

North Carolina Department of Environmental Quality

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Governor

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Secretary

October 15, 2015

Mr. Steven Ingle
Vice President of Engineering
North Carolina Renewable Power, LLC
4599 East Lake Boulevard
Birmingham, AL 35217

SUBJECT: Applicability Determination Nos. 2671 and 2672 – Secondary Material Determinations
North Carolina Renewable Power - Lumberton, LLC and
North Carolina Renewable Power - Elizabethtown, LLC
Facility ID Nos. 7800166 and 0900043
Lumberton, Robeson County and Elizabethtown, Bladen County

Dear Mr. Ingle:

The North Carolina Division of Air Quality (NC DAQ) received your letter dated July 20, 2015 summarizing your analysis of creosote treated wood (CTW) including creosote treated railroad ties and utility poles. North Carolina Renewable Power - Lumberton, LLC (NCRP-L) and North Carolina Renewable Power - Elizabethtown, LLC (NCRP-E) are proposing to burn CTW as a fuel in the four existing non-CISWI wood-fired combustion units (boilers) rated at 180 million Btu per hour each (two boilers at each facility). Air emissions from these sources are each controlled by their respective multicyclones, bagfilters, sorbent injection systems and selective non-catalytic reduction (SNCR) systems. The boilers are used to generate steam that operates the associated turbine/generator to produce electricity for sale to the local utility. The boilers were designed to burn multiple fuels, including wood, coal, fuel oil, tired-derived fuel, pelletized paper fuel and flyash briquettes.

Creosote treated wood 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 creosote treated wood described in the letter referenced above is processed and meets the legitimacy criteria provided in 40 CFR 241.3(d)(1). Therefore the NC DAQ has determined that this material is not a solid waste when used as fuel in a combustion unit. This determination relies on the language of the current Federal rule defining NHSM, discussions NC DAQ has had with representatives of the EPA, and on the proposed changes to the NHSM rule.

Processing of Discarded NHSM – 40 CFR 241.3(b)(4)

Pursuant to 40 CFR 241.2, “processing” means any operations that transform discarded NHSM into a non-waste fuel. “Processing” includes, but is not limited to, operations necessary to: remove or destroy contaminants; significantly improve fuel characteristics of the material, *e.g.* sizing or drying the material in combination with other operations; or chemically improve the as-fired energy content. Minimal operations that result only in modifying the size of the material by shredding do not constitute processing for purposes of this definition. “Secondary material” means any material that is not the primary product of a manufacturing or commercial process, and can include post-consumer material, off-specification commercial chemical products or manufacturing chemical intermediates, post-industrial material, and scrap.

The creosote treated wood that NCRP proposes to burn is collected directly from the railroad and utility companies by National Salvage & Service Corporation (National Salvage) or a similar vendor for processing before delivery to NCRP. The CTW is currently collected, separated and processed into a uniform chipped product by National Salvage and then will be directly transferred to NCRP for storage, blending and combustion. These materials will be blended with biomass-based fuels at approximately 25% CTW to 75% non-CISWI wood and/or poultry litter (recently permitted). NCRP proposes that National Salvage will significantly improve the fuel combustion properties of the CTW in order to produce an engineered fuel prior to use in the boilers. National Salvage and NCRP will improve the fuel characteristics of the material through visual inspection, sampling/testing, screening (removal of foreign materials), sizing, grinding, blending with non-CISWI wood, and drying and aging of wood. The CTW will be sampled and tested regularly for moisture content, ash content and approximate heat value. Quality assurance testing on representative samples on a batch basis will ensure that contaminant levels are comparable to or less than those found in traditional fuels which the boilers are designed to burn. Large physical materials will be removed manually and by mechanical screening. Ferrous metal substances will be removed by passing the material through a magnetic separation system. NCRP will conduct secondary screening on site for metals encountered if necessary. Then the CTW will be stored in an appropriate storage area until it is blended with the primary non-CISWI wood storage pile as soon as possible but normally within 10 days of arrival with the existing biomass to ensure adequate consistency in moisture and energy content, and limit emissions from combustion.

NC DAQ has determined that the processing steps described above meet the regulatory definition of “processing” in 40 CFR 241.2 with further support from a recent EPA determination of proposed NHSM fuels.¹

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

Normally within 24 hours of processing by National Salvage or a similar vendor, the material will be transported by truck for delivery to the NCRP facility. Each truck will be weighed to confirm delivery quantity. NCRP will store the CTW in a covered concrete lined pad prior to using it as a fuel to prevent moisture uptake in the material. Use of the concrete lined pad, particularly to limit moisture intake, is consistent with typical management of wood chips and other biomass fuels. In addition, NCRP has indicated that it will normally blend and store the processed CTW for less than 10 days prior to burning the material as a fuel. 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 CTW 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 Btu per pound (Btu/lb) presumptively satisfy this criterion.² NCRP referenced the analyzed composite samples of CTW collected by National Salvage for CPI USA North Carolina in a previous NHSM determination³ that stated the average as-received lower heating value (LHV) of that CTW was 5,083 Btu/lb as noted in the data attached to your request.

