA

ATTACHMENT A

WATER SOFTENING WITH HYDRATED LIME

Lime Softening

Chemistry

Lime softening involves a relatively complicated series of chemical reactions which will be discussed in depth below. The goal of all of these reactions is to change the calcium and magnesium compounds in water into calcium carbonate and magnesium hydroxide. These are the least soluble calcium and magnesium compounds and thus will settle out of the water at the lowest concentrations. For example, calcium carbonate (which is essentially the same as limestone) will settle out of water at concentrations greater than 40 mg/L.

In order to produce calcium carbonate and magnesium hydroxide, the pH of the water must be raised by the addition of lime. Calcium compounds in water will be removed at a pH of about 9.0 to 9.5 while magnesium compounds require a pH of 10.0 to 10.5. When soda ash is used to remove noncarbonate hardness, an even higher pH is required - 10.0 to 10.5 for calcium compounds and 11.0 to 11.5 for magnesium compounds.

Carbon Dioxide Demand

The first step in lime softening is the addition of lime to water using a typical dry feeder, either volumetric or gravimetric. As in the chlorination process, lime reacts with substances in the water before it can begin softening the water. Carbon dioxide is the primary compound which creates the initial demand for lime. The following reaction occurs, using up carbon dioxide and lime and creating calcium carbonate and water:

$$\text{Carbon dioxide} + \text{Lime} \rightarrow \text{Calcium carbonate} + \text{Water}$$
$$CO_2 + Ca(OH)_2 \rightarrow CaCO_3 + H_2O$$

The resulting calcium carbonate precipitates out of solution.

When water, especially groundwater, has a high carbon dioxide concentration, the water is often pretreated with aeration before softening begins. Aeration removes the excess carbon dioxide and lowers the lime requirements.

Removal of Carbonate Hardness

Once the carbon dioxide demand has been met, the lime is free to react with and remove carbonate hardness from the water. Calcium compounds react with lime in the reaction shown below.

$$\text{Calcium bicarbonate} + \text{Lime} \rightarrow \text{Calcium carbonate} + \text{Water}$$
$$Ca(HCO_3)_2 + Ca(OH)_2 \rightarrow 2CaCO_3 + 2H_2O$$

We have focussed on calcium bicarbonate since it is the most common calcium compound in water, but other calcium-based hardness compounds have similar reactions. In any case, the calcium carbonate produced is able to precipitate out of solution.

Magnesium compounds have a slightly different reaction. First, magnesium bicarbonate reacts with lime and

produces calcium carbonate (which precipitates out of solution) and magnesium carbonate.

Magnesium bicarbonate + Lime → Calcium carbonate + Magnesium carbonate + Water

$$Mg(HCO_3)_2 + Ca(OH)_2 \rightarrow CaCO_3 + MgCO_3 + 2H_2O$$

Then the magnesium carbonate reacts with lime and creates more calcium carbonate and magnesium hydroxide. Both of these compounds are able to precipitate out of water.

Magnesium carbonate + Lime → Calcium carbonate + Magnesium hydroxide

$$MgCO_3 + Ca(OH)_2 \rightarrow CaCO_3 + Mg(OH)_2$$

Removal of Noncarbonate Hardness

In many cases, only the carbonate hardness needs to be removed, requiring only the addition of lime. However, if noncarbonate hardness also needs to be removed from water, then soda ash must be added to the water along with lime.

Each noncarbonate hardness compound will have a slightly different reaction. Here, we will consider the reactions of magnesium sulfate. The lime first reacts with the magnesium sulfate, as shown below:

Magnesium sulfate + Lime → Magnesium hydroxide + Calcium sulfate

$$MgSO_4 + Ca(OH)_2 \rightarrow Mg(OH)_2 + CaSO_4$$

The resulting compounds are magnesium hydroxide, which will precipitate out of solution, and calcium sulfate. The calcium sulfate then reacts with soda ash:

Calcium sulfate + Soda Ash → Calcium carbonate + Sodium sulfate

$$CaSO_4 + Na_2CO_3 \rightarrow CaCO_3 + Na_2SO_4$$

The calcium carbonate resulting from this reaction will settle out of the water. The sodium sulfate is not a hardness-causing compound, so it can remain in the water without causing problems.

Recarbonation

The reactions which remove carbonate and noncarbonate hardness from water require a high pH and produce water with a high concentration of dissolved lime and calcium carbonate. If allowed to enter the distribution system in this state, the high pH would cause corrosion of pipes and the excess calcium carbonate would precipitate out, causing scale. So the water must be **recarbonated**, which is the process of stabilizing the water by lowering the pH and precipitating out excess lime and calcium carbonate.

The goal of recarbonation is to produce **stable water**, which is water in chemical balance, containing the concentration of calcium carbonate in which it will neither tend to precipitate out of the water (causing scale) nor dissolve into the water (causing corrosion.) This goal is usually achieved by pumping carbon dioxide into the water. Excess lime reacts with carbon dioxide in the reaction shown below, producing calcium carbonate:

Lime + Carbon dioxide → Calcium carbonate + Water

$$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$$

Recarbonation also lowers the pH, which encourages the precipitation of calcium carbonate and magnesium hydroxide.

