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: 032018-005 Project Number: 2017-09-042
Installation Number: 139-0053

Parent Company: Independent Stave Company

Parent Company Address: 1078 South Jefferson Street, Lebanon, MO 65536

Installation Name: Missouri Mulch

Installation Address: 55 Stave Mill Road, New Florence, MO 63363

Location Information: Montgomery County, S34, T48N, R05W

Application for Authority to Construct was made for:
An existing mulch plant. This review was conducted in accordance with Section (6), 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.

Prepared by
Sam Anzalone
New Source Review Unit

Director or Designee
Department of Natural Resources

MAR 13 2018
Effective Date

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 Enforcement and Compliance Section of 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 Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department's regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's 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 source(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 using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
http://dnr.mo.gov/regions/

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."

Missouri Mulch
Montgomery County, S34, T48N, R05W

1. Haul Road Watering
   A. Missouri Mulch shall water haul roads whenever conditions exist which would cause visible fugitive emissions to enter the ambient air beyond the property boundary.

   B. Watering may be suspended when the ground is frozen, during periods of freezing conditions when watering would be inadvisable for traffic safety reasons, or when there will be no traffic on the roads.

2. PM_{10} Emission Limitation
   A. Missouri Mulch shall emit less than 15.0 tons of PM_{10} in any consecutive 12-month period from the entire installation (see table 2 in project description).

   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 2.A.

3. Record Keeping and Reporting Requirements
   A. Missouri Mulch 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. These records shall include SDS for all materials used.

   B. Missouri Mulch shall report to the Air Pollution Control Program's Compliance/Enforcement Section, by mail at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW
Project Number: 2017-09-042
Installation ID Number: 139-0053
Permit Number: 032018-005

Installation Address:
Missouri Mulch
55 Stave Mill Road
New Florence, MO 63363

Parent Company:
Independent Stave Company
1078 South Jefferson Street
Lebanon, MO 65536

Montgomery County, S34, T48N, R05W

REVIEW SUMMARY

- Missouri Mulch has applied for authority to install an existing mulch plant that has not been permitted.
- The application was deemed complete on October 02, 2017.
- HAP emissions are not expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the project.
- None of the NESHAPs apply to this project. None of the currently promulgated MACT regulations apply to the proposed equipment.
- Undocumented watering is being used to control the particulate matter emissions from the haul roads in this permit.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM are above the de minimis level, but below major source levels. All other criteria pollutants are below de minimis levels.
- This installation is located in Montgomery County, an attainment/unclassified 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 all criteria pollutants besides PM are below de minimis. Potential emissions of PM are above de minimis but below major source levels. There are no modeling requirements for PM.

- Emission testing is not required for the equipment as a part of this permit. Testing may be required as part of other state, federal or applicable rules.

- A Basic Operating Permit application is required for this installation within 30 days of this permit's issuance.

- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Missouri Mulch (139-0053) is an mulch plant that uses wood supplied form New Florence Wood Products (139-0016) and creates mulch products. Missouri Mulch and New Florence Wood Projects are separate installations for EIQ reporting. However, because they share the same owner, are in close physical proximity and used products produced by each other they are considered one installation for permitting purposes.

New Florence Wood Products operates a wood processing installation in Montgomery County. This installation manufactures staves and heading from stave logs. The existing process includes wood saws, debarkers, a chipper, and a wood hog. Each of these processes generates wood waste.

New Florence Wood Products is considered a minor source for construction permitting purposes and a basic source for operating permitting purposes. They currently operate under a basic operating permit expiring November 14, 2022. Missouri Mulch will also need to get a basic operating permit because they share PTE with New Florence Wood Products.

No New Source Review permits have been issued to Missouri Mulch from the Air Pollution Control Program. The following New Source Review permits have been issued to New Florence Wood Products from the Air Pollution Control Program and are included in the total PTE.

Table 1: Permit History

Location	Permit Number	Description
New Florence Wood Products (139-0016)	0997-031	Increase Production
New Florence Wood Products (139-0016)	0298-008	Debarker, splitter, resaw, edgers, cut-off saws
New Florence Wood Products (139-0016)	0399-019	Wood-fired heater and Storage bin
New Florence Wood Products (139-0016)	0599-015	New chipper, saws, and debarker
New Florence Wood Products (139-0016)	012002-013	Band-type resaw
New Florence Wood Products (139-0016)	082013-013	Dry Kilns
New Florence Wood Products (139-0016)	112013-006	Dry Kilns
New Florence Wood Products (139-0016)	052015-009	Dry Kilns

PROJECT DESCRIPTION

Missouri Mulch has installed a mulch plant that is fed from the wood (Bark, Log Ends, Hogged Wood, Wood Chips, Cult Bolts) at the mill already onsite besides Pine Hogged Wood and Cedar Logs. The pine and cedar is hauled in from an outside source (EU-01). The unprocessed wood is stored in piles (EU-03 – EU-09) before being loaded into grinder (EU-12). After the grinder, a conveyor (EU-13) piles the grounded wood in storage piles (EU-14 - EU-19). A Trammel Dye screen (EU-22) is used to dye mulch (a mix of log ends, hogged wood and cult bolts) and wood chips. There is a conveyor (EU-23) off of the dye screen that piles the dyed wood. The dyes in the process have no VOCs or HAPs. A bagger (EU-28) is used to bag the dyed mulch, dyed wood chips, ground cedar and ground bark. All wood products have the able to loaded into a trailer to be hauled off site.

The grinder, dye process and bagger can only process one type of wood at a time besides mulch. The MDHR for the respective equipment is based on timed studies done by the company. All the of the emission from the process besides the haul roads are considered uncontrolled. Undocumented watering will be used to control the haul roads.

There are track mounted engines on the grinder, trammel screen and bagger. The engines associated with the equipment meet the definition of non-road engine 40 CFR 89.2 (1)(i), therefore the emissions from these have not been calculated toward the PTE. *NSPS IIII "Standards of performance for Stationary Compression Ignition Internal Combustion Engines" and MACT ZZZZ "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines"* do not apply because the engines meet the definition of nonroad.

See the table below for summary of the emission units and MHDR.

Table 2. Missouri Mulch Emission Units

Emission Unit	Description	Type of Wood	MDHR	Max MHDR
EU-01	Haul Road for Wood in	Pine Hogged Wood	5614 lb/hr	0.047 VMT
		Bark	1066 lb/hr	
		Hogged Wood	5614 lb/hr	
		Wood Chips	5614 lb/hr	
		Cedar Log	5614 lb/hr	
EU-02	Loader from dump pile to storage pile	Pine Hogged Wood	5614 lb/hr	2.88 VMT
		Bark	10866 lb/hr	
		Log Ends	2667 lb/hr	
		Hogged Wood	5614 lb/hr	
		Wood Chips	5614 lb/hr	
		Cult Bolts	583 lb/hr	
		Cedar Log	5614 lb/hr	
EU-03	Storage Pile	Pine Hogged Wood	0.109 Acres	0.109 Acres
EU-04	Storage Pile	Bark	0.126 Acres	0.126 Acres
EU-05	Storage Pile	Log Ends	0.126 Acres	0.126 Acres
EU-06	Storage Pile	Hogged Wood	0.161 Acres	0.161 Acres
EU-07	Storage Pile	Wood Chips	0.344 Acres	0.344 Acres
EU-08	Storage Pile	Cult Bolts	0.126 Acres	0.126 Acres
EU-09	Storage Pile	Cedar Log	0.109 Acres	0.109 Acres
EU-10	Load into Grinder	Pine Hogged Wood	5614 lb/hr	5.33 tph
		Bark	10866 lb/hr	
		Log Ends[1]	2667 lb/hr	
		Hogged Wood[1]	5614 lb/hr	
		Wood Chips	5614 lb/hr	
		Cult Bolts[1]	583 lb/hr	
		Cedar Logs	5614 lb/hr	
EU-11	Loader Haul Road	Pine Hogged Wood	5614 lb/hr	1.80 VMT
		Bark	10866 lb/hr	
		Log Ends	2667 lb/hr	
		Hogged Wood	5614 lb/hr	
		Wood Chips	5614 lb/hr	
		Cult Bolts	583 lb/hr	
		Cedar Logs	5614 lb/hr	
EU-12	Grinder (Vermeer TG5000)	Pine Hogged Wood	5614 lb/hr	5.33 tph
		Bark	10866 lb/hr	
		Log Ends[1]	2667 lb/hr	
		Hogged Wood[1]	5614 lb/hr	
		Wood Chips	5614 lb/hr	
		Cult Bolts[1]	583 lb/hr	
		Cedar Logs	5614 lb/hr	

Table 2. Cont.

Emission Unit	Description	Type of Wood	MDHR	Max MHDR
EU-13	Grinder Conveyor	Ground Pine Hogged Wood	5614 lb/hr	5.33 tph
		Ground Bark	10866 lb/hr	
		Ground Mulch[1]	11811 lb/hr	
		Ground Wood Chips	5614 lb/hr	
		Ground Cedar Logs	5614 lb/hr	
EU-14	Storage Pile	Ground Pine Hogged Wood	0.084 Acres	0.084 Acres
EU-15	Storage Pile	Ground Bark	0.142 Acres	0.142 Acres
EU-16	Storage Pile	Ground Mulch	0.142 Acres	0.142 Acres
EU-17	Storage Pile	Ground Wood Chips	0.142 Acres	0.142 Acres
EU-18	Storage Pile	Ground Cedar Logs	0.084 Acres	0.084 Acres
EU-19	Storage Pile	Waste Wood	0.312 Acres	0.312 Acres
EU-20	Load into Dye Screen	Mulch	11811 lb/hr	4.43 tph
		Wood Chips	5614 lb/hr	
EU-21	Loader Haul Roads	Mulch	11811 lb/hr	0.71 VMT
		Wood Chips	5614 lb/hr	
EU-22	Trammel Dye Screen (Vermeer TR521)	Mulch	11811 lb/hr	4.43 tph
		Wood Chips	5614 lb/hr	
EU-23	Dye Screen Conveyor	Mulch	11811 lb/hr	4.43 tph
		Wood Chips	5614 lb/hr	
EU-24	Storage Pile	Dyed Mulch	0.138 Acres	0.138 Acres
EU-25	Storage Pile	Dyed Wood Chips	0.138 Acres	0.138 Acres
EU-26	Load into Bagger	Dyed Mulch	11811 lb/hr	5.33 tph
		Dyed Wood Chips	5614 lb/hr	
		Ground Cedar	5614 lb/hr	
		Ground Bark	10866 lb/hr	
EU-27	Loader Haul Roads	Dyed Mulch	11811 lb/hr	1.62 VMT
		Dyed Wood Chips	5614 lb/hr	
		Ground Cedar	5614 lb/hr	
		Ground Bark	10866 lb/hr	
EU-28	Bagger	Dyed Mulch	11811 lb/hr	5.33 tph
		Dyed Wood Chips	5614 lb/hr	
		Ground Cedar	5614 lb/hr	
		Ground Bark	10866 lb/hr	

Table 2. Cont.

Emission Unit	Description	Type of Wood	MDHR	Max MHDR
EU-29	Load into Trailer	Ground Pine Hogged Wood	5614 lb/hr	5.33 tph
		Ground Bark	10866 lb/hr	
		Dyed Mulch	11811 lb/hr	
		Dyed Wood Chips	5614 lb/hr	
		Cult Bolts	583 lb/hr	
		Ground Cedar Logs	5614 lb/hr	
		Bag Product	11811 lb/hr	
		Unground Hogged Wood	5614 lb/hr	
		Unground Wood Chips	5614 lb/hr	
EU-30	Loader Haul Roads	Ground Pine Hogged Wood	5614 lb/hr	0.47 VMT
		Ground Bark	10866 lb/hr	
		Dyed Mulch	11811 lb/hr	
		Dyed Wood Chips	5614 lb/hr	
		Cult Bolts	583 lb/hr	
		Ground Cedar Logs	5614 lb/hr	
		Bag Product	11811 lb/hr	
		Unground Hogged Wood	5614 lb/hr	
		Unground Wood Chips	5614 lb/hr	
EU-31	Haul Road out	Ground Pine Hogged Wood	5614 lb/hr	0.06 VMT
		Ground Bark	10866 lb/hr	
		Dyed Mulch	11811 lb/hr	
		Dyed Wood Chips	5614 lb/hr	
		Cult Bolts	583 lb/hr	
		Ground Cedar Logs	5614 lb/hr	
		Bag Product	11811 lb/hr	
		Unground Hogged Wood	5614 lb/hr	
		Unground Wood Chips	5614 lb/hr	

EMISSIONS/CONTROLS EVALUATION

Haul road emissions were calculated using the predictive equation found in AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 13.2.2 Unpaved Roads (November 2006). Emissions were considered controlled with undocumented watering.

Emission from the grinding, dying and bagging processes were taken from EPA Memorandum *Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in the Pacific North West Indian Country* issued

May 08 2014. The grinder and the dye screen emissions used the Log Debarking emission factor. All drop points and bagger emissions used the drop of dry material emission factor. The storage piles used the wind erosion of pile emission factor. All emissions were considered uncontrolled.

The following table provides an emissions summary for this project. Existing potential emissions were taken from Construction Permit 052015-009. Existing actual emissions were taken from the installation's 2016 EIQ. Potential emissions of the application represent the potential of the equipment, assuming continuous operation (8760 hours per year).

Table 3: Emissions Summary (tpy)

Pollutant	Regulatory *De Minimis* Levels	New Florence Wood Products (139-0016) Existing Potential Emissions	New Florence Wood Products Existing Actual Emissions (2016 EIQ)	Conditioned Potential Emissions of the Project (Missouri Mulch, 139-0053)	New Installation Conditioned Potential for both New Florence Wood Products and Missouri Mulch
PM	25.0	N/D	N/D	51.9	N/D
PM_{10}	15.0	74.52	22.9	<15.0	89.52
$PM_{2.5}$	10.0	N/D	15.29	2.47	N/D
SOx	40.0	N/D	0.28	N/A	N/D
NOx	40.0	N/D	2.4	N/A	N/D
VOC	40.0	2.68	1.4	N/A	2.68
CO	100.0	N/D	6.6	N/A	N/D
HAPs	10.0/25.0	0.74	N/D	N/A	0.74

N/A = Not Applicable; N/D = Not Determined

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM are above the de minimis level, but below major source levels. All other criteria pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

Missouri Mulch 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. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Operating Permits*, 10 CSR 10-6.065
- *Start-Up, Shutdown, and Malfunction Conditions,* 10 CSR 10-6.050
- *Submission of Emission Data, Emission Fees and Process Information,* 10 CSR 10-6.110
    - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.
- *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

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 1, 2017, received September 05, 2017, designating Independent Stave Company as the owner and operator of the installation.

Attachment A - PM_{10} 12-Month Rolling Total Emissions Tracking Sheet

Missouri Mulch
Montgomery County, S34, T48N, R05W
Project Number: 2017-09-042
Installation ID Number: 139-0053
Permit Number: 032018-005

This sheet covers the period from ____________ to ____________.

Month	Production (tons)	PM_{10} Composite Emission Factor (lb/ton)	Monthly PM_{10} Emissions[1] (lbs)	Startup, Shutdown and Malfunction PM_{10} Emissions[2] (lbs)	Monthly PM_{10} Emissions[3] (tons)	12-Month Rolling Total Emissions[4] (tons)
Example	*2,000*	*1.32*	*2640*	*0.0*	*1.32*	*14.46*
		1.32				
		1.32				
		1.32				
		1.32				
		1.32				
		1.32				
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		1.32				
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		1.32				
		1.32				
		1.32				
		1.32				
		1.32				

[1]Multiply the monthly production by the PM_{10} composite emission factor.
[2]As reported to the Air Pollution Control Program's Compliance/Enforcement Section according to the provisions of 10 CSR 10-6.050 for the month.
[3]Add the monthly PM_{10} emissions plus the SSM emissions from the same time period and divide by 2000.
[4]Add the monthly emissions (tons) to the sum of the monthly emissions from the previous eleven months.
A total of less than 15.0 tons of PM_{10} per consecutive 12 months is necessary for compliance.

APPENDIX A

Abbreviations and Acronyms

% .....percent
°F .....degrees Fahrenheit
acfm.....actual cubic feet per minute
BACT.....Best Available Control Technology
BMPs.....Best Management Practices
Btu.....British thermal unit
CAM .....Compliance Assurance Monitoring
CAS.....Chemical Abstracts Service
CEMS .....Continuous Emission Monitor System
CFR.....Code of Federal Regulations
CO.....carbon monoxide
CO_2.....carbon dioxide
CO_2e.....carbon dioxide equivalent
COMS.....Continuous Opacity Monitoring System
CSR.....Code of State Regulations
dscf.....dry standard cubic feet
EIQ.....Emission Inventory Questionnaire
EP.....Emission Point
EPA.....Environmental Protection Agency
EU .....Emission Unit
fps.....feet per second
ft.....feet
GACT .....Generally Available Control Technology
GHG.....Greenhouse Gas
gpm .....gallons per minute
gr.....grains
GWP .....Global Warming Potential
HAP.....Hazardous Air Pollutant
hr.....hour
hp .....horsepower
lb.....pound
lbs/hr.....pounds per hour
MACT.....Maximum Achievable Control Technology
$\mu g/m^3$.....micrograms per cubic meter
m/s.....meters per second
Mgal .....1,000 gallons
MW .....megawatt
MHDR.....maximum hourly design rate
MMBtu ....Million British thermal units
MMCF .....million cubic feet
MSDS.....Material Safety Data Sheet
NAAQS ....National Ambient Air Quality Standards
NESHAPs National Emissions Standards for Hazardous Air Pollutants
NO_x.....nitrogen oxides
NSPS .....New Source Performance Standards
NSR .....New Source Review
PM.....particulate matter
$PM_{2.5}$.....particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10} .....particulate matter less than 10 microns in aerodynamic diameter
ppm .....parts per million
PSD.....Prevention of Significant Deterioration
PTE .....potential to emit
RACT.....Reasonable Available Control Technology
RAL.....Risk Assessment Level
SCC .....Source Classification Code
scfm .....standard cubic feet per minute
SDS.....Safety Data Sheet
SIC.....Standard Industrial Classification
SIP.....State Implementation Plan
SMAL.....Screening Model Action Levels
SO_x.....sulfur oxides
SO_2.....sulfur dioxide
SSM.....Startup, Shutdown & Malfunction
tph .....tons per hour
tpy.....tons per year
VMT.....vehicle miles traveled
VOC .....Volatile Organic Compound

2017-09-042
New Florence Wood Products
Wood Mulch

Emission Unit	Description	Wood Type	MHDR (lb/hr)	Max MHDR (ton/hr)	Acreage	PM Emission Factor (lb/ton)	PM Emission Factor (ton/acre)	PM Emission Factor Source	PM Emissions (tpy)	PM10 Emission Factor (lb/ton)	PM10 Emission Factor (ton/acre)	PM10 Emission Factor Source	PM10 Emissions (tpy)	PM2.5 Emission Factor (lb/ton)	PM2.5 Emission Factor (ton/acre)	PM2.5 Emission Factor Source	PM2.5 Emissions (tpy)
					-												
		Pine Hogged Wood	5614		-								8.1056365				1.2609128
		Bark	1066		-												
EP-01	Wood in	Log Ends* (Mulch)	-	2.807	-		See Haul Road worksheet		28.504444		See Haul Road worksheet					See Haul Road worksheet	
		Hogged Wood (Mulch)	5614		-												
		Wood Chips	5614		-												
		Cult Bolts* (Much)	-		-												
		Cedar Logs	5614		-												
		Pine Hogged Wood	5614		-												
		Bark*	1066		-												
	Loader from	Log Ends* (Mulch)	583		-												
EP-02	dump pile to	Hogged Wood* (Mulch)	5614	2.807	-												
	storage pile	Wood Chips*	5614		-												
		Cult Bolts* (Much)	583		-												
		Cedar Logs	5614		-												
		*Supplied from in the mill located at the installation															
EP-03		Pine Hogged Wood	-	-	0.109	-	0.38		0.04142	-	0.19		0.02071	-	0.095		0.010355
EP-04		Bark	-	-	0.126	-	0.38		0.04788	-	0.19		0.02394	-	0.095		0.01197
EP-05		Log Ends (Mulch)	-	-	0.126	-	-		-	-	-		-	-	-		-
EP-06	Storage Pile	Hogged Wood (Mulch)	-	-	0.161	-	0.38	EPA Memo - Storage Piles	0.06118	-	0.19	EPA Memo - Storage Piles	0.03059	-	0.095	EPA Memo - Storage Piles	0.015295
EP-07		Wood Chips	-	-	0.344	-	0.38		0.13072	-	0.19		0.06536	-	0.095		0.03268
EP-08		Cult Bolts	-	-	0.126	-	0.38		0.04788	-	0.19		0.02394	-	0.095		0.01197
EP-09		Cedar Logs	-	-	0.109	-	0.38		0.04142		0.19		0.02071	-	0.095		0.010355
		Pine Hogged Wood	5614		-		-				-				-		
		Bark	10666		-		-				-				-		
		Log Ends (Mulch)	2667		-		-				-				-		
EP-10	Load in to Grinder	Hogged Wood (Mulch)	5614	5.333	-	0.0015	-	EPA Memo - Drop	0.0350378	0.0007	-	EPA Memo - Drop	0.016351	0.0001	-	EPA Memo - Drop	0.0001218
		Wood Chips	5614		-		-				-				-		
		Cult Bolts (Mulch)	583		-		-				-				-		
		Cedar Logs	5614		-		-				-				-		
		Pine Hogged Wood	5614		-												
		Bark	10666		-												
		Log Ends (Mulch)	2667		-												
EP-11	Loader Haul Road	Hogged Wood (Mulch)	5614	5.333	-		See Haul Road worksheet		28.504444		See Haul Road worksheet		8.1056365		See Haul Road worksheet		1.2609128
		Wood Chips	5614		-												
		Cult Bolts (Mulch)	583		-												
		Cedar Logs	5614		-												
		Pine Hogged Wood	5614		-		-				-				-		
		Bark	10666		-		-				-				-		
		Log Ends* (Mulch)			-		-				-				-		
EP-12	Grinder	Hogged Wood* (Mulch)	8864	5.333	-	0.024	-	EPA Memo - debarking	0.560605	0.012	-	EPA Memo - debarking	0.2803025	0.006	-	EPA Memo - debarking	0.1401512
		Cult Bolts*			-		-				-				-		
		Wood Chips	5614		-		-				-				-		
		Cedar Logs	5614		-		-				-				-		
	only grinds one type of wood at a time, the exception is mulch (Log Ends, Hogged Wood & cult bolts				-		-				-				-		
		Ground Pine Hogged Wood	5614		-		-				-				-		
		Ground Bark	10666		-		-				-				-		
		Ground Mulch	8864		-		-				-	EPA Memo - Drop			-		
EP-13	Conveyor	Ground Wood Chips	5614	5.333	-	0.0015	-	EPA Memo - Drop	0.0350378	0.0007	-		0.016351	0.0001	-	EPA Memo - Drop	0.0023359
					-		-				-				-		
		Ground Cedar Logs	5614		-		-				-				-		
EP-14		Ground Pine Hogged Wood	-	-	0.084	-	0.38		0.03192	-	0.19		0.01596	-	0.095		0.00798
EP-15		Ground Bark	-	-	0.142	-	0.38		0.05396	-	0.19	EPA Memo - Storage Piles	0.02698	-	0.095	EPA Memo - Storage Piles	0.01349
EP-16	Ground	Ground Mulch	-	-	0.142	-	0.38	EPA Memo - Storage Piles	0.05396	-	0.19		0.02698	-	0.095		0.01349
EP-17	Storage Pile	Ground Wood Chips	-	-	0.142	-	0.38		0.05396	-	0.19		0.02698	-	0.095		0.01349
EP-18		Ground Cedar Logs	-	-	0.084	-	0.38		0.03192	-	0.19		0.01596	-	0.095		0.00798
EP-19		Waste Wood Pile	-	-	0.312	-	0.38		0.03192	-	1.19		0.09996		0.095		0.00798
EP-20	Load into	Mulch	8864	4.432	-	0.0015	-	EPA Memo - Drop	0.0291182	0.0007	-	EPA Memo -	0.0135885	0.0001	-	EPA Memo -	0.0019412
	Dye Screen	Wood Chips	5614		-												
EU-21	Loader Haul Roads	Mulch	8864	4.432	-		See Haul Road worksheet		17.838484		See Haul Road worksheet		5.0726218		See Haul Road worksheet		0.7890971
		Wood Chips	5614		-												
EU-22	Trommel	Mulch	8864		-	0.024	-	EPA Memo - debarking	0.4658918	0.012	-	EPA Memo -	0.2329459	0.006	-	EPA Memo -	0.116473
	Dye Screen	Wood Chips	5614	4.432	-												
	Can only dye one type at a time				-												