¹ See Letter dated April 3, 2012 from Becky Weber, Director, Air and Waste Management Division, US EPA Region 7, to Mr. Gregory Haug, PE of Resource Enterprises, LLC. <http://www.epa.gov/osw/nonhaz/define/pdfs/Lhoist-engineered-fuels.pdf>

² 78 Fed. Reg. 9172 (Feb. 7, 2013).

³ http://ncair.org/permits/memos/NHSM_Determination_CPI_USA-NC.pdf

NCRP also referenced the analyzed composite samples of CTW collected by Craven County Wood Energy in a previous NHSM determination⁴ that stated the average as-received lower heating value (LHV) of that CTW was 6,277 Btu/lb as noted in the data attached to your request.

Since the processed CTW will have an average heat content greater than 5,000 Btu/lb (approximately 5,680 Btu/lb LHV), the proposed fuel from the processed material satisfies this legitimacy criterion. The NC DAQ has determined that the material has meaningful heating value and meets the legitimacy criterion under 40 CFR 241.3(d)(1)(ii).

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.”⁵

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.*”⁶ 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.⁷

The NC DAQ reviewed the concentrations of the following contaminants in the CTW:

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

⁴ http://ncair.org/permits/memos/AppDet_2400_Secondary.pdf

⁵ 40 CFR 241.3(d)(1)(iii) (February 7, 2013) (*emphasis added*). Note effective April 8, 2013; however, this rule revision does not affect the outcome of this determination.

⁶ 40 CFR 241.2 (February 7, 2013) (*emphasis added*).

⁷ 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 modification. 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 (SO₂). 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 (Cl₂), hydrogen fluoride (HF), nitrogen oxides (NO_x), sulfur dioxide (SO₂), 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).

Designed, not Permitted to Burn

To determine whether a NHSM satisfies the legitimacy criteria, the current rule requires that the contaminant levels in the NHSM be compared against the levels in “traditional fuels which the combustion unit is designed to burn.”⁸

Further, the US EPA issued a Guidance Concept Paper indicating its intent to “address questions raised by industry, assist them in making determinations under the rule, and ensure their use of the flexibility embodied in the rule.”⁹ The Agency forecasted that the guidance would include a compilation of data it had collected on contaminant levels in traditional fuels which could be used by industry and other interested parties in the contaminant level comparison.

The guidance was provided by US EPA on November 29, 2011. It consists of three tables that provide a range of compiled contaminant concentrations for coal, untreated wood and biomass materials, and fuel oils.¹⁰ The table does not distinguish between concentration levels of different coal ranks (i.e., anthracite, bituminous, sub-bituminous, and lignite) or different types of biomass (i.e., wood, bark, biogas, hogged fuel, and agricultural plant residues).¹¹ This approach is consistent with the NHSM rule revisions that US EPA finalized on February 7, 2013.

The US EPA codified the meaning of “designed to burn” to include “a traditional fuel that can be or is burned in the particular type of boiler, whether or not the combustion unit is permitted to burn that traditional fuel.”¹² Also, in the preamble of final rule US EPA clarified the language regarding potential fuel category groups that any grade/rank (e.g. anthracite, lignite, bituminous and sub-bituminous coal) could be used in the traditional fuel contaminant levels of “designed to burn” fuel for comparison purposes.¹³

NCRP is proposing to burn the processed CTW in their existing boiler systems. NCRP has indicated that their boiler systems are designed to burn solid fuels, including coal, wood, fuel oil, tired-derived fuel, pelletized paper fuel and flyash briquettes, but are currently permitted to burn non-CISWI wood and poultry litter. In accordance with US EPA’s interpretation of “designed to burn,” the NC DAQ compared the concentrations of contaminants in the CTW to the contaminant levels in coal and woody biomass materials as provided in the November 29, 2011 guidance document and literature values.

Results of the Contaminant Comparison

The US EPA has indicated that a variety of comparisons could be made. For example, the highest contaminant levels in the NHSM could be compared against the highest contaminant levels in the relevant traditional fuels. Alternatively, the average values of the NHSM could be compared with the average values of the traditional fuels. “Anything less could result in ‘traditional fuel’ samples being considered solid waste if burned in the very combustion units designed to burn them – not the Agency’s intent in either the 2011 NHSM

⁸ 40 CFR 241.3(d)(1)(iii) (February 7, 2013).