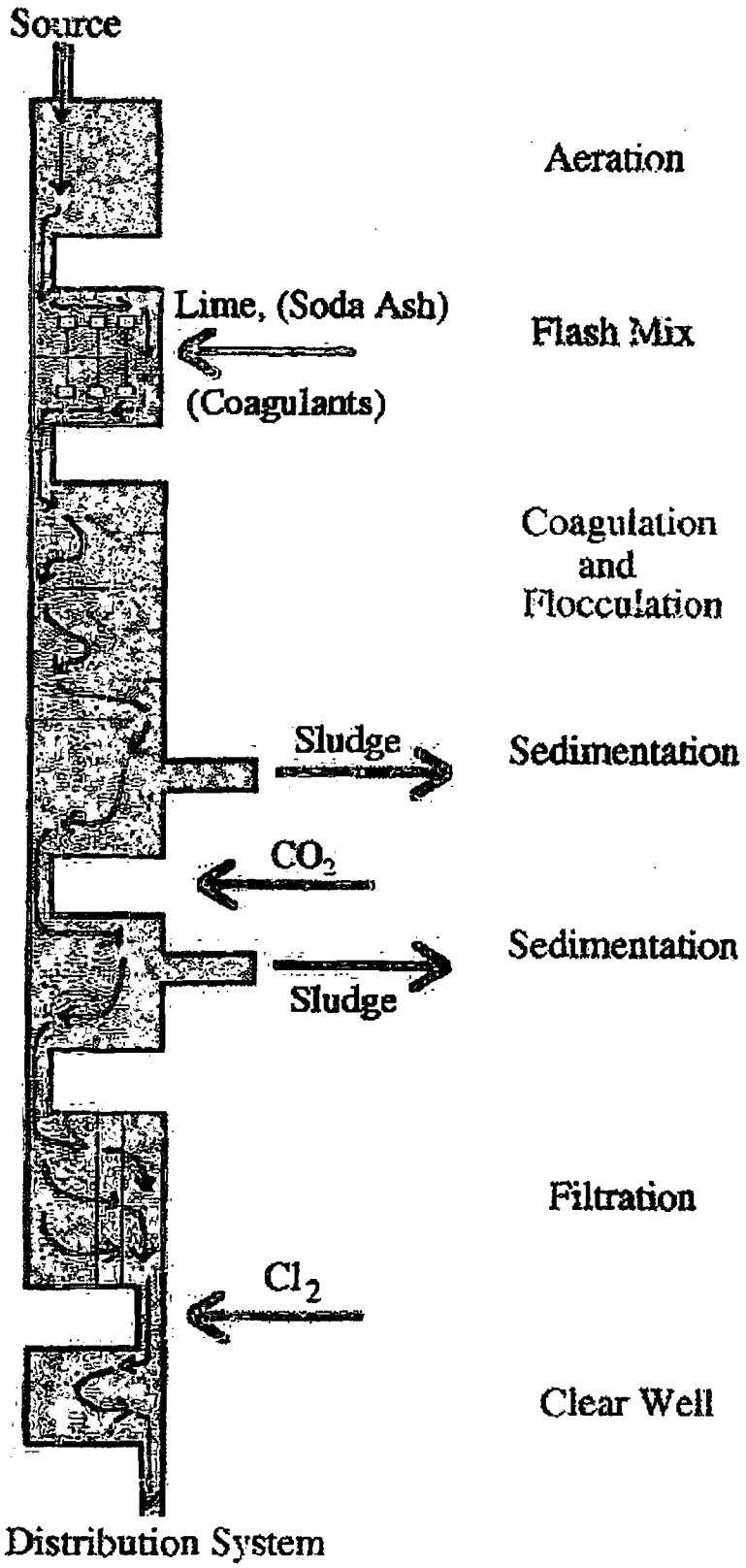
Recarbonation may occur in one step, in which the pH is lowered to about 10.4 and carbonate hardness is precipitated out. In some cases, a second recarbonation step is used to lower the pH to 9.8 and encourage yet more precipitation. In either case, the process must be carefully controlled since carbon dioxide can react with calcium carbonate and draw it back into solution as calcium bicarbonate, negating the softening process.

Alternatively, recarbonation can be achieved through the addition of acids such as sulfuric or hydrochloric acids or through polyphosphate addition. These types of recarbonation work differently from carbon dioxide addition.

In The Treatment Process

Equipment Used

Lime softening uses the equipment already found in most treatment plants for turbidity removal. An overview of the lime treatment process is shown below.


Source
Aeration
Lime, (Soda Ash)
(Coagulants)
Flash Mix
Coagulation
and
Flocculation
Sludge
Sedimentation
CO_2
Sedimentation
Sludge
Filtration
Cl_2
Clear Well
Distribution System

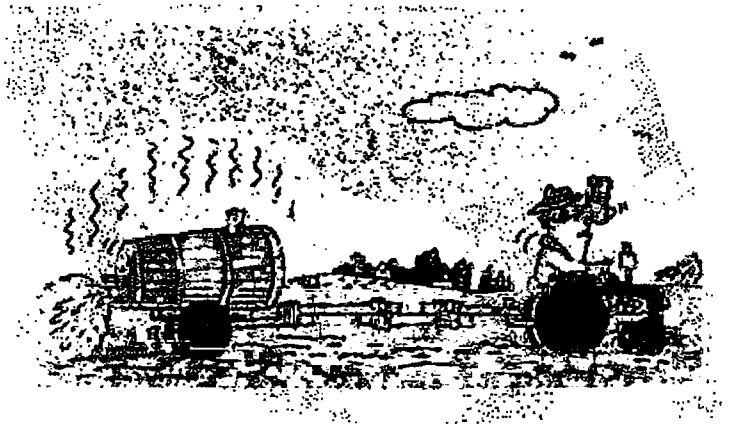
Sludge

Lime softening produces large quantities of sludge. In fact, for every pound of lime used, about two pounds of sludge are formed.

Lime sludge

The softening process usually requires two sedimentation basins, each with a detention time of 1.5 to 3 hours, to deal with the large quantities of sludge. One sedimentation basin handles the sludge resulting from lime and soda ash softening and the other sedimentation basin deals with the sludge resulting from recarbonation.

Disposal of lime sludge is the same as for sedimentation basin sludge. Landfill disposal is the most common method, although sludge may sometimes be sent to sanitary sewers. Lime sludge has a high pH and has increasingly been disposed of by applying it to agricultural land to increase the pH of acidic soils.



Monitoring

If softening problems are discovered, the cause usually lies in either chemical feeder malfunctions or source water quality changes. A variety of water characteristics can influence lime-soda ash softening:

- *Water hardness* will determine the quantity of chemicals which must be added to soften the water.
- *pH* influences the chemical reactions in the softening process. A higher pH makes the process more efficient.
- *Alkalinity* determines whether the hardness in the water is carbonate or noncarbonate hardness.
- *Temperature* influences the rate of the reaction and the amount of hardness which the water will hold.

These four water characteristics should be monitored carefully when softening water using lime. In addition, coagulants used to remove turbidity can influence the alkalinity or pH of the water, thus affecting the softening process. After softening, the **Langelier Index** of the water should be tested to ensure that the water is not corrosive. We will study the Langelier index and corrosive water in more depth in the next lesson.

Softening is especially well-suited to treating groundwater since groundwater characteristics tend to remain relatively constant. Changing water conditions require a great deal of manipulating the softening process to keep it efficient. In addition, the high turbidity found in surface water sometimes requires presedimentation prior to softening.

Chemicals Used in Lime Softening

Types of Lime

The lime used for softening comes in two forms - hydrated lime and quicklime. Both types of lime soften water in the same way, but the equipment required for the two types of lime is different.

Hydrated lime ($Ca(OH)_2$) is also known as calcium hydroxide or slaked lime. Hydrated lime can be added to water as it is without requiring any special equipment, so it is a popular choice for small water treatment plants.

In contrast, **quicklime** (CaO), also known as calcium oxide or unslaked lime, must be slaked before it is used. **Slaking** is the process of converting quicklime to hydrated lime by adding water, as shown below:

Calcium oxide + Water → Hydrated lime

$$CaO + H_2O \rightarrow Ca(OH)_2$$

Slaking requires specialized equipment. The cost of equipment and the operator time required to run the equipment usually make quicklime use uneconomical in small plants. However, since the chemical cost of quicklime is less than the cost of hydrated lime, quicklime is often used in large plants.

The slaking process can also allow a large plant to reuse a large quantity of the lime sludge produced in the softening process. First, the sludge is heated, and the calcium carbonate in the sludge produces calcium oxide:

Calcium carbonate → Calcium oxide + Carbon dioxide

$$CaCO_3 \rightarrow CaO + CO_2$$

Then the calcium oxide can be slaked and reused in the plant. Reusing lime sludge cuts down on both chemical purchase and sludge disposal costs.

Lime Handling and Storage

Operators should observe safety procedures while handling both hydrated lime and quicklime. Lime dust can be harmful when it comes in contact with the eyes, nose, or mouth, and skin contact can cause burns. As a result, operators should wear goggles and dust masks as well as protective clothing.

