TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Buckeye Florida Limited Partnership
Foley Mill
One Buckeye Drive
Perry, Florida 32056

Facility ID No. 1230001

PROJECT

Project No. 1230001-033-AC
Request to test burn BFO-1 biofuel supplied by Clean Energy Pathways, Inc. in the No. 4 Lime Kiln

COUNTY

Taylor, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Air Resource Section
Northeast District Office
7825 Baymeadows Way, Suite B-200
Jacksonville, Florida 32256-7590

January 11, 2011

I. APPLICATION INFORMATION

A. APPLICANT NAME AND ADDRESS

Buckeye Florida Limited Partnership
Foley Mill
One Buckeye Drive
Perry, Florida 32056

Authorized Representative:
Mr. Howard Drew, Plant Manager

B. APPLICATION PROCESSING SCHEDULE

May 7, 2010	Received the application for an air pollution construction permit.
June 6, 2010	Request for Additional Information.
August 26, 2010	Additional Information Response received.
September 23, 2010	Request for Additional Information
December 15, 2010	Additional Information Response received Application deemed complete.

C. FACILITY LOCATION

The Buckeye Florida, Limited Partnership Foley Mill is located at One Buckeye Drive, Perry, Florida as shown in Figure 1.

Figure 1: Buckeye Florida Limited Partnership Foley Mill

D. FACILITY DESCRIPTION

Buckeye Florida, Limited Partnership Foley Mill operates an existing dissolving grade Kraft process pulp mill. In the Kraft process, the digesting liquor (white liquor) is a solution of sodium hydroxide and sodium sulfide that is mixed with wood chips and cooked under pressure. The spent liquor, known as weak black liquor, is concentrated and sodium sulfate is added to make up for chemical losses. The black liquor solids (BLS) are burned in the recovery furnaces to produce a smelt of sodium carbonate and sodium sulfide. The smelt is dissolved in water to form green liquor to which quicklime (calcium oxide) is added to convert the sodium carbonate back to sodium hydroxide, which reconstitutes the cooking liquor. The spent lime cake (calcium carbonate) is recalcined in a rotary lime kiln to produce quicklime, which is used to convert the green liquor to cooking liquor. Steam and energy needs at the plant are met by: combination boilers, which burn bark/wood, tall oil, supplemental residual oil; power boilers, which burn residual oil, tall oil, natural gas; and recovery boilers, which burn BLS, tall oil, and supplemental ultra low sulfur diesel and residual oil.

E. FACILITY CLASSIFICATION CODE (SIC)

Industry Group No.	26	Paper And Allied Products
Industry No.	2611	Pulp Mills

F. FACILITY REGULATORY CATEGORIES

- The facility is a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.
- This facility is a major source of air pollutants, other than HAPs.
- This facility has one or more emissions units subject to NSPS (40CFR 60).
- This facility has one or more emissions units subject to NESHAP (40 CFR 61 or Part 63)

G. Project Description

In the initial construction permit application received on May 7, 2010, the Foley Mill requested authorization to burn BFO-1 biofuel supplied by Parsons Energy Co. (now known as Clean Energy Pathways, Inc.) as an alternate fuel or a mixture of the BFO-1 Biofuel with any other authorized fuel in each of the fuel burning units at the mill (i.e., No. 1 Power Boiler, No. 2 Power Boiler, No. 1 Bark Boiler, No. 2 Bark Boiler, No. 2 Recovery Boiler, No. 3 Recovery Boiler, No. 4 Recovery Boiler, and No. 4 Lime Kiln).

In an Additional Information response received December 15, 2010, the mill clarified that its intent is to only replace No. 6 fuel oil with the BFO-1 biofuel in the same applications where No. 6 fuel oil is permitted to be used. In the bark boilers, the biofuel will only be used during startup, shutdown, malfunction, or temporary loss of bark. In the recovery boilers, the biofuel will only

be used during startup, shutdown, and as supplemental fuel (e.g. maintain the flame stability of the boiler).