⁹ US EPA, “Non-Hazardous Secondary Materials (NHSM) Rule: Comparable Contaminant Guidance Concept Paper” (July 11, 2011). <http://www.epa.gov/osw/nonhaz/define/pdfs/nhsnr-concept.pdf>

¹⁰ US EPA, “Contaminant Concentrations in Traditional Fuels: Tables for Comparison” (November 29, 2011). http://www.epa.gov/osw/nonhaz/define/pdfs/nhsm_cont_tf.pdf

¹¹ This, despite the fact that a coal fired boiler is designed differently based on the rank of coal it will burn.

¹² 78 Fed. Reg. 9213 (Feb. 7, 2013).

¹³ 78 Fed. Reg. 9148 (Feb. 7, 2013).

final rule or February 7, 2013 NHSM final rule.”¹⁴ However, using different bases for comparison could lead to different results. The US EPA warned that “[i]t would not be appropriate to compare an average NHSM contaminant value to the high end of a traditional fuel range, as the existence of an average implies multiple data points from which a more suitable statistic (*e.g.*, range or standard deviation) could have been calculated.” Finally, the US EPA warned that “in the context of an inspection or enforcement action, the Agency will evaluate the appropriateness of alternative methodologies and data sources on a case-by-case basis when determining whether the legitimacy criteria have been met.”¹⁵ The NC DAQ chose to use the maximums and averages for the contaminant comparison while focusing on the biomass average values.


NCRP referenced the analyzed contaminant levels of composite samples of CTW supplied by National Salvage to CPI USA North Carolina in a previous NHSM determination¹⁶. A summary of the measured contaminant levels and the contaminant levels in coal and biomass materials was provided as attachment to that letter. The contaminant levels for were compared to the biomass averages from US EPA’s Office of Air Quality Planning and Standards (OAQPS) database. All contaminants show that the measured contaminant levels in the CTW are within the range of contaminant concentrations in the traditional fuel (biomass and coal) that the existing boiler systems actually burn or is capable of burning (utilizing maximum and average values).

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

Conclusion

As described in the letter received from NCRP on July 20, 2015, the creosote treated wood is processed and does meet the legitimacy criteria provided in 40 CFR 241.3(d)(1). Therefore, the NC DAQ has determined that CTW is not a solid waste when used as fuel in a combustion unit and can be classified as non-CISWI wood. As a result of this determination, the existing boilers 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.

Sincerely,


for William D. Willets, P.E., Chief, Permitting Section
Division of Air Quality, NCDEQ

Attachment

c: Fayetteville Regional Office
Central Files

¹⁴ 78 Fed. Reg. 9151 (Feb. 7, 2013).

¹⁵ 78 Fed. Reg. 9151 (Feb. 7, 2013).

¹⁶ http://ncair.org/permits/memos/NHSM_Determination_CPI_USA-NC.pdf

of two representative types of creosote treated wood, CTRT and CTUP, fuel concentrations. The results are contained in Table 2-1.

Table 2-1 presents a summary of analytically measured contaminant concentration ranges based on data collected by U.S. EPA for coal and biomass compared to the analytical data from one CTRT sample and one CTUP sample from potential suppliers in the vicinity of the Southport facility. The CTRT and CTUP data clearly fall below the typical ranges expected for coal and the types of wood listed in the permit for combustion. It is anticipated that the contaminant concentrations of all creosote treated wood received at the Southport facility will have compositions within the range of traditional fuels that the boilers are capable of accommodating, and therefore no change in emissions from the boilers is anticipated.

Table 2-1, Fuel concentration comparisons to CTRT and CTUP

Metals	Range (ppmw)			
	Coal ¹	Biomass ¹	CTR ²	CTUP ³
Antimony	ND - 6.9	ND - 6.0	<1.3	<1.1
Arsenic	ND - 174	ND - 298	2.5	0.64
Beryllium	ND - 206	ND - 10	<0.32	<0.28
Cadmium	ND - 19	ND - 178	<0.25	<0.23
Chromium	ND - 168	ND - 240	9.6	0.88
Cobalt	ND - 25.2	ND - 213	<3.2	<2.8
Lead	ND - 148	ND - 229	6.1	2.1
Manganese	ND - 512	ND - 15,8000	94.5	71.9
Mercury	MD - 3.1	ND - 1.1	0.065	<0.042
Nickel	ND - 730	ND - 175	5.1	<2.3
Selenium	ND - 74.3	ND - 9.0	<1.3	<1.1
Halogens				
Chlorine	ND - 9,080	ND - 5,200	NA	NA
Fluorine	ND - 178	ND - 128		
Precursors				
Nitrogen	13,600 - 54,000	2,200 - 4,600	1,200	1,300
Sulfur	740 - 61,300	ND - 6,100	700	900