EU-23	Conveyor	Dyed Mulch	8864		-	0.0015	-	EPA Memo - Drop	0.0291162	0.0007	-	EPA Memo -	0.0135885	0.0001	-	EPA Memo -	0.0019412
		Dyed Wood Chips	5614	4.432	-	0.0015	-		0	0.0007	-			0.0001	-		0
EU-24	Dyed	Dyed Mulch	-	-	0.138	-	0.38	EPA Memo -	0.05244	-	0.19	EPA	0.02622	-		EPA	0.01311
EU-25	Storage Pile	Dyed Wood Chips	-	-	0.138	-	0.38	Storage	0.05244	-	0.19	Memo -	0.02622	-	0.095	Memo -	0
EU-26	Load into Bagger	Dyed Mulch	8864		-												
		Dyed Wood Chips	5614	5.333	-	0.0015	-	EPA Memo - Drop	0.0350378	0.0007	-	EPA Memo - Drop	0.016351	0.0001	-	EPA Memo - Drop	0.0023359
		Ground Cedar	5614		-												
		Ground Bark	10666		-												
EU-27	Loader Haul Roads	Dyed Mulch	8864		-												
		Dyed Wood Chips	5614	5.333	-	See Haul Road worksheet			7.0134823	See Haul Road worksheet			1.9943816	See Haul Road worksheet			0.310246
		Ground Cedar	5614		-												
		Ground Bark	10666		-												
EU-28	Bagger	Dyed Mulch	8864		-												
		Dyed Wood Chips	5614	5.333	-	0.0015	-	EPA Memo - Drop	0.0350378	0.0007	-	EPA Memo - Drop	0.016351	0.0001	-	EPA Memo - Drop	0.0023359
		Ground Cedar	5614		-												
		Ground Bark	10666		-												
Can only bag one type at a time					-												
EU-29	Load into Trailer	Ground Pine Hogged Wood	5614		-	0.0015	-	EPA Memo - Drop	0.0350378	0.0007	-	EPA Memo - Drop	0.016351	0.0001	-	EPA Memo - Drop	0.0023359
		Ground Bark	10666		-	0.0015	-		0	0.0007	-		0	0.0001	-		0
		Dyed Mulch	8864		-	0.0015	-		0	0.0007	-		0	0.0001	-		0
		Dyed Wood Chips	5614		-	0.0015	-		0	0.0007	-		0	0.0001	-		0
		Cult Bolts	583	5.333	-	0.0015	-		0	0.0007	-		0	0.0001	-		0
		Ground Cedar Logs	5614		-	0.0015	-		0	0.0007	-		0	0.0001	-		0
		Bag Product	10666		-	0.0015	-		0	0.0007	-		0	0.0001	-		0
		Unground Hogged Wood	5614		-	0.0015	-		0	0.0007	-		0	0.0001	-		0
		Unground wood chip	5614		-	0.0015	-		0	0.0007	-		0	0.0001	-		0
EU-30	Loader Haul Roads	Ground Pine Hogged Wood	5614														
		Ground Bark	10666														
		Dyed Mulch	8864														
		Dyed Wood Chips	5614														
		Cult Bolts	583	5.333													
		Ground Cedar Logs	5614														
		Bag Product	10666														
		Unground Hogged Wood	5614														
		Unground wood chip	5614			See Haul Road worksheet			16.11863	See Haul Road worksheet			4.5835574	See Haul Road worksheet			0.7130182
EU-31	Haul Road out	Ground Pine Hogged Wood	5614		-												
		Ground Bark	10666		-												
		Dyed Mulch	8864		-												
		Dyed Wood Chips	5614		-												
		Cult Bolts	583	5.333	-												
		Ground Cedar Logs	5614		-	See Haul Road worksheet			7.0134823	See Haul Road worksheet			1.9943816	See Haul Road worksheet			0.310246
		Bag Product	10666		-												
		Unground Hogged Wood	5614		-												
		Unground wood chip	5614		-												