The initial application stated that the Foley Mill would utilize the existing equipment at the mill to burn the BFO-1 biofuel. The mill would add the biofuel to the existing No. 6 fuel oil tank in a batch process. The No. 6 fuel oil tank may contain up to 100 percent of the biofuel. The mill would not require any physical changes to the existing emissions units in order to fire this biofuel.

According to information provided in the application, BFO-1 biofuel is formulated from 99.9 percent fatty free acid oil (processed soybean and/or fish oils) and 0.1percent by weight of petroleum diesel.

The applicant provided the specifications of the BFO-1 Biofuel along with typical No. 6 fuel oil, and No. 6 fuel oil fired at the fuel burning emissions units at the mill (August 25, 2010 response) which are summarized in Table 1 below.

Table 1: Summary of the characteristics of BFO-1 Biofuel by Parsons Energy Co. n/k/a Clean Energy Pathways, Inc.

			BFO-1[a]		**No. 6 Fuel Oil (typical)**
Test	**Test Method**	**Units**	**Minimum**	**Maximum**	
Flash Point	ASTM D93	°C	119	151	112.5- 202[c]
		°F	246	304	
Moisture	ASTM D95	%(v/v)	0.40	---	
	ASTM D6304	% Mass	---	0.57	
Kinematic Viscosity	ASTM D445	cSt	6.420 @ 40°C	29.735 @ 40°C	164.4 @ 50°Cc
Ash	ASTM D482	% Mass	0.1031	0.182	BDL- 0.6[e] 0.02- 0.03[c]
Pour Point	ASTM D97	°C	-6	9	0[c]
		°F	21	---	---
Heat of Combustion	ASTM D240	Btu/lb	16,700	17,800	
		Btu x 10^3 /gal	129.3	---	146
Specific Gravity	ASTM D4052	SG units	0.937	---	0.96[b]
Density	ASTM D4052	Lbs/gal	7.3	7.8	8[b]
Total Nitrogen	ASTM D4629	ppmw	296	---	1800-2800[b]
Total Halides/Halogens	EPA 9075	ppmw	<5.0	---	12[d]

			BFO-1[a]		No. 6 Fuel Oil (typical)
Test	**Test Method**	**Units**	**Minimum**	**Maximum**	
Total Chlorides		ppmw	---	---	BDL – 205[e]
Sulfur	ASTM D5453	% Mass	0.0046	---	0.0089-2.5[e]
	ASTM D4294		---	0.0183	0.841-1.48[c]
PCB's	EPA 8082	ppmw	<10	---	
Arsenic	EPA 6010	ppmw	<1.0	<1.72	BDL – 0.5 [e]
Cadmium		ppmw	<0.56	<1.0	BDL – 0.5 [e]
Chromium		ppmw	<0.88	<1.0	BDL – 0.8 [e]
Copper		ppmw	---		2.8[f]
Lead		ppmw	<1.0	<1.08	BDL – 5.0 [e]

[a] Source: Parsons Energy Company, LLC, BFO-1 Analysis Certificate and Gorge Analytical as submitted in Table 1 of the initial construction permit application received May 7, 2010.

[b] Source: Perry's Chemical Engineer's Handbook, 7th Edition as submitted in Table 2 of initial construction permit application received May 7, 2010.

[C] Source: Certificates of Analysis results of No. 6 fuel oil fired in fuel burning units at the mill from Canada Imperial Oil Limited (May 27, 2010) and Union Pacific Railroad (June 28, 2010) as submitted in the August 25, 2010 response.

[d] Source: External Combustion Sources for Electricity Generation. TRW, Inc. 1981, as submitted in Table 2 of initial construction permit application received May 7, 2010.

[e] Source: Boiler MACT historical data as submitted in Table 2 of initial construction permit application received May 7, 2010.

[f] Source: Emissions Assessment of Conventional Stationary Systems: Vol. III., as submitted in Table 2 of initial construction permit application received May 7, 2010.

H. Applicant's Expected Air Emissions

According to the initial construction permit application, the mill expects the emissions from combustion of the BFO-1 biofuel to be the same as for the combustion of No. 2 fuel oil or ultra-low sulfur diesel based on the analysis of the biofuel as presented in Table 1 above. The mill believes that there will not be an increase in potential emissions due to the firing of this biofuel since each affected emissions unit is currently authorized to fire fuels which result in higher potential emissions than this biofuel, i.e. No. 6 fuel oil, No. 2 fuel oil, wood, and black liquor solids in the case of the Recovery Boilers.

The applicant provided several tables, which are combined in Table 3 below, of estimated emissions when firing the proposed BFO-1 biofuel in each of the requested fuel burning emissions units at the mill. The mill assumed that the biofuel is similar to No. 2 fuel oil and used AP-42 emission factors for No. 2 fuel oil for the BFO-1 biofuel. As such, the potential emissions, as estimated by the applicant, are the same as No. 2 fuel oil and less than the potential emissions from currently authorized fuels.

In the additional information response received December 15, 2010, the mill provided a summary table of Particulate Matter and Visible Emissions compliance test results that were conducted in a drum-mix asphalt plant at APAC-Southeast, Inc. located in South Carolina while the kiln was burning the BFO-1 biofuel and also No. 5 fuel oil. (Table 2)

Table 2: Comparison of PM and Opacity Emissions with No. 5 Fuel Oil and Biofuel Oil in Drum-Mix Asphalt Plant at APAC-Southeast, Inc. – South Carolina Facility.

Parameters	Test Results			
	No. 5 Fuel Oil			Bio-Fuel Oil (7/1/2009)
	10/10/07	06/03/08	06/15/10	
Production (TPH)	140	220	197	200
Capacity (%)	58	90	NA	NA
Fuel Usage (gal/hr)	252	374	374	340
PM Emissions (lbs/hr)	5.21	0.28	0.16	0.23
Average Visible Emissions (%opacity)	0	0	0	0

The applicant states that Table 2 shows that PM emissions when burning biofuel are well with the range of the emissions when burning No. 5 fuel oil. PM emissions ranged from 0.16 to 5.21 pounds per hour and averaged 1.9 lb/hr while burning No. 5 fuel oil. PM emissions averaged 0.23 lb/hr when burning biofuel. The opacity was 0 percent when burning either fuel. These tests demonstrate that biofuels did not increase PM emissions or opacity compared to burning No. 5 fuel oil.

The applicant also states in the December 15, 2010 response that although test data is not available for other pollutants when burning biofuels, there is no reason to expect that biofuels would cause an increase in emissions from boilers or lime kilns compared to burning No. 6 fuel oil. Based on the characteristics of biofuel and No. 6 fuel oil, carbon monoxide and nitrogen oxides will not be affected by the burning of biofuel. Lower nitrogen oxides emissions are expected since the nitrogen content of the biofuel is 0.03 percent is lower than the typical nitrogen content of No. 6 fuel oil of 0.18 to 0.28 percent. Biofuel is a cleaner fuel than No. 6 fuel oil; therefore carbon monoxide emissions should be no greater than No. 6 fuel oil emissions.

In the additional information response received December 15, 2010, the Foley Mill revised its application to include a temporary authorization to test burn the biofuel in the No. 4 Lime Kiln.

The Foley Mill proposed the following Trial Burn program:

- Allow the test firing of the biodiesel fuel in the No. 4 Lime Kiln.
- Limit the test firing period to 30 days.
- The No. 4 Lime Kiln's fuel oil surge tank will be used to isolate the biofuel from the No. 6 fuel oil and control the burning of the fuels;
- The ability to fire 100-percent biofuel in the No. 4 Lime Kiln,

Table 3: Estimated Emissions at Foley Mill Emissions Units When Firing BFO-1 Biofuel[1]

Parameter	Units	No. 1 Power Boiler	No. 2 Power Boiler	No. 1 Bark Boiler	No. 2 Bark Boiler	No. 2 Recovery Boiler	No. 3 Recovery Boiler	No. 4 Recovery Boiler	No. 4 Lime Kiln
Annual Operating Hours	Hr/yr	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Maximum Heat Input Rate of EU	MMBtu/hr	249	249	300	601	625	527	803	210
Hourly Biofuel Usage Rate[2]	10^3 gal/hr	1.930	1.930	1.860	1.395	2.481	0.620	2.907	1.58
Annual Biofuel Usage Rate[3]	10^3 gal/yr	16,909	16,909	16,298	12,223	1,143	1,143	2,440	13,853
Emissions[4]									
PM	Lb/hr	3.86	3.86	24.00	18.00	0.50	0.12	0.58	[6]
	TPY	**16.91**	**16.91**	**105.12**	**78.84**	**0.11**	**0.11**	**0.24**	[6]
Worse-case[5]	TPY	195.68	195.68	207.61	467.48	202.93	197.1	285.33	[6]
PM_{10}	Lb/hr	1.93	1.93	12.00	9.00	0.25	0.062	0.29	[6]
	TPY	**8.45**	**8.45**	**52.56**	**39.42**	**0.57**	**0.057**	**0.12**	[6]
Worse-case[5]	TPY	168.28	168.28	204.47	460.40	155.85	151.35	203.44	
$PM_{2.5}$	Lb/hr	0.46	0.46	2.88	2.16	0.06	0.015	0.070	[6]
	TPY	**2.03**	**2.03**	**12.61**	**9.46**	**0.014**	**0.014**	**0.029**	[6]
Worse-case[5]	TPY	109.58		204.47	460.40	108.37	105.24	145.52	
SO_2	Lb/hr	137.05	137.05	132.09	99.07	176.12	44.03	206.40	[6]
	TPY	**600.26**	**600.26**	**578.57**	**433.93**	**40.58**	**40.58**	**88.62**	[6]
Worse-case[5]	TPY	2,932.0	2,932.0	2,826.0	2,119.5	673.62	597.14	484.71	
NO_x	Lb/hr	46.33	46.33	44.65	33.49	59.53	14.88	69.77	[6]
	TPY	**202.91**	**202.91**	**195.57**	**146.68**	**13.72**	**13.72**	**29.28**	[6]
Worse-case[5]	TPY	351.09	351.09	338.40	579.12	250.02	213.62	470.61	
CO	Lb/hr	9.65	9.65	9.30	6.98	12.40	3.10	14.53	[6]
	TPY	**42.27**	**42.27**	**40.74**	**30.56**	**2.86**	**2.86**	**6.10**	[6]
Worse-case[5]	TPY	91.61	91.61	788.40	1,579.43	258.63	218.22	354.62	
VOC	Lb/hr	0.39	0.39	0.37	0.28	0.50	0.12	0.58	[6]
	TPY	**1.69**	**1.69**	**1.63**	**1.22**	**0.11**	**0.11**	**0.24**	[6]
Worse-case[5]	TPY	6.00	6.00	44.68	89.50	44.89	37.87	26.38	

Parameter	Units	No. 1 Power Boiler	No. 2 Power Boiler	No. 1 Bark Boiler	No. 2 Bark Boiler	No. 2 Recovery Boiler	No. 3 Recovery Boiler	No. 4 Recovery Boiler	No. 4 Lime Kiln
Total HAPs	Lb/hr	0.09	0.09	0.088	0.066	0.12	0.029	0.14	0.075
	TPY	**0.40**	**0.40**	**0.39**	**0.29**	**0.027**	**0.027**	**0.058**	0.33

[1] From Additional information response received August 25, 2010
[2] Based on No. 6 Fuel Oil firing rate, maximum heat input rate of No. 6 fuel oil divided by 129 MMBtu/10^3 gallon heat content of biofuel.
[3] Based on hourly fuel usage rate multiplied by the annual operating hours.
[4] Biofuel emission factors assumed to be the same as No. 2 Fuel Oil and are based on AP-42, Section 1.3, September 1998.
[5] Worse-case emissions is the highest maximum emission rate due to fuel combustion from a previously authorized fuel, i.e. natural gas, No. 6 fuel oil, wood, black liquor solids as appropriate for a given emissions unit.
[6] Emission factors presented in application are based on lime production and do not appear to be dependent upon type of fuel fired.

- To limit the use of biodiesel during the duration of the project to 1,138,600 gallons. This is equivalent to the maximum capacity of the No. 4 Lime Kiln (204 MMBtu/hr), 24 hours/day & 30 days total operation, 129 MMBTU (HHV) of biofuel.
- Emissions testing for PM, CO, NOx, and opacity to be conducted during the 30-day period using EPA approved test methods, 15-day notice to the Department, test results submitted with 45-days of testing. Testing shall be conducted while the No. 4 Lime Kiln is operating at permitted capacity.
- Fuel analysis of the biofuel, including proximate/ultimate analysis, Heating Value, sulfur nitrogen, and chlorine content.
- Allow for a temporary storage tank to be brought on-site for the biodiesel for the 30-day period;
- The option to allow the mill to continue the trail test burns on the remaining emissions units sometime in the future. Specifically, the No. 1 or No. 2 Power Boiler[1] (to be determined by the mill in the future), the No. 1 Bark Boiler, and the No. 4 Recovery Boiler.
- The mill shall submit a test protocol for each of the additional emissions units at least 30 days prior to conducting the trial burn on the given emissions unit.
- The mill will bring on-site a temporary tank for the biofuel for the test burn period.

[1] *Although the mill states that it will determine in the future whether a test burn will occur in the No. 1 or No. 2 Power Boiler, the No. 2 Power Boiler is restricted to firing natural gas only in accordance with Construction Permit No. 1230001-023-AC. As stated in the Technical Evaluation and Preliminary Determination for Permit No. 1230001-023-AC, the restriction was taken to avoid PSD Review.*

II. APPLICATION REVIEW

A. Potential Air Emissions Discussion

The ash content of BFO-1 as shown in Table 1 above (0.1031 – 0.182 percent by weight) appears to be greater than the ash content in the No. 6 fuel oil being accepted and fired in the fuel burning units at the mill (0.02-0.03 percent by weight). However, according to the application, the ash content specification of the mill's No. 6 fuel oil is 0.22 percent by weight. The actual PM emissions should be verified by the mill conducting an emissions test while firing the BFO-1 biofuel.

The sulfur content of the BFO-1, as submitted by the applicant and shown in Table 1, is in the range of 0.0046- 0.01183 percent by weight. Sulfur dioxide emissions are generated from the oxidation of the sulfur contained in the fuel. As such, the actual sulfur dioxide emissions are expected to decrease when firing the BFO-1 in the fuel burning units when compared to both No. 2 fuel oil (0.5 percent by weight) and No. 6 fuel oil (<2.5 percent by weight). The sulfur content of the BFO-1 biofuel as shipped to the mill should be verified during any emissions testing that is conducted as a part of this project.

According to the supplied information in Table 1, the fuel bound nitrogen content of BFO-1 is 256 ppmw. This nitrogen content is lower than the nitrogen content of typical No. 6 fuel oil (1800-2800 ppmw). This may result in lower nitrogen oxides emissions formed in the combustion process due to fuel NOx. However, nitrogen oxides may also be formed in the combustion

process through thermal NOx. Thermal NOx is produced from a series of chemical reactions in which the diatomic nitrogen and oxygen present in the combustion air dissociate in the high temperature combustion zone and react to form NOx. Fuel NOx is formed when chemically bound nitrogen in the fuel is oxidized.

AP-42 states that because of the negligible nitrogen content in distillate oils, thermal NOx is the dominant NOx-forming mechanism in units firing distillate oils. However, for units firing residual oils, fuel NOx is the dominant NOx-forming mechanism.

The Environmental Protection Agency (EPA) conducted emissions tests on reciprocating diesel engines firing biodiesel in varying percentages, including 100 percent biofuel diesel versus No. 2 fuel oil.[1] The results were greater NOx emissions, but lower PM, CO, and VOC emissions when firing biodiesel than when firing No. 2 fuel oil.

The Department is aware of biodiesel test firing in combustion turbines where NOx emissions were reduced when using 99.9 percent biodiesel, as well as increases in NO_x emissions when a lower, 25 percent blend of biodiesel was used in the testing. [2,3]

The Department obtained a copy of the results of a NO_x and CO emissions test conducted at the same drum-mix asphalt plant at the APAC-Southeast, Inc. facility located in Hardeeville, South Carolina as the PM and Opacity test results provided by the applicant (Table 3 above). The tests were conducted on July 1, 2009 by Air Compliance Testing, Inc., Cleveland, Ohio using EPA Method 7E and 10 respectively, while the dryer fired the BFO-1 biofuel.

Table 4: APAC-Southeast, Inc. Hardeeville, SC facility 7/1/09 NO_x and CO emissions

Parameters	**Bio-Fuel Oil (7/1/2009)**
Production (TPH)	200
Capacity (%)	NA
Fuel Usage (gal/hr)	340
Nitrogen Oxides Concentration (ppmvd)	33.7
Stack Gas Average Flow Rate (dscfm)	18,611
NO_x Emissions (lbs/hr)	4.48
NOx Emissions (lbs/gallon biofuel)	0.013
CO Concentration (ppmvd)	492.3
CO Emissions (lbs/hr)	40.1

The Department has also issued air construction permits to several APAC-Southeast, Inc. facilities located throughout Florida authorizing the firing of the BFO-1 biofuel as an alternative fuel in their drum-mix asphalt kilns. The applications for many of these permits[4] estimated the potential air emissions when firing this fuel on the results of a NOx, CO, VOC, and PM emissions testing conducted at the APAC-Southeast, Inc. asphalt facility located in Kissimmee, Florida. The NOx, CO, VOC tests were conducted on August 20, 2009 by Ambient Air Services, Inc., Starke, Florida and the PM test was performed by Bottorf Associates, Inc. 6729 Edgewater Commerce Parkway, Orlando, Florida while the dryer fired the BFO-1 biofuel. A summary of these emission test results are in the Table 5 below:

Table 5: APAC-Southeast, Inc. Kissimmee, FL facility 8/20/09 NOx, CO and VOC emissions

Parameters	Bio-Fuel Oil (8/20/2009)
Production (TPH)	350
Capacity (%)	NA
Fuel Usage (gal/hr)	778
Nitrogen Oxides Concentration (ppmvd)	100.6
Stack Gas Average Flow Rate (dscfm)	34,247
NOx Emissions (lbs/hr)	24.7[1]
NOx Emissions (lbs/gallon biofuel)	0.032
CO Concentration (ppmvd)	317
Stack Gas Average Flow rate (dscfm)	34,247
CO Emissions (lbs/hr)	47.4
VOC Concentration (ppmvd)	10.7
Stack Gas Average Flow rate (scfm- wet)	47,060
VOC Emissions (lbs/hr as propane)	3.4
PM Emissions (gr/dscf)	0.014[2]

[1] The test report noted that on 23 minutes of data is valid for Run 1 of the test due to the NO_x produced being above the range of the instrument used for analysis. The average included only the 23 minutes of Run 1.

[2] From Department Air Resource Management System database.

When compared with the estimated NO_x and CO emissions for a waste-oil fired dryer at a drum-mix hot asphalt plant using AP-42 emission factors in Table 11.1-7, an increase in both NO_x and CO emissions may have occurred at Kissimmee, Florida while firing this biofuel based on the August 20, 2009 testing. The test from the Hardeeville, South Carolina facility indicates that a reduction in NO_x emissions and an increase in CO emissions may have occurred while burning the BFO-1 biofuel.