Both hydrated lime and quicklime can deteriorate in quality over time while in storage. In addition, storing quicklime can cause safety problems. If quicklime comes in contact with water, it begins to slake, a process which produces a great deal of heat and can cause explosions when uncontrolled. Quicklime should never be stored with alum since the quicklime will absorb water away from the alum and cause an explosion.

Soda Ash [Not used by Gainesville Regional Utilities]

Soda ash (Na_2CO_3) comes in only one form and does not require any treatment before it is added to the water. Safety issues resemble those for lime handling. Soda ash dust irritates the eyes and mucous membranes of the nose, so the operator should wear protective clothing, goggles, and a dust mask. In addition, areas in which soda ash is used should be equipped with a ventilation system to deal with the dust.

Caustic Soda [Not used by Gainesville Regional Utilities]

Caustic soda (NaOH), also known as sodium hydroxide, can replace soda ash and some of the lime in the treatment process. The treatment process using caustic soda follows the same steps as that of lime-soda ash softening.

First, carbon dioxide reacts with the caustic soda to make sodium carbonate and water.

Carbon dioxide + Caustic soda → Sodium Carbonate + Water

$$CO_2 + 2NaOH \rightarrow Na_2CO_3 + H_2O$$

Then the remaining caustic soda can react with calcium bicarbonate and magnesium bicarbonate.

Calcium bicarbonate + Caustic soda → Calcium carbonate + Soda ash + Water

$$Ca(HCO_3)_2 + 2NaOH \rightarrow CaCO_3 + Na_2CO_3 + 2H_2O$$

Magnesium bicarbonate + Caustic soda → Magnesium hydroxide + Soda ash + Water

$$Mg(HCO_3)_2 + 4NaOH \rightarrow Mg(OH)_2 + 2Na_2CO_3 + 2H_2O$$

The caustic soda can also react with magnesium noncarbonate hardness, as shown below. Also note that the reactions between caustic soda and carbonate hardness produced soda ash, which can react with noncarbonate hardness as well.

Magnesium sulfate + Caustic soda → Magnesium hydroxide + Sodium sulfate

$$MgSO_4 + 2NaOH \rightarrow Mg(OH)_2 + Na_2SO_4$$

Caustic soda has the advantages of stability in storage, lower sludge formation, and easy handling. However, safety issues still apply. Caustic soda is dangerous to the operator and can cause severe burns to the skin. As a result, rubber gloves, dusk masks, goggles, and a rubber apron should be worn while handling the chemical.

ATTACHMENT B

CHARACTERISTICS OF LIME RESIDUALS

Vulcan Materials Company
FLORIDA ROCK DIVISION

Raw Material Evaluation Form

Thompson S. Baker Plant

Name of Material: GRU Limestone Rsaiduals

Raw Material Produced or Owned By:		Raw Material Inventory or Storage Location:	
Company:	GRU - Murphree Water Treatment Plant	Company:	GRU - Murphree Water Treatment Plant
Street:	P.O. Box 147117, Sta. A122	Street:	1600 N.E. 53rd Avenue
City/State/Zip:	Gainesville, FL 32614-7117	City/State/Zip:	Gainesville, FL 32614-7117

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

This material is used in the water purifying process to supply drinker water for the residents of Gainesville. Calcium oxide (lime) is added as a de-scaling agent and is converted to calcium carbonate in the process. This lime residual material is then filtered, de-watered, and stockpiled for use. Contains about 25% moisture.

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

This material is suitable as a high calcium raw material and could be processed in through the existing quarry crushing and conveying equipment. It could also be used as a limestone additive in the finish mill without any negative effects on quality. Due to the high moisture content material handling would be the biggest problem.

This Evaluation Form Completed By:

Name:	Don Levonian
Title, Co.:	Quality Manager, Vulcan Materials Company
Street:	4000 NW CR 235
City/State:	Newberry, FL 32669
Phone:	(352) 472-4722, ext. 120

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

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

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

Chemical Compounds:

Sample ID:	3/15/2011	
Analyte:	Weight%	
SiO_2	5.66	
Al_2O_3	0.28	
Fe_2O_3	0.00	
CaO	48.70	
MgO	3.22	
SO_3	0.37	
Na_2O	0.00	
K_2O	0.00	
TiO_2	0.00	
P_2O_5	0.04	
Mn_2O_3	0.00	
Zr_2O_3	0.00	
V_2O_5	0.00	
$LOI_{(950C)}$	41.46	
Total:	99.73	
Chlorine:	0.00	ASTM C114.19
Organic Carbon		
Total Carbon		
Moisture	30.78	

Regulatory Status: (attach all confirming laboratory results)

Sample ID: T/A 660-40341-2

METALS:	TCLP Limits	TCLP	TOTAL	SW-846 Methods
Constituent	≤mg / L	mg / L	mg /Kg	Constituent Analysis
Arsenic	5.0	0.12		6010B or 7060
Barium	100.0	0.41		6010B
Cadmium	1.0	0.018		6010B
Chromium, Total	5.0	0.050		6010B
Lead	5.0	0.040		6010B
Mercury	0.2	0.00036	0.015	7741
Selenium	1.0	0.15		6010B or 7060
Silver	5.0	0.050		6010B
Antimony	none	0.090		6010B
Beryllium	none	0.018		6010B
Cobalt	none	0.040		6010B
Copper	none	0.12		6010B
Manganese	none	0.13		6010B
Nickel	none	0.12		6010B
Thallium	none	0.16		6010B or 7841
Zinc	none	0.15		6010B
Total Petroleum Hydrocarbons			7.30	FL-PRO
If Requested:		Volatile Organics:		8260B
If Requested:		Semi-Volatile Organics:		8270

SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
[Sample Preparation: TCLP Method 1131; Total Metals Method 3050]

This material is certified for use at the Thompson S. Baker Newberry Cement Plant Approve ■ Reject □

Quality Manager: [signature] 4-28-11

Production Manager: [signature]

Environmental Manager: [signature] 5/2/11

Plant Manager: [signature] 5/2/11

QuantAS Semi-Quantitative Analysis Result

File Name: LIMESTON.ASQ
File Date: 4/8/2011 8:14:18 AM
Description: LIME RESIDUAL NORTH PILE
Matrix Type: Oxide
Sample Identity: MURPHREE LIM APR/07/2011

Elements	Net Intensity (Kcps)	Concentration (%)	Normalised Concentration (%)
CaO	384.483	44.4 %	48.2 %
SiO2	14.049	5.86 %	6.36 %
MgO	9.772	2.24 %	2.43 %
Fe2O3	0.099	1.57 %	1.71 %
Al2O3	0.501	0.272 %	0.295 %
SO3	0.844	0.201 %	0.218 %
SrO	4.891	0.137 %	0.148 %
P2O5	0.204	750 ppm	810 ppm
TiO2	0.078	230 ppm	250 ppm
Cr2O3	0.013	230 ppm	250 ppm
ZrO2	0.337	99 ppm	110 ppm
Known elements:			
LOI		40.540	40.540

Film:

Binder/Flux: Aspirin
Concentration: 6.10 %
Weight: 0.325 [g]
Sample Weight: 5.000 [g]

Scan time factor: 1

Total number of elements identified: 11

Analysis total before normalisation to 100% : 95.34

11-PLM-014

?7$ARL9800-129 XP $?$FLORIDA ROCK / US 4/8/2011 8:31:6 AM

QuantAS Semi-Quantitative Analysis Result

?ile Name: LIMESTON.ASQ File Date: 4/8/2011 8:31:8 AM
Description: LIME RESIDUAL MIDDLE PILE
Matrix Type: Oxide
Sample Identity: MURPHREE LIM APR/07/2011

Elements	Net Intensity (Kcps)	Concentration (%)	Normalised Concentration (%)
CaO	345.226	41.1 %	44.7 %
SiO2	24.206	10.1 %	11.0 %
MgO	11.205	2.52 %	2.74 %
Fe2O3	0.087	1.32 %	1.43 %
Al2O3	0.433	0.233 %	0.253 %
SO3	0.900	0.227 %	0.247 %
SrO	6.054	0.162 %	0.176 %
TiO2	0.113	320 ppm	350 ppm
P2O5	0.037	140 ppm	160 ppm
ZrO2	0.249	70 ppm	76 ppm
NiO	0.049	66 ppm	72 ppm

Known elements:

LOI		39.460	39.460

Film:

Binder/Flux: Aspirin
Concentration: 6.10 %
Weight: 0.325 [g]
Sample Weight: 5.000 [g]

Scan time factor: 1

Total number of elements identified: 11

Analysis total before normalisation to 100% : 95.13

1-QAM-015
moisture => 25.05

$?$ARL9800-129 XP $?$FLORIDA ROCK / US 4/8/2011 8:47:50 AM

QuantAS Semi-Quantitative Analysis Result

File Name: LIMESTON.ASQ File Date: 4/8/2011 8:47:52 AM
Description: LIME RESIDUAL SOUTH PILE
Matrix Type: Oxide
Sample Identity: MURPHREE LIM APR/07/2011

Elements	Net Intensity (Kcps)	Concentration (%)	Normalised Concentration (%)
CaO	380.637	44.5 %	46.4 %
SiO2	16.593	7.05 %	7.35 %
MgO	11.790	2.74 %	2.86 %
Fe2O3	0.147	2.33 %	2.43 %
SO3	1.036	0.253 %	0.264 %
Al2O3	0.423	0.234 %	0.244 %
SrO	7.043	0.191 %	0.199 %
Cr2O3	0.042	740 ppm	770 ppm
TiO2	0.087	260 ppm	270 ppm
ZrO2	0.487	140 ppm	140 ppm
P2O5	0.034	130 ppm	130 ppm
K2O	0.053	55 ppm	57 ppm
Known elements:			
LOI		40.110	40.110

Film:

Binder/Flux: Aspirin
Concentration: 6.10 %
Weight: 0.325 [g]
Sample Weight: 5.000 [g]

Scan time factor: 1

Total number of elements identified: 12

Analysis total before normalisation to 100% : 97.56

11-AM-016

moisture → 2.74

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 660-40341-1

Job Description: Italian Flyash#2/GRU Dry Lime sludge

For:
Florida Rock Industries Inc.
PO BOX 459
Newberry, FL 32669

Attention: Mr. Henry Gotsch

Approved for release.
Amy Atkins
Project Manager I
3/29/2011 1:42 PM

Amy Atkins
Project Manager I
amy.atkins@testamericainc.com
03/29/2011

cc: Mr. Ralph Moon

Method: FDEP, DOH Certification #:Tampa E84282

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the TestAmerica Project Manager who signed this test report.
The estimated uncertainty associated with these reported results is available upon request.

Job Narrative
660-40341-1

Receipt
The following samples was received at the laboratory outside the required temperature criteria. Received at 20.7 degrees C.

All samples were received in good condition.

EXECUTIVE SUMMARY - Detections

Client: Florida Rock Industries Inc. Job Number: 660-40341-1

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
660-40341-1	ITALIAN FLY ASH #2				
660-40341-2	GRU DRY LIME SLUDGE				
TCLP					
Barium		0.41 J	0.50	mg/L	6010B
Manganese		0.13 J	5.0	mg/L	6010B

METHOD SUMMARY

Client: Florida Rock Industries Inc. Job Number: 660-40341-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Metals (ICP)	TAL TAM	SW846 6010B	
TCLP Extraction	TAL TAM		SW846 1311
Preparation, Total Metals	TAL TAM		SW846 3010A
Mercury (CVAA)	TAL TAM	SW846 7470A	
TCLP Extraction	TAL TAM		SW846 1311
Preparation, Mercury	TAL TAM		SW846 7470A
Mercury (CVAA)	TAL TAM	SW846 7471A	
Preparation, Mercury	TAL TAM		SW846 7471A

Lab References:

TAL TAM = TestAmerica Tampa

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Method	Analyst	Analyst ID
SW846 6010B	Fox, Greg	GF
SW846 7470A	Wieland, Kristen	KW
SW846 7471A	Wieland, Kristen	KW

SAMPLE SUMMARY

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
660-40341-1	Italian Fly Ash #2	Solid	03/22/2011 0800	03/23/2011 1105
660-40341-2	GRU Dry Lime Sludge	Solid	03/22/2011 0800	03/23/2011 1105

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Client Sample ID:	**Italian Fly Ash #2**
Lab Sample ID:	660-40341-1
Client Matrix:	Solid

Date Sampled: 03/22/2011 0800
Date Received: 03/23/2011 1105

Client: Florida Rock Industries Inc. Job Number: 660-40341-1

Client Sample ID: GRU Dry Lime Sludge

Lab Sample ID: 660-40341-2 Date Sampled: 03/22/2011 0800
Client Matrix: Solid Date Received: 03/23/2011 1105

6010B Metals (ICP)-TCLP

Method:	6010B	Analysis Batch: 660-108235		Instrument ID:	ICPA
Preparation:	3010A	Prep Batch: 660-108164		Lab File ID:	11C28A
Dilution:	5.0	Leachate Batch: 660-108162		Initial Weight/Volume:	50 mL
Date Analyzed:	03/28/2011 1145			Final Weight/Volume:	50 mL
Date Prepared:	03/25/2011 1105				
Date Leached:	03/25/2011 1100				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	MDL	PQL
Silver		0.050	U	0.050	0.50
Arsenic		0.12	U	0.12	1.0
Barium		0.41	I	0.030	0.50
Cadmium		0.018	U	0.018	0.50
Chromium		0.050	U	0.050	1.0
Lead		0.040	U	0.040	1.0
Selenium		0.15	U	0.15	0.50
Antimony		0.090	U	0.090	1.0
Beryllium		0.018	U	0.018	0.10
Thallium		0.16	U	0.16	0.25
Nickel		0.12	U	0.12	20
Copper		0.12	U	0.12	10
Zinc		0.15	U	0.15	0.50
Manganese		0.13	I	0.035	5.0
Cobalt		0.040	U	0.040	5.0

7470A Mercury (CVAA)-TCLP

Method:	7470A	Analysis Batch: 660-108247		Instrument ID:	PS200II
Preparation:	7470A	Prep Batch: 660-108221		Lab File ID:	11C28PS.PRN
Dilution:	1.0	Leachate Batch: 660-108162		Initial Weight/Volume:	25 mL
Date Analyzed:	03/28/2011 1645			Final Weight/Volume:	25 mL
Date Prepared:	03/28/2011 0930				
Date Leached:	03/25/2011 1100				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	MDL	PQL
Mercury		0.00036	U	0.00036	0.00050

