

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **032013-005**

Project Number: 2012-07-058
Installation Number: 163-0060

Parent Company: Hearthwoods Biofuels

Parent Company Address: 6377 Highway V, Curryville, MO 63339

Installation Name: Hearthwood Biofuels

Installation Address: 6377 Highway V, Curryville, MO 63339

Location Information: Pike County, S29, T52N, R4W

Application for Authority to Construct was made for:

A wood pellet manufacturing plant. The equipment was constructed prior to receipt of a permit from the Missouri Department of Natural Resources. Obtaining a permit is part of a remedial action required by the Air Pollution Control Program. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

MAR 08 2013

EFFECTIVE DATE



DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Departments' Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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Permit No.	
Project No.	2011-08-086

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Hearthwood Biofuels
Pike County, S29, T52N, R4W

1. Emissions Limitation
 - A. Hearthwood Biofuels shall emit less than 10.0 tons of PM_{2.5} in any consecutive 12-month period from the entire installation. Emission points and activities from the entire installation are listed in Table 1 of the "Project Review" section.
 - B. Attachment A or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 1.A.
2. Record Keeping and Reporting Requirements
 - A. Hearthwood Biofuels shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
 - B. Hearthwood Biofuels shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2012-07-058
Installation ID Number: 163-0060
Permit Number:

Hearthwood Biofuels
6377 Highway V
Curryville, MO 63339

Complete: July 19, 2012

Parent Company:
Hearthwood Biofuels
6377 Highway V
Curryville, MO 63339

Pike County, S29, T52N, R4W

REVIEW SUMMARY

- Hearthwood Biofuels has applied to permit an existing wood pellet manufacturing plant.
- HAP emissions are expected from the proposed equipment but only in amounts less than their respective SMAL.
- None of the NSPS apply to the installation.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Conditioned potential emissions of all pollutants are less than their respective *de minimis* level.
- This installation is located in Pike County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since the conditioned potential emissions of the application are below *de minimis* levels

- Emissions testing is not required for the equipment.
- No operating permit is required for this installation.
- Approval of this permit is recommended with special conditions.

INSTALLATION AND PROJECT DESCRIPTION

Hearthwood Biofuels has applied to permit an existing plant that manufactures wood pellets from sawdust. The equipment was constructed prior to receipt of a permit from the Missouri Department of Natural Resources and obtaining this permit is part of a remedial action required by the Air Pollution Control Program. Sawdust is transported from an adjacent sawmill (Pioneer Lumber Company), ground and dried before being pelletized in a pellet mill. After pelletizing, the product is cooled and screened before being bagged for shipment. The facility has a maximum hourly design rate (MHDR) of 3 tons of pellets produced per hour. The equipment and activities at the installation include the following.

Table 1: Installation Equipment/Activities List

Emission Points	Equipment/Activities
EP-1	Sawdust Load-in to Trailer
EP-2	Sawdust Load-in to Conveyor
EP-3	Hammermill
EP-4	Pneumatic Conveyor to Dryer
EP-5	Dryer
EP-6	Pneumatic Conveyor to Hammermill
EP-7	Hammermill
EP-8	Pneumatic Conveyor to Bin
EP-9	Bin Discharge
EP-10	Conveyor Discharge to Pelletizer
EP-11	Pelletizer
EP-12	Discharge to Cooling Belt
EP-13	Cooling Belt
EP-14	Pellet Screen
EP-15	Pellet Elevator
EP-16	Conveyor Belt
EP-17	Bagging
EP-18	Raw Material Hauling
EP-19	Vehicular Activity from Loaders
EP-20	Product Hauling

No control device is being used to control emissions. A cyclone is connected to the outlet of the dryer but its main purpose is for sawdust recovery and not for pollution control. The dryer is sawdust-fired and can burn a maximum of 1,100 lb/hr (0.55 tph).

Hearthwood biofuel and Pioneer Lumber Company are not considered part of the same installation. Even though they share the same Standard Industrial Classification (SIC) code (2421) and are on adjacent properties, they are not under “common control” for the following reasons.

- The facilities do not have the same ownership.
- The facilities do not share any processing equipment, property, or pollution control devices.
- Each facility is responsible for its own compliance with air quality control requirements.
- The facilities do not share common employees or administrative functions such as payroll activities, employee benefits, health plans, retirement funds, and etc.
- The facility can continue its operations by transporting sawdust from nearby mills within a 20-25 mile radius if the lumber company ceases operations.

The installation is a minor source for construction permits and is not required to apply for an operating permit because emissions of all pollutants are conditioned below *de minimis* levels and no federal regulation (NSPS, MACT or NESHAP) applies to the installation.