- 1) US EPA's Contaminant Concentrations in Traditional Fuels: Table for Comparison (Nov. 29, 2011). http://www.epa.gov/osw/nonhaz/define/pdfs/nhsm_cont_tf.pdf
- 2) Coastal Carolina Clean Power (CCCP) fuel analysis results for CTRT
- 3) CCCP fuel analysis results for CTUP

Appendix A
Comparison of Contaminant Levels in Creosote Treated Wood with Traditional Fuels
Craven County Wood Energy, L.P.

Metal elements - dry basis		Coal		Wood & Biomass		Fuel Oils		CCWE Tested Concentrations in Creosote Treated Wood				
Contaminant	Units	Full Range ^{1,2}	Full Range ^{1,2}	Full Range ^{1,2}	Full Range ^{1,2}	Full Range ^{1,2}	Utility Poles 9/4/2013	Railroad Ties 10/10/2013	Utility Poles 10/10/2013	Utility Poles 11/18/2013	Maximum	Status
Antimony (Sb)	ppm	ND - 10	ND - 26	ND - 15.7	ND - 13	ND - 15.7	<.678	<.500	<.500	<.791	0	Within range of all fuels
Arsenic (As)	ppm	ND - 174	ND - 298	ND - 19	ND - 13	ND - 19	<.136	<.100	<.100	<.158	0	Within range of all fuels
Beryllium (Be)	ppm	ND - 206	ND - 10	ND - 19	ND - 19	ND - 19	<.0678	<.0500	<.0500	<.0791	0	Within range of all fuels
Cadmium (Cd)	ppm	ND - 28 ⁴	ND - 17	ND - 1	ND - 1	ND - 1	0.244	0.291	<.100	22.3	22.3	Within range of Coal
Chromium (Cr)	ppm	ND - 168	ND - 340	ND - 37	ND - 37	ND - 37	0.937	4.84	0.67	1.44	4.84	Within range of all fuels
Cobalt (Co)	ppm	ND - 30	ND - 213	ND - 9	ND - 9	ND - 9	<.678	1	<.500	<.791	1	Within range of all fuels
Lead (Pb)	ppm	ND - 148	ND - 340	ND - 57	ND - 57	ND - 57	2.75	5.96	0.542	0.606	5.96	Within range of all fuels
Manganese (Mn)	ppm	ND - 512	ND - 15,800	ND - 3,200	ND - 3,200	ND - 3,200	18.3	123	6.33	61.9	123	Within range of all fuels
Mercury (Hg)	ppm	ND - 3.1	ND - 1.1	ND - 0	ND - 0	ND - 0	<.018	<.0133	<.0133	<.021	0	Within range of all fuels
Nickel (Ni)	ppm	ND - 730	ND - 540	ND - 270	ND - 270	ND - 270	0.742	10.8	<.250	0.422	10.8	Within range of all fuels
Selenium (Se)	ppm	ND - 74.3	ND - 9	ND - 4	ND - 4	ND - 4	1.42	<.1	1.24	<.158	1.42	Within range of all fuels
Non-metal elements - dry basis												
Chloride (Cl)	ppm	ND - 9,080	ND - 5,400	ND - 1,260	ND - 1,260	ND - 1,260	NA	11.9	12	32.6	32.6	Within range of all fuels
Fluoride (F)	ppm	ND - 178	ND - 300	ND - 14	ND - 14	ND - 14	NA	4.14	7.6	<.158	7.6	Within range of all fuels
Sulfur (S)	ppm	740 - 61,300	ND - 8,700	ND - 57,000	ND - 57,000	ND - 57,000	824	282	309	348	824	Within range of all fuels
HAP compounds												
PAH ³	ppm	6	253	3,900	58,555 ⁵	19,421	31,183	54,893	21,513	54,893	54,893	Within range of Fuel Oils

¹ND = Non Detect

²Coal, Wood & Biomass, and Fuel Oil ranges are from U.S. EPA's "Contaminant Concentrations in Traditional Fuels: Tables for Comparison" except as noted.

³CCWE tested for 17 PAH compounds.

⁴Gluskoter, H.J. and Lindahl, P.C., (1973), Cadmium - mode of occurrence in Illinois coals. Science, (188), 264-266.

⁵"Characteristics of Spilled Oils, Fuels, and Petroleum Products: 1. Composition and Properties of Selected Oils" U.S. EPA, (2003), Table 12.18.