7471A Mercury (CVAA)

Method:	7471A	Analysis Batch: 660-108176		Instrument ID:	PS200II
Preparation:	7471A	Prep Batch: 660-108153		Lab File ID:	11C28PS.PRN
Dilution:	1.0			Initial Weight/Volume:	0.29 g
Date Analyzed:	03/25/2011 1401			Final Weight/Volume:	50 mL
Date Prepared:	03/25/2011 0930				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	PQL
Mercury		0.015	U	0.015	0.045

DATA REPORTING QUALIFIERS

Client: Florida Rock Industries Inc. Job Number: 660-40341-1

Lab Section	Qualifier	Description
Metals		
	U	Indicates that the compound was analyzed for but not detected.
	I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

TCLP SPLPE Leachate Blank - Batch: 660-108164

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID:	LB 660-108162/1-B ^5	Analysis Batch:	660-108235	Instrument ID:	ICPA
Client Matrix:	Solid	Prep Batch:	660-108164	Lab File ID:	11C28A
Dilution:	5.0	Units:	mg/L	Initial Weight/Volume:	50 mL
Date Analyzed:	03/28/2011 1021			Final Weight/Volume:	50 mL
Date Prepared:	03/25/2011 1105				
Date Leached:	03/25/2011 1100	Leachate Batch:	660-108162		

Analyte	Result	Qual	MDL	PQL
Silver	0.050	U	0.050	0.50
Arsenic	0.12	U	0.12	1.0
Barium	0.030	U	0.030	0.50
Cadmium	0.018	U	0.018	0.50
Chromium	0.050	U	0.050	1.0
Lead	0.040	U	0.040	1.0
Selenium	0.15	U	0.15	0.50
Antimony	0.090	U	0.090	1.0
Beryllium	0.018	U	0.018	0.10
Thallium	0.16	U	0.16	0.25
Nickel	0.12	U	0.12	20
Copper	0.12	U	0.12	10
Zinc	0.15	U	0.15	0.50
Manganese	0.035	U	0.035	5.0
Cobalt	0.040	U	0.040	5.0

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

TCLP SPLPE Leachate Blank - Batch: 660-108164

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID:	LB 660-108162/7-B ^5	Analysis Batch:	660-108235	Instrument ID:	ICPA
Client Matrix:	Solid	Prep Batch:	660-108164	Lab File ID:	11C28A
Dilution:	5.0	Units:	mg/L	Initial Weight/Volume:	50 mL
Date Analyzed:	03/28/2011 1139			Final Weight/Volume:	50 mL
Date Prepared:	03/25/2011 1105				
Date Leached:	03/25/2011 1100	Leachate Batch:	660-108162		

Analyte	Result	Qual	MDL	PQL
Silver	0.050	U	0.050	0.50
Arsenic	0.12	U	0.12	1.0
Barium	0.030	U	0.030	0.50
Cadmium	0.018	U	0.018	0.50
Chromium	0.050	U	0.050	1.0
Lead	0.040	U	0.040	1.0
Selenium	0.15	U	0.15	0.50
Antimony	0.090	U	0.090	1.0
Beryllium	0.018	U	0.018	0.10
Thallium	0.16	U	0.16	0.25
Nickel	0.12	U	0.12	20
Copper	0.12	U	0.12	10
Zinc	0.15	U	0.15	0.50
Manganese	0.035	U	0.035	5.0
Cobalt	0.040	U	0.040	5.0

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Lab Control Sample - Batch: 660-108164

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 660-108164/2-A ^5
Client Matrix: Water
Dilution: 5.0
Date Analyzed: 03/28/2011 1027
Date Prepared: 03/25/2011 1105

Analysis Batch: 660-108235
Prep Batch: 660-108164
Units: mg/L

Instrument ID: ICPA
Lab File ID: 11C28A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Silver	1.00	0.993	99	75 - 125	
Arsenic	1.00	0.996	100	75 - 125	
Barium	1.00	0.940	94	75 - 125	
Cadmium	1.00	0.999	100	75 - 125	
Chromium	1.00	0.916	92	75 - 125	
Lead	1.00	0.984	98	75 - 125	
Selenium	1.00	1.01	101	75 - 125	
Antimony	1.00	1.00	100	75 - 125	
Beryllium	1.00	0.977	98	75 - 125	
Thallium	1.00	0.978	98	75 - 125	
Nickel	1.00	0.961	96	75 - 125	
Copper	1.00	1.01	101	75 - 125	
Zinc	1.00	1.01	101	75 - 125	
Manganese	1.00	0.979	98	75 - 125	
Cobalt	1.00	0.942	94	75 - 125	

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 660-108164

Method: 8010B
Preparation: 3010A
TCLP

MS Lab Sample ID:	660-40341-1	Analysis Batch: 660-108235	Instrument ID: ICPA
Client Matrix:	Solid	Prep Batch: 660-108164	Lab File ID: 11C28A
Dilution:	5.0		Initial Weight/Volume: 50 mL
Date Analyzed:	03/28/2011 1045		Final Weight/Volume: 50 mL
Date Prepared:	03/25/2011 1105		
Date Leached:	03/25/2011 1100	Leachate Batch: 660-108162	
MSD Lab Sample ID:	660-40341-1	Analysis Batch: 660-108235	Instrument ID: ICPA
Client Matrix:	Solid	Prep Batch: 660-108164	Lab File ID: 11C28A
Dilution:	5.0		Initial Weight/Volume: 50 mL
Date Analyzed:	03/28/2011 1052		Final Weight/Volume: 50 mL
Date Prepared:	03/25/2011 1105		
Date Leached:	03/25/2011 1100	Leachate Batch: 660-108162	

	% Rec.					
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Silver	101	101	75 - 125	0	20		
Arsenic	101	99	75 - 125	1	20		
Barium	95	94	75 - 125	0	20		
Cadmium	99	98	75 - 125	1	20		
Chromium	93	93	75 - 125	0	20		
Lead	98	97	75 - 125	1	20		
Selenium	112	111	75 - 125	0	20		
Antimony	105	104	75 - 125	1	20		
Beryllium	99	99	75 - 125	0	20		
Thallium	98	97	75 - 125	1	20		
Nickel	98	97	75 - 125	1	20		
Copper	102	101	75 - 125	1	20		
Zinc	101	100	75 - 125	1	20		
Manganese	99	98	75 - 125	0	20		
Cobalt	95	95	75 - 125	0	20		

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

TCLP SPLPE Leachate Blank - Batch: 660-108221

Method: 7470A
Preparation: 7470A
TCLP

Lab Sample ID:	LB 660-108162/1-C	Analysis Batch:	660-108247	Instrument ID:	PS200II
Client Matrix:	Solid	Prep Batch:	660-108221	Lab File ID:	11C28PS.PRN
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	25 mL
Date Analyzed:	03/28/2011 1617			Final Weight/Volume:	25 mL
Date Prepared:	03/28/2011 0930				
Date Leached:	03/25/2011 1100	Leachate Batch:	660-108162		