EMISSIONS/CONTROLS EVALUATION

Particulate emissions from sawdust load-in, load-out, and conveying were calculated using emission factors for sawdust handling (scc code 3-07-008-03) from the Environmental Protection Agency (EPA) Factor Information Retrieval (FIRE) software. Particulate emissions from the Hammermills and the pelletizer were estimated using the log sawing emission factor (scc code 3-07-008-02) from FIRE. FIRE only lists emission factors for PM₁₀ and PM. PM_{2.5} emissions were calculated assuming that 56.0% of the PM₁₀ emissions are PM_{2.5}. This percentage was taken from Appendix B.1, *Particle Size Distribution Data and Sized Emission Factors for Selected Source*, (10/86) of EPA document AP-42, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition.

Particulate emissions from pellet handling and screening were estimated using the drop point equations in AP-42, Chapter 13.2.4, *Aggregate Handling and Storage Piles*, (11/06). Particulate emissions from hauling and vehicular activities were calculated using emission factors calculated from the predictive equations in AP-42, Section 13.2.2, *Unpaved Roads*, (11/06).

PM_{2.5}, PM₁₀, PM, NO_x, CO, VOC, CO₂ and methane (CH₄) emissions from the sawdust-fired burner were calculated from emission factors in AP-42, Section 10.6.2, *Particleboard Manufacturing* (6/02). This chapter of AP-42 does not list an emission factor for SO_x so the SO_x emissions were calculated using the emission factor from AP-42, Chapter 1.6, *Wood Residue Combustion in Boilers*, (9/03). The CO₂e emissions were calculated by multiplying the CO₂ and CH₄ emissions by their respective 100 year Global Warming Potential (GWP, 1 for CO₂ and 21 for CH₄) and adding the results. HAP emissions from the sawdust-fired burner were calculated using emission factors from one of the following sources.

- EPA's National Center for Environmental Assessment (NCEA) document, *The Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States: The Year 2000 Update*, Table 4-14 (3/05).
- The National Council for Air and Stream Improvement, Inc. (NCASI) Technical Bulletin No. 858A, Table 20A (1/03).
- AP-42, Section 1.6, *Wood Residue Combustion in Boilers*, Table 1.6-3, (9/03)
- AP-42, Section 10.6.2, *Particleboard Manufacturing*, Table 10.6.2-3, (6/02).

Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year.) The following table provides an emissions summary for this project. The facility accepted an installation wide limit of 10.0 tons per year of PM_{2.5} so that modeling would not be required.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Application	New Installation Conditioned Potential
PM _{2.5}	10.0	N/A	N/A	16.31	<10.0
PM ₁₀	15.0	N/A	N/A	23.01	14.10
PM	25.0	N/A	N/A	37.68	23.10
SO _x	40.0	N/A	N/A	1.08	0.62
NO _x	40.0	N/A	N/A	35.48	20.28
VOC	40.0	N/A	N/A	21.02	12.02
CO	100.0	N/A	N/A	74.90	42.82
CH ₄	N/A	N/A	N/A	3.42	1.95
CO ₂	N/A	N/A	N/A	7,529.22	4,304.29
GHG-Mass	¹ 250.0	N/A	N/A	7,532.64	4,306.24
CO ₂ e	¹ 100,000	N/A	N/A	7,600.96	4,345.30
HAPs	10.0/25.0	N/A	N/A	1.09	0.62

N/A – Not Applicable

Note 1: PSD permit only required if both GHG-mass and CO₂e emissions exceed their respective significance levels.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Conditioned potential emissions of all pollutants are less than their respective *de minimis* level.

APPLICABLE REQUIREMENTS

Hearthwood Biofuels shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Chia-Wei Young
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 26, 2011, received August 30, 2011, designating Hearthwoods Biofuels as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Northeast Regional Office Site Survey, dated September 29, 2011.

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	
CFR	Code of Federal Regulations	National Emissions Standards for Hazardous Air Pollutants
CO	carbon monoxide	NO_x	nitrogen oxides
CO₂	carbon dioxide	NSPS	New Source Performance Standards
CO_{2e}	carbon dioxide equivalent	NSR	New Source Review
COMS	Continuous Opacity Monitoring System	PM	particulate matter
CSR	Code of State Regulations	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
dscf	dry standard cubic feet	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
EQ	Emission Inventory Questionnaire	ppm	parts per million
EP	Emission Point	PSD	Prevention of Significant Deterioration
EPA	Environmental Protection Agency	PTE	potential to emit
EU	Emission Unit	RACT	Reasonable Available Control Technology
fps	feet per second	RAL	Risk Assessment Level
ft	feet	SCC	Source Classification Code
GACT	Generally Available Control Technology	scfm	standard cubic feet per minute
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. Simon Gnehm
Process Engineer
Hearthwood Biofuels
6377 Highway V
Curryville, MO 63339

RE: New Source Review Permit - Project Number: 2012-07-058

Dear Mr. Gnehm:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions and your new source review permit application. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Chia-Wei Young, at the Department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:cyl

Enclosures

c: Northeast Regional Office
PAMS File: 2012-07-058

Permit Number: