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September 1, 2017

Mr. Corey Barnhill
Managing Partner
Southeastern Grain Company, LLC
201 North Front Street Suite 704
Wilmington, NC 28401

SUBJECT: Applicability Determination No. 2930: Non-Hazardous Secondary Material Determination
Southeastern Grain Company, LLC – Wilson Facility
Facility ID No.: 9800229
Wilson, Wilson County

Dear Mr. Barnhill:

The North Carolina Division of Air Quality (NC DAQ) received your initial letter dated August 31, 2016 and your supplemental letters dated March 7, 2017 and August 22, 2017 as well as additional emails summarizing your analysis of food grade packaging. Southeastern Grain Company, LLC (SGC) proposes to burn food grade packaging as a fuel in the existing rotary drum dryer at SGC's feed mill in Wilson. The rotary drum dryer currently fueled by natural gas will be modified to incorporate biomass consisting of wood shavings and food grade packaging normally consisting of 50% bun/bread packaging, 20% candy packaging, and 30% pet food bagging as represented in the composite samples. The rotary drum dryer is used to dry bakery by-products, such as breads, pastas, and cookies at a maximum capacity of 30 tons per hour while producing a high value feed ingredient for animal consumption. The dryer is heated by a furnace rated at 40 million Btu per hour.

Food grade packaging is a non-hazardous secondary material (NHSM) within the meaning of Title 40, Part 241 of the Code of Federal Regulations (40 CFR Part 241). The food grade packaging described in the letters referenced above is within control of the generator as required by 40 CFR 241.3(b)(1) and meets the legitimacy criteria provided in 40 CFR 241.3(d)(1). Therefore, NC DAQ has determined that the food grade packaging is not a solid waste when used as fuel in a combustion unit. This determination relies on the language of the current Federal regulations defining the NHSM rule.

Within Control of the Generator – 40 CFR 241.3(b)(1)

Pursuant to 40 CFR 241.3(b)(1), SGC must demonstrate that the food grade packaging meets the "within control of the generator" definition. "Within control of the generator" means that the non-hazardous secondary material is generated and burned in combustion units at the generating facility; or that such material is generated and burned in combustion units at different facilities, provided the facility combusting the non-hazardous secondary material is controlled by the generator; or both the generating facility and the facility combusting the non-hazardous secondary material are under the control of the same person as defined in 40 CFR 241.2.

SGC receives bakery food products commonly referred to as bakery byproducts from bakeries or the like for producing a feed ingredient designated for animal consumption and secondarily food grade packaging to be utilized as a supplemental fuel. SGC separates the food grade packaging from the bakery byproduct by shredding and drying and then consolidating into a designated storage area for use as a supplemental fuel for the dryer. SGC controls the food grade packaging from its origination through combustion, and thus meets the within control of the generator definition under 40 CFR 241.2.

Therefore, NC DAQ has determined that SGC maintains the food grade packaging within control of the generator described above meeting the regulatory definition of "within control of generator" with further support from the recent EPA approval[1] of categorical NHSM fuels (i.e. paper recycling residuals).

Managed as a Valuable Commodity – 40 CFR 241.3(d)(1)(i)

SGC receives the bakery byproduct from the food product manufacturer and then processes by removing any packaging, blending the various types together, passing the mixture through a rotary dryer to reduce moisture, and ultimately consolidating into feed ingredient and the food packaging, respectively. SGC proposes to measure the variable weight of food packaging with a batch scale in-line with the packaging collection system. A batch of packaging will be collected and weighed before it's released into a separate surge bin that feeds the rotary dryer via a controllable auger system. The batch weighing will allow management and recordkeeping of the tonnage produced on a daily basis while the feed system will help regulate the hourly combustion. The food packaging will be stored onsite in a designated area for use as a supplemental fuel for the rotary dryer. The NC DAQ concludes that these management practices satisfy the requirement that the NHSM be managed as a valuable commodity, and if so managed, the food grade packaging meets the legitimacy criterion pursuant to 40 CFR 241.3(d)(1)(i).

Meaningful Heating Value – 40 CFR 241.3(d)(1)(ii)

In the preamble to the final NHSM definitional rule, US EPA indicated that materials with a heat content of at least 5,000 British thermal units per pound (Btu/lb) presumptively satisfy this criterion.[2]

SGC analyzed composite samples of food grade packaging collected. Because SGC intends to dry the material prior to burning it as a fuel it is appropriate to look at the higher heating value (HHV) of the material. The average HHV of the sampled material 8,776 Btu/lb as received. As a basis of comparison, the heat content of green wood chips on a wet basis is 4,000 Btu/lb while 7,400 Btu/lb for dry wood chips.

Because the food grade packaging has an average heat content above 5,000 Btu/lb (approximately 8,776 Btu/lb), the NC DAQ has determined that the food grade packaging has meaningful heating value and meets the legitimacy criterion under 40 CFR 241.3(d)(1)(ii).

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[1] https://www.gpo.gov/fdsys/pkg/CFR-2016-title40-vol27/xml/CFR-2016-title40-vol27-sec241-3.xml

[2] 78 Fed. Reg. 9172 (February 7, 2013).

Comparable Contaminant Concentrations – 40 CFR 241.3(d)(1)(iii)

In order for a NHSM to be classified as a non-solid waste fuel, it must "contain contaminants or groups of contaminants *at levels comparable in concentration to or lower than* those in traditional fuels which the combustion unit is designed to burn."[3]

Contaminants

Contaminants are defined as "all pollutants identified in the Clean Air Act sections 112(b) or 129(a)(4) *including the elements chlorine, fluorine, nitrogen, and sulfur in cases where non-hazardous secondary material are burned as fuel and combustion will result in the formation of hydrogen chloride, hydrogen fluoride, and nitrogen oxides or sulfur dioxide*."[4] In addition to a specific list of pollutants and precursors that fall within the definition of "contaminants," the listing also excludes pollutants that are unlikely to be found in non-hazardous secondary materials as well as individual cresol and xylene isomers.[5]

The NC DAQ reviewed the concentrations of the following contaminants in the food grade packaging:

- **Metals:** Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Manganese, Mercury, Nickel, and Selenium
- **Halogens:** Chlorine, Fluorine
- **Additional Precursors:** Nitrogen, Sulfur
- **HAP compounds:** Formaldehyde

Designed, not Permitted to Burn

SGC is proposing to burn the food grade packaging in the existing rotary dryer. SGC has indicated that the existing rotary drum dryer is designed to burn solid fuels, including wood. In accordance with US EPA's interpretation of "designed to burn," the NC DAQ compared the concentrations of contaminants in the food grade packaging again to the contaminant levels in wood and biomass materials as provided in the November 29, 2011 guidance document.

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[3] 40 CFR 241.3(d)(1)(iii) (February 8, 2016) (*emphasis added*). Note effective March 9, 2016; however, this rule revision does not affect the outcome of this determination.

[4] 40 CFR 241.2 (February 8, 2016) (*emphasis added*).

[5] The definition is as follows: "*Contaminants* means all pollutants listed in Clean Air Act sections 112(b) and 129(a)(4), with the following three modifications. This definition includes the elements chlorine, fluorine, nitrogen, and sulfur in cases where non-hazardous secondary materials are burned as a fuel and combustion will result in the formation of hydrogen chloride (HCl), hydrogen fluoride (HF), nitrogen oxides (NO_x), or sulfur dioxide (SO_2). The definition does not include the following pollutants that are either unlikely to be found in non-hazardous secondary materials and products made from such materials or are adequately measured by other parts of this definition: hydrogen chloride (HCl), chlorine gas (Cl_2), hydrogen fluoride (HF), nitrogen oxides (NO_x), sulfur dioxide (SO_2), fine mineral fibers, particulate matter, coke oven emissions, diazomethane, white phosphorus, and titanium tetrachloride. The definition does not include m-cresol, o-cresol, p-cresol, m-xylene, o-xylene, and p-xylene as individual contaminants distinct from the grouped pollutants total cresols and total xylenes." See 78 Fed. Reg. 9212 (Feb. 7, 2013).

Results of the Contaminant Comparison

SGC had ALS Environmental analyze the contaminant levels in composite samples of food grade packaging. A summary of the measured contaminant levels and the contaminant levels in biomass materials is provided as attachment to this letter. All contaminants show that the measured contaminant levels in the food grade packaging are within the range of contaminant concentrations in the traditional fuel (biomass) that the existing rotary drum dryer can burn while using maximum and average values (see attached table).

Given the comparability of all relevant contaminants between biomass and food grade packaging as characterized by your submittal, the NC DAQ has determined that the food grade packaging does meet the legitimacy criteria under 40 CFR 241.3(d)(1)(iii).