Analyte	Result	Qual	MDL	PQL
Mercury	0.00036	U	0.00036	0.00050

TCLP SPLPE Leachate Blank - Batch: 660-108221

Method: 7470A
Preparation: 7470A
TCLP

Lab Sample ID:	LB 660-108162/7-C	Analysis Batch:	660-108247	Instrument ID:	PS200II
Client Matrix:	Solid	Prep Batch:	660-108221	Lab File ID:	11C28PS.PRN
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	25 mL
Date Analyzed:	03/28/2011 1642			Final Weight/Volume:	25 mL
Date Prepared:	03/28/2011 0930				
Date Leached:	03/25/2011 1100	Leachate Batch:	660-108162		

Analyte	Result	Qual	MDL	PQL
Mercury	0.00036	U	0.00036	0.00050

Lab Control Sample - Batch: 660-108221

Method: 7470A
Preparation: 7470A

Lab Sample ID:	LCS 660-108221/2-A	Analysis Batch:	660-108247	Instrument ID:	PS200II
Client Matrix:	Water	Prep Batch:	660-108221	Lab File ID:	11C28PS.PRN
Dilution:	1.0	Units:	mg/L	Initial Weight/Volume:	25 mL
Date Analyzed:	03/28/2011 1619			Final Weight/Volume:	25 mL
Date Prepared:	03/28/2011 0930				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.00100	0.000904	90	80 - 120	

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 660-108221

Method: 7470A
Preparation: 7470A
TCLP

MS Lab Sample ID:	660-40342-B-1-D MS	Analysis Batch: 660-108247	Instrument ID: PS200II
Client Matrix:	Solid	Prep Batch: 660-108221	Lab File ID: 11C28PS.PRN
Dilution:	1.0		Initial Weight/Volume: 25 mL
Date Analyzed:	03/28/2011 1627		Final Weight/Volume: 25 mL
Date Prepared:	03/28/2011 0930		
Date Leached:	03/25/2011 1100	Leachate Batch: 660-108162	
MSD Lab Sample ID:	660-40342-B-1-E MSD	Analysis Batch: 660-108247	Instrument ID: PS200II
Client Matrix:	Solid	Prep Batch: 660-108221	Lab File ID: 11C28PS.PRN
Dilution:	1.0		Initial Weight/Volume: 25 mL
Date Analyzed:	03/28/2011 1629		Final Weight/Volume: 25 mL
Date Prepared:	03/28/2011 0930		
Date Leached:	03/25/2011 1100	Leachate Batch: 660-108162	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	86	88	80 - 120	2	20		

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Method Blank - Batch: 660-108153

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 660-108153/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 03/25/2011 1335
Date Prepared: 03/25/2011 0930

Analysis Batch: 660-108176
Prep Batch: 660-108153
Units: mg/Kg

Instrument ID: PS200II
Lab File ID: 11C25PS.PRN
Initial Weight/Volume: 0.30 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	PQL
Mercury	0.010	U	0.010	0.030

Lab Control Sample - Batch: 660-108153

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 660-108153/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 03/25/2011 1337
Date Prepared: 03/25/2011 0930

Analysis Batch: 660-108176
Prep Batch: 660-108153
Units: mg/Kg

Instrument ID: PS200II
Lab File ID: 11C25PS.PRN
Initial Weight/Volume: 0.30 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.167	0.162	97	80 - 120	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 660-108153

Method: 7471A
Preparation: 7471A

MS Lab Sample ID: 660-40353-E-1-C MS
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 03/25/2011 1345
Date Prepared: 03/25/2011 0930

Analysis Batch: 660-108176
Prep Batch: 660-108153

Instrument ID: PS200II
Lab File ID: 11C25PS.PRN
Initial Weight/Volume: 0.30 g
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 660-40353-E-1-D MSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 03/25/2011 1347
Date Prepared: 03/25/2011 0930

Analysis Batch: 660-108176
Prep Batch: 660-108153

Instrument ID: PS200II
Lab File ID: 11C25PS.PRN
Initial Weight/Volume: 0.30 g
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	101	98	80 - 120	2	20		

TestAmerica

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

660-40341

TestAmerica Tampa
6712 Benjamin Rd, Suite 100
Tampa, FL 33634
www.testamericainc.com
Phone: (813) 885 7427
Fax (813) 885 7049

Alternate Laboratory Name/Location:
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION
TESTAMERICA (LAB) PROJECT MANAGER	P.O. NUMBER: Credit Card	CONTRACT NO.
CLIENT (GRU) PM: TSB Cement - Newberry	CLIENT PHONE: 352-472-4722 x 120	CLIENT FAX: 352-472-2449
CLIENT NAME: Florida Rock Industries, Inc.	CLIENT EMAIL: levonland@vrtxmail.com	
CLIENT ADDRESS: 4000 NW CR 235, Newberry, FL 32669		
COMPANY CONTRACTING THIS WORK (if applicable)	SAMPLERS SIGNATURE	

PAGE 1 OF 1

STANDARD REPORT DELIVERY ●
DATE DUE
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE:

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G)	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT...)	REQUIRED ANALYSES: Total Mercury, Hg	TCLP Metals, As,Ba,Cd,Cr,Hg,Pb, Se,Ag,Sb,Be,Co,Cu ,Mn,Ni,Tl,Zn								NUMBER OF CONTAINERS SUBMITTED			REMARKS
3/22/2011	8:00	Italian Fly-Ash #2 - Sampled 03/08/11	G		S			1	1											
3/22/2011	8:00	GRU Dry Lime Sludge - Sampled 03/15/11	G		S			1	1											
			G		S															
			G		S															
			G		S															
			G		S															
			G		S															
			G		S															
			G		S															
			G		S															
		Sample Total						2	2								2	0		

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	3/22/11	8:15						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES NO	CUSTODY SEAL NO.	STL LOG NO.	LABORATORY REMARKS:
[signature]	3/22/11	1105	8			

NI 20.7° C GM7

FCU038:12.20.00:2

Original - Return to Laboratory with Sample(s)

Login Sample Receipt Checklist

Client: Florida Rock Industries Inc.

Job Number: 660-40341-1

Login Number: 40341
List Number: 1
Creator: McNulty, Carol

List Source: TestAmerica Tampa

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	20.7 degrees C CU-07
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

ATTACHMENT C

CHARACTERISTICS OF CENTRAL FLORIDA LIMESTONE

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Contact:
Submitter:
Date Received:

CTL Project No.:
CTL Proj. Mgr.:
Analyst:
Approved:
Date Analyzed:
Date Reported:

REPORT OF CHEMICAL ANALYSIS

Client's Sample ID:	Hole #1 29'-36.5'	Hole #1 36.5'-46.5'	Hole #1 46.5'-56.5'	Hole #1 56.5'-66.5'	Hole #1 66.5'-76.5'	Hole #1 76.5'-86.5'	Hole #1 86.5'-96.5'	Hole #1 96.5'-106.5'
Material type:	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
CTL Sample ID:	1377901	1377902	1377903	1377904	1377905	1377906	1377907	1377908
Analyte	Weight %	Weight %	Weight %	Weight %	Weight %	Weight %	Weight %	Weight %
SiO_2	0.10	0.06	0.03	0.02	0.09	<0.01	0.23	<0.01
Al_2O_3	0.03	0.12	0.08	0.02	0.07	<0.01	0.08	0.05
Fe_2O_3	0.06	0.07	0.06	0.06	0.07	0.02	0.07	0.06
CaO	55.94	56.00	55.50	54.70	55.03	54.85	55.19	55.68
MgO	0.48	0.51	0.51	0.51	0.49	0.31	0.51	0.50
SO_3	0.03	0.02	0.02	0.08	0.03	<0.01	0.03	0.04
Na_2O	0.03	0.05	0.02	0.03	0.03	0.03	0.04	0.05
K_2O	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	0.01
TiO_2	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02
P_2O_5	0.05	0.05	0.05	0.03	0.02	0.04	0.03	0.01
Mn_2O_3	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
SrO	0.01	0.02	0.02	0.02	0.02	<0.01	0.01	0.01
Cr_2O_3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
ZnO	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
L.O.I. (950°C)[2]	43.48	43.46	43.66	43.90	43.97	44.03	43.68	43.86
Total	100.21	100.39	99.98	99.40	99.83	99.31	99.89	100.30
Alkalies as Na_2O	0.03	0.06	0.02	0.03	0.03	0.03	0.04	0.06
Calculated Compounds								
Ca as $CaCO_3$	99.82	99.93	99.04	97.62	98.20	97.89	98.49	99.36
Mg as $MgCO_3$	1.00	1.07	1.08	1.07	1.02	0.65	1.07	1.05
$CaCO_3$+$MgCO_3$ as CO_2	44.41	44.49	44.10	43.48	43.70	43.38	43.86	44.23
L.O.I. / CO_2 Balance	0.98	0.98	0.99	1.01	1.01	1.02	1.00	0.99

Notes:
1. This analysis represents specifically the sample submitted.
2. Sample results reported on an dry 105°C weight basis.
3. Oxide analysis by X-ray fluorescence spectrometry. Samples fused at 1000°C with $Li_2B_4O_7/LiBO_2$.
4. Elemental sulfur and sulfide sulfur may be lost during high temperature fusion.
5. This report may not be reproduced except in its entirety.

Main Office 5400 Old Orchard Road Skokie, Illinois 60077-1030 Phone 847-965-7500 Fax 847-965-6541
Northeast Office 5565 Sterrett Place, Suite 312 Columbia, Maryland 21044-2685 Phone 410-997-0400 Fax 410-997-848(

ATTACHMENT D

CORRESPONDENCE WITH FDEP REGARDING THE USE

OF LIME RESIDUALS AS AN ALTERNATIVE RAW MATERIAL

FLORIDA ROCK INDUSTRIES INC
CEMENT GROUP / 4000 N.W. CR 235 / P.O. Box 459 / Newberry, FL 32669 / (352) 472-4722

May 3, 2011

Mr. Christopher Kirts, P.E.,
District Air Program Administrator
Florida Department of Environmental Protection
7825 Baymeadows Way, Suite B200
Jacksonville, FL 32256-7590

RE: Request for determination regarding performance testing and quarry storage
Florida Rock Industries, Inc.—Thompson S. Baker Cement Plant
Facility ID 0010087, E.U.s 003, 004, 009, and 010

Dear Mr. Kirts:

I am writing to notify you of a change in feed materials planned for mid-July and to obtain a determination from you that performance testing under NESHAPS Subpart LLL will not be necessary. This change would be to store at the quarry and co-feed calcium-carbonate residual (5%) to the cement process along with our mined limestone (95%), through the quarry's crusher to the cement process. This calcium-carbonate residual is a moist, fine material that is produced at Gainesville Regional Utilities drinking-water facility when quicklime ($Ca(OH)_2$) is mixed with raw groundwater to reduce the carbon-dioxide and calcium-carbonate hardness ($Ca(HCO_3)_2$) of drinking water.

Carbon dioxide + Lime → Calcium carbonate + Water
$CO_2 + Ca(OH)_2 \rightarrow CaCO_3 + H2O$

Calcium bicarbonate + Lime → Calcium carbonate + Water
$Ca(HCO_3)_2 + Ca(OH)_2 \rightarrow 2CaCO_3 + Water$

No increases in feed rate, production rate, ESP-inlet temperature, nor other operational changes from the conditions of the most recent performance tests will occur as a result of this change.

40 CFR 63.1349, NESHAPS Subpart LLL, states the following:

> (c) *Changes in operations.* (1) If you plan to undertake a change in operations that may adversely affect compliance with an applicable standard, operating limit, or parametric monitoring value under this subpart, the source must conduct a performance test as specified in §63.1349(b)

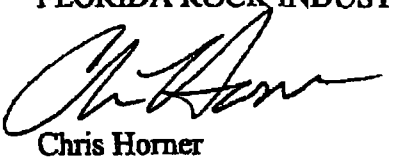
No difficulty complying with the Subpart LLL standards is expected based upon (1) EPA's published comments regarding Subpart LLL rules that indicate this feed change alone would not

increase Subpart LLL emissions, (2) evaluation of the expected effects of the feed change that indicate that Subpart LLL emissions will remain below the standards, and (3) low emissions demonstrated by three sets of D/F tests and three sets of PM emission tests conducted over the past 36 months. Therefore, I request that the feed change stated in the first paragraph of this letter be allowed without additional performance testing. Attachments A (EPA Rules and Comments), B (Expected Effects of Feed Changes on Emissions), and C (Previous Performance-Test Results) explain the bases for our expectations.

Please review this letter and contact me at (352) 472-4722, ext. 130, or Henry Gotsch, at ext. 121, if you have any questions or would like additional information. I look forward to hearing from you.

Sincerely,

FLORIDA ROCK INDUSTRIES, INC.



Chris Horner
Plant Manager

Florida Department of
Environmental Protection
Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

May 25, 2011

Mr. Chris Horner, Plant Manager
Florida Rock Industries, Inc.
4000 NW CR 235
Newberry, Florida 32669

Alachua County – Air Permit
Florida Rock Industries, Inc.
Thompson S. Baker Cement Plant
Facility ID Number: 0010087

Dear Mr. Horner:

On May 13, 2011 the Department received Florida Rock Industries, Inc., notification to include co-firing of calcium-carbonate residual (5%) with FRI's mined limestone (95%) as a feed material to EUs 003, 004, 009 and 010 and your request for an Air Permitting Determination regarding performance testing under 40 CFR 63, Subpart LLL. 40 CFR 63.1348(c)(1) & (2) of Subpart LLL state:

(c) *Changes in operations.* (1) If you plan to undertake a change in operations that may adversely affect compliance with an applicable standard, operating limit, or parametric monitoring value under this subpart, the source must conduct a performance test as specified in §63.1349(b).

(2) In preparation for and while conducting a performance test required in §63.1349(b), you may operate under the planned operational change conditions for a period not to exceed 360 hours, provided that the conditions in (c)(2)(i) through (c)(2)(iv) of this section are met. You must submit temperature and other monitoring data that are recorded during the pretest operations.

Florida Rock Industries, Inc., last compliance tests for PM and D/F were within compliance by a good margin. Based upon the information stated in the letter and the last compliance tests, it has been determined that this addition of calcium-carbonate residual as a feed material does not require immediate testing under 40 CFR 63.1348(c)(1) & (2) of Subpart LLL. However, please note the following:

1. The Department is requiring that calcium-carbonate residual feed materials be used when conducting the first scheduled D/F compliance test after making the change.

2. Please submit a month's worth of data for VOC/THC after the change in feed materials has occurred. If a substantial change in D/F levels is indicated, the Department may request a special compliance test for D/F in accordance with our rules.

If you have any questions, please contact Leslie Maybin at (904) 256-1567.

Sincerely,

Christopher L. Kirts. P.E
District Air Program Administrator

CLK: lm

Cc: Mr. Henry Gotsch - Florida Rock Industries, Inc.

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to Section 120.52(7), Florida statutes, with the designated agency Clerk, receipt of which is hereby acknowledged.

Monique Jordan

5/25/2011

(Clerk) (Date)

FLORIDA ROCK INDUSTRIES INC
CEMENT GROUP / 4000 N.W. CR 235 / P.O. Box 459 / Newberry, FL 32669 / (352) 472-4722

September 2, 2011

Mr. Christopher Kirts, P.E.,
District Air Program Administrator
Florida Department of Environmental Protection
7825 Baymeadows Way, Suite B200
Jacksonville, FL 32256-7590

RE: THC emissions associated with use of GRU's calcium-carbonate residual as feed material
Florida Rock Industries, Inc.—Thompson S. Baker Cement Plant
Facility ID 0010087, E.U.s 003, 004, 009, and 010

Dear Mr. Kirts:

In May, 2011, we requested a determination from you regarding special testing that might accompany the use of Gainesville Regional Utilities' calcium-carbonate residual as a minor feed material. Thank you for your response on May 25 that immediate testing for dioxin/furan and PM emissions under 40CFR63, Subpart LLL, would not be required.

We began receiving and incorporating the material into our feed at the beginning of June at a proportion of approximately 5% as we described in our request. As you instructed, I am sending you the THC-emissions data associated with the use of the material. You requested a month's worth of data for emissions that followed the start of the use of this material. I have attached daily averages from April until August to account for the periods when the kiln was shutdown over the summer and to show the emissions as they were prior to the change in feed material. THC emissions remained low even after starting use of the new feed material.

Please review these data and contact me at (352) 472-4722, ext. 121, if you have any questions or would like additional information. I look forward to hearing from you.

Sincerely,

FLORIDA ROCK INDUSTRIES, INC.

Henry Gotsch
Environmental Manager

Florida Rock Industries Inc.
Jacksonville, FL

1-day report for April, 2011
Base Interval: 1-day

Day	VOC Mass Rate lb/hr
1	3.54
2	3.67
3	3.80
4	5.53
5	5.18
6	3.39
7	3.90
8	4.37
9	4.36
10	4.11
11	3.76
12	5.11
13	4.83
14	4.01
15	4.13
16	4.77
17	4.61
18	4.46
19	5.79
20	5.13
21	4.44
22	4.11
23	3.79
24	0.02 D
25	0.05 D
26	0.06 D
27	0.07 D
28	0.07 D
29	0.07 D
30	0.06 D
Avg.	4.38

I - Invalid □U - User Data □D - Process Down □C - Calibration
M - Maintenance □E - Error □O - Out-of-Control □X - Excess Emission
W - Caution □N - Not Calibrated □F - Frozen FIFO □
□ □ □

Florida Rock Industries Inc.
Jacksonville, FL

1-day report for May, 2011
Base Interval: 1-day

Day	VOC Mass Rate lb/hr
1	0.06 D
2	0.07 D
3	0.07 D
4	0.07 D
5	0.09 D
6	0.07 D
7	0.06 D
8	1.64
9	2.86
10	0.59
11	3.78
12	4.55
13	4.13
14	4.42
15	4.31
16	3.42
17	4.22
18	2.45
19	3.73
20	4.19
21	4.35
22	5.45
23	4.60
24	2.42
25	4.59
26	5.71
27	4.06
28	4.63
29	4.51
30	1.89
31	0.07 D
Avg.	3.76

I - Invalid □U - User Data □D - Process Down □C - Calibration
M - Maintenance □E - Error □O - Out-of-Control □X - Excess Emission
W - Caution □N - Not Calibrated □F - Frozen FIFO □
□ □ □

Florida Rock Industries Inc.
Jacksonville, FL

1-day report for June, 2011
Base Interval: 1-day

Day	VOC Mass Rate lb/hr
1	0.02 D
2	0.03 D
3	0.03 D
4	0.05 D
5	0.68
6	2.94
7	5.15
8	4.36
9	3.66
10	3.58
11	4.45
12	0.17
13	0.18 D
14	0.04 D
15	0.06 D
16	0.05 D
17	0.04 D
18	0.05 D
19	0.05 D
20	0.03 D
21	0.24 D
22	0.27 D
23	0.35 D
24	0.03 D
25	0.03 D
26	0.02 D
27	0.04 D
28	0.03 D
29	0.03 D
30	0.13 D
Avg.	3.13

I - Invalid □U - User Data □D - Process Down □C - Calibration
M - Maintenance □E - Error □O - Out-of-Control □X - Excess Emission
W - Caution □N - Not Calibrated □F - Frozen FIFO □
□ □ □

Florida Rock Industries Inc.
Jacksonville, FL

1-day report for July, 2011
Base Interval: 1-day

Day	VOC Mass Rate lb/hr
1	0.02 D
2	0.03 D
3	0.02 D
4	0.02 D
5	0.02 D
6	0.02 D
7	0.02 D
8	0.02 D
9	0.01 D
10	0.01 D
11	0.01 D
12	0.00 D
13	0.02 D
14	0.04 D
15	0.05 D
16	0.03 D
17	0.03 D
18	0.02 D
19	0.02 D
20	0.02 D
21	0.01 D
22	0.01 D
23	0.01 D
24	0.00 D
25	0.01 D
26	0.00 D
27	0.02 D
28	0.02 D
29	0.13 D
30	0.01 D
31	0.34 D
Avg.	

I - Invalid □U - User Data □D - Process Down □C - Calibration
M - Maintenance □E - Error □O - Out-of-Control □X - Excess Emission
W - Caution □N - Not Calibrated □F - Frozen FIFO □
□ □ □

Florida Rock Industries Inc.
Jacksonville, FL

1-day report for August, 2011
Base Interval: 1-day

Day	VOC Mass Rate lb/hr
1	1.98
2	12.88
3	4.13
4	5.86
5	4.31
6	3.46
7	4.01
8	2.61
9	5.83
10	7.24
11	2.89
12	1.46
13	3.49
14	4.88
15	4.68
16	5.72
17	4.53
18	4.36
19	4.48
20	4.89
21	3.23
22	6.07
23	6.51
24	5.85
25	-0.22 IE
26	6.30
27	5.58
28	5.19
29	3.60
30	6.59
31	5.86
Avg.	4.79

I - Invalid □U - User Data □D - Process Down □C - Calibration
M - Maintenance □E - Error □O - Out-of-Control □X - Excess Emission
W - Caution □N - Not Calibrated □F - Frozen FIFO □
□ □ □