The estimated NO_x and CO emissions using AP-42 emission factors appear in the Table below:

Pollutant	Emission Factor (lbs/ton)	Lbs/hr @ 200 TPH	Lbs/hr @ 350 TPH
NO_x	0.055	11.0	19.25
CO	0.13	26.0	45.5
VOC	0.032	---	11.2

Several of these air construction permits that have been issued to hot mix asphalt plants within the State of Florida require NOx, CO, PM, and Opacity emissions testing prior to the applicant applying for and obtaining an operation permit authorizing the addition of this biofuel.

The APAC-Southeast, Inc. asphalt facility located in Kissimmee, Florida, conducted a NOx emission test on March 18, 2010 while the dryer fired the BFO-1 biofuel. The test was conducted by Air Compliance Testing, Inc., Cleveland, Ohio using EPA Test Method 7E. A summary of these emission test results are in the Table 6 below:

Table 6: APAC-Southeast, Inc. Kissimmee, FL facility 3/18/10 NOx emissions

Parameters	**Bio-Fuel Oil (3/18/2010)**
Production (TPH)	337
Capacity (%)	NA
Fuel Usage (gal/hr)	771
Nitrogen Oxides Concentration (ppmvd)	110.4
Stack Gas Average Flow Rate (dscfm)	21,210
NOx Emissions (lbs/hr)	16.78
NOx Emissions (lbs/gallon biofuel)	0.022

When compared with the estimated NO_x and CO emissions for a waste-oil fired dryer at a drum-mix hot asphalt plant using AP-42 emission factors in Table 11.1-7, a decrease in NO_x emissions may have occurred at Kissimmee, Florida while firing this biofuel based on the March 18, 2010 testing.

It must also be noted that the heat content of the BFO-1 biofuel, as shown in Table 1, is less than No. 6 fuel oil. Therefore, the mill will have to fire more BFO-1 biofuel in order to equal the same power output that would be achieved with the firing of No. 6 fuel oil. This is addressed in the construction permit for the trial burn of the biofuel.

The applicant was not able to provide the Department emissions test data while the BFO-1 fuel was being fired in other external combustion sources like those being requested, i.e. boilers, or lime kilns. Because of the limited emissions test data, the Department finds the mill's approach of a test burn in the No. 4 Lime Kiln a method for the mill to obtain such emissions and operational data.

B. AIR POLLUTATION REGUATIONS

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control – General Provisions); 62-210 (Stationary Sources – General Requirements); 62-212 (Stationary Sources – Preconstruction Review); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources – Emissions Monitoring). Specifically, air construction permits are required pursuant to Rules 62-4, 62-210 and 62-212, F.A.C.

In addition, the U. S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations on a quarterly basis in Rule 62-204.800, F.A.C.

In accordance with 40 CFR 60.14, a modification is any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies except under the exemption conditions stated within the section. Upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere. The section states that the emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable.

The applicant has stated that they do not expect an increase in emissions due to the firing of the BFO-1 biofuel as a fuel since each affected emissions unit (No. 4 Lime Kiln, No. 1 Bark Boiler, No. 1 Power Boiler, No. 4 Recovery Boiler) uses fuels which result in higher emissions than those predicted for the biofuel (Table 3). The applicant shall also verify the emissions due to the firing of the BFO-1 biofuel in the No. 4 Lime Kiln in a trial burn authorized by this construction permit.

Pursuant to 40 CFR 60.15, a project is considered reconstruction when the fixed capital costs of the replacement components exceed 50% of the fixed capital costs for a comparable new replacement unit. The applicant has stated that the firing of the BFO-1 biofuel will require no physical changes to be made to the No. 4 Lime Kiln or any of the requested fuel burning units. The BFO-1 fuel will be stored in a temporary storage tank during the trial burn. The No. 4 Lime Kiln's fuel oil surge tank will be used to isolate the biofuel from the No. 6 fuel oil and control the burning of the fuels. Therefore, the project is not considered reconstruction for purposes of the NSPS.

Existing Permits and Regulations: The conditions of this permit supplements all other previously issued air construction and operation permits for this emissions unit. These conditions are in addition to all other applicable permit conditions and regulatory requirements. The Permittee shall continue to comply with the conditions of those permits, which include restrictions and standards regarding capacities, production, operation, fuels, emissions, monitoring, recordkeeping, reporting and the like.

It is not believed that the temporary use of BFO-1 as a fuel will trigger the applicability of any regulation not already being applied to the fuel burning emissions units at the mill, including promulgated New Source Performance Standards, National Emissions Standards for Hazardous Air Pollutants, and State air regulations.

C. PSD Applicability for Project

The Department regulates major stationary sources in accordance with Florida's PSD program, as defined in Rule 62-210.200, F.A.C. and approved by EPA in the State Implementation Plan (SIP). A PSD review is only required in areas that are currently in attainment with the NAAQS for a given pollutant or areas designated as "unclassifiable" for the pollutant. A facility is considered "major" with respect to PSD if the facility emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant, or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the 28 Major Facility Categories as defined in Section 62-210.200, F.A.C., or
- 5 tons per year of lead.

For new projects at existing PSD-major sources, each regulated pollutant is reviewed for PSD applicability based on emissions thresholds known as the Significant Emission Rates listed in 62-210.200 (Definitions, Significant Emission Rate), F.A.C. Projects that result in a significant net emissions increase are considered "major modifications." For each significant pollutant, the applicant must not only employ Best Available Control Technology (BACT) to minimize emissions but also conduct an appropriate ambient impact analyses. Although a facility may be "major" with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several significant regulated pollutants.

This facility is a "major source" with respect to the PSD regulations. However, this temporary field-test to fire BFO-1 biofuel is not a "major modification" to the existing major source. The test firing of the biofuel is a limited and a relatively short-term evaluation to determine: (1) emission changes of pollutants (NO_X, CO, PM/PM_{10}, and Opacity) that may result from firing the biofuel, (2) verify the biofuel specifications (sulfur content, nitrogen content, etc.) and (3) whether firing the biofuel over the duration of the project results in any operational problems. The current emission limits are not waived during the field tests, and neither emissions nor heat rates in excess of the current permit limits are allowed during the biofuel test firing.

Because no long-term, permanent modification, or increase in potential emissions are being authorized, the Department does not consider this field-test to be a "major modification" for purposes of the PSD regulations.

III. PRELIMINARY DETERMINATION

Based on the biofuel material properties provided by the applicant, the Department believes that the existing No. 4 Lime Kiln can be operated while burning BFO-1 within the operational and emission limitations of the existing air permits. However, the mill shall be required to demonstrate compliance with the applicable emission limitations and standards.

Additional details of this analysis may be obtained by contacting Rita Felton-Smith by phone at (904) 807-3237, by email at Rita.Felton-Smith@dep.state.fl.us , or by mail at the Department's Northeast District Office, 7825 Baymeadows Way, Suite B-200, Jacksonville, FL 32256-7590.

References

[1] United States Environmental Protection Agency Report, "A Comprehensive Analysis of Biodiesel Impacts on Exhaust emissions", Report No. EPA420-P-02-001, October 2002 as presented in Keys Energy Services, Stock Island Power Plant Technical Evaluation for DEP File No. 0870003-010-AC, September 29, 2008.

[2] Daratech, Inc., Press Release, "Biodiesel Test Expands GE Energy's Aeroderivative Gas Turbine Fuel Capability", September 21, 2007 as presented in Keys Energy Services, Stock Island Power Plant Technical Evaluation for DEP File No. 0870003-010-AC, September 29, 2008.

[3] Suez energy Generation NA, "Biodiesel Test on an Alstom GT 11N", August 15, 2006. www.resourcesaver.com/file/toolmanager/CustomO124C402F97595.pdf. as presented in Keys Energy Services, Stock Island Power Plant Technical Evaluation for DEP File No. 0870003-010-AC, September 29, 2008.

[4] Air Construction Permit Nos. 0090049-009-AC, 09700030-013-AC, 0210023-009-AC, 7770040-008-AC, 7770073-013-AC, 7770142-011-AC www.dep.state.fl.us/air/emission/apds/default.asp