Conclusion

As described in your initial letter dated August 31, 2016 and your supplemental letters dated March 7, 2017 and August 22, 2017 as well as additional emails summarizing your analysis of food grade packaging, the food grade packaging does remain within the control of the generator pursuant to 40 CFR 241.3(b)(1) and does meet the legitimacy criteria provided in 40 CFR 241.3(d)(1). Therefore, the NC DAQ has determined that food grade packaging is not a solid waste when used as fuel in a combustion unit. As a result of this determination, the existing rotary drum dryer would not be subject to the combustion source emission standards for biomass fuel promulgated pursuant to Section 129 of the Clean Air Act. If you have any questions regarding this NHSM determination, please contact Mr. Jeff Twisdale at (919) 707-8472 or Jeff.Twisdale@ncdenr.gov.

Sincerely,

for Beverly R. Bullock

William D. Willets, P.E., Chief, Permitting Section
Division of Air Quality, NC DEQ

Attachment

c: Raleigh Regional Office
Central Files

ATTACHMENT

TABLE 1: CONTAMINANT COMPARISON OF FOOD GRADE PACKAGING to WOOD & BIOMASS MATERIALS

		Contaminant Concentrations in Wood & Biomass Materials [1]				Wilson Bakery Packaging Analytical Results			
		Literature Sources	QAQPS Databases [2]						
Contaminant	Units	Range[4]	Range	Average[3]	ND value[5]	10/25/2015	11/25/16 (#1)	11/25/16 (#2)	Average[5,6]
Metal Elements - dry basis									
Antimony (Sb)	ppm	ND - 26	ND - 6.0	0.9	0.196	ND	ND	ND	0.20
Arsenic (As)	ppm	ND - 6.8	ND - 298	6.3	0.196	ND	1.96	ND	0.78
Beryllium (Be)	ppm	--	ND - 10	0.3	0.078	0.69	ND	ND	0.28
Cadmium (Cd)	ppm	ND - 3	ND - 17	0.6	0.098	ND	ND	ND	0.10
Chromium (Cr)	ppm	ND - 130	ND - 340	5.9	0.196	7.8	18.3	4.4	10.17
Cobolt (Co)	ppm	ND -24	ND - 213	6.5	0.196	ND	ND	ND	0.20
Lead (Pb)	ppm	ND - 340	ND - 229	4.5	0.196	ND	ND	ND	0.20
Manganese (Mn)	ppm	7.9 - 840	ND - 15800	302	0.196	37.8	19.2	33.6	19.00
Mercury (Hg)	ppm	ND - 0.2	ND - 1.1	0.03	0.196	0.009	0.015	0.008	0.01
Nickel (Ni)	ppm	ND - 540	ND - 175	2.8	0.196	B.1	1.18	1.1	3.46
Selenium (Se)	ppm	ND - 2	ND - 9.0	1.1	0.196	ND	ND	ND	0.20
Non-Metal Elements - dry basis									
Chlorine (Cl)	ppm	ND - 2600	ND - 5400	259		1326	1682	123	1043.67
Fluorine (F)	ppm	ND - 300	ND - 128	32.4	varies[6]	<100	<50	2.04	10.68
Nitrogen (N)	ppm	200 - 39500	2200 - 4600	3460		3500	1.21	0.23	1167.15
Sulfur (S)	ppm	ND - 8700	ND - 6100	704	0	1600	0.22	ND	800.11
Hazardous Air Pollutant (HAP)									
Formaldehyde	ppm	1.6 - 27[7]	-	-	0.4	ND	ND	ND	0.40
Other									
Heating Value (as received BTU/lb)	BTU/lb					8,455	7657	10217	8776.33

(1) The wood and biomass materials includes data for untreated wood and biomass, including bark, bagasse, hog fuel, and agricultural plant residues.

(2) USEPA, Office of Air Quality Planning and Standards (2011a & 2011b).

(3) Averages are weighted averages of individual facilities responding to the QAQPS survey. Averages only include samples above detection limits.

(4) Energy Research Center for the Netherlands, Phyllis Biomass database.
Http://www.ecn.nl/phyllis

(5) ND values are assumed to be the Practical Quantitation Limit (PQL) divided by 5 to approximate the Maximum Detection Limit (MDL).

(6) Less than values are divided by 5 and incorporated into the average.

(7) T. Hunt (2011)