Total Emissions	PM	106.98591 tpy	PM10	30.928906 tpy	PM2.5 5.0845497 tpy
	Cond. PM	51.88637 tpy	PM10 Composite EF	1.324094 lb/ton	Cond. PM2 2.4659212

EPA Memo
Particulate Matter Potential to Emit Emission Facotrs for activities at sawmills, excluding boilers, located in pacific northwest indain country
May 08 2014

Activity	MHDR (tons/hr)	MHDR (trips/hr)	Truck Types Semi	Straight	Bucket	type	We*	Wf*
Wood in	2.8	0.104	100%				13	40
Storage pile load in	2.8	5.614			100%		4.2	4.7
Grinder Load in	5.3	10.666			100%		4.2	4.7
Dye Screen Load in	4.4	8.864			100%		4.2	4.7
Bagger Load in	5.3	10.666			100%		4.2	4.7
Storage pile load out	5.3	10.666			100%		4.2	4.7
Wood out	5.3	0.198	100%				13	40
title		0.000					0	0
title		0.000					0	0

Truck Type	We (tons)	Wf (tons)
Semi	13	40
Straight	10	25
Bucket	4.2	4.7
type		

truck type row must sum to 100% per each activity

1=empty
2=full
3=both

Activities

Road Segment ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14
D one way (feet)	1194	1354	446	211	403	117	827							
D one way (miles)	0.226	0.256	0.084	0.040	0.076	0.022	0.157	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wood in	3													
Storage pile load in		3												
Grinder Load in			3											
Dye Screen Load in				3										
Bagger Load in					3									
Storage pile load out						3								
Wood out							3							
title														
title														

W

Wood in	26.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Storage pile load in	0.000	4.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grinder Load in	0.000	0.000	4.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dye Screen Load in	0.000	0.000	0.000	4.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bagger Load in	0.000	0.000	0.000	0.000	4.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Storage pile load out	0.000	0.000	0.000	0.000	0.000	4.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wood out	0.000	0.000	0.000	0.000	0.000	0.000	26.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	26.50	4.45	4.45	4.45	4.45	4.45	26.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Paved

E(PM2.5) (lbs/VMT):	0.22316	0.09998	0.09998	0.09998	0.09998	0.09998	0.22316	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
E(PM10) (lbs/VMT):	1.43458	0.64273	0.64273	0.64273	0.64273	0.64273	1.43458	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
E(PM30) (lbs/VMT):	5.04487	2.26022	2.26022	2.26022	2.26022	2.26022	5.04487	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Eext(PM2.5) (lbs/VMT):	0.20438	0.09157	0.09157	0.09157	0.09157	0.09157	0.20438	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Eext(PM10) (lbs/VMT):	2.04378	0.91566	0.91566	0.91566	0.91566	0.91566	2.04378	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Eext(PM30) (lbs/VMT):	7.18721	3.22004	3.22004	3.22004	3.22004	3.22004	7.18721	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Wood in	0.04702	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage pile load in	0	2.879302	0	0	0	0	0	0	0	0	0	0	0	0
Grinder Load in	0	0	1.801908	0	0	0	0	0	0	0	0	0	0	0
Dye Screen Load in	0	0	0	0.708448	0	0	0	0	0	0	0	0	0	0
Bagger Load in	0	0	0	0	1.628181	0	0	0	0	0	0	0	0	0
Storage pile load out	0	0	0	0	0	0.472698	0	0	0	0	0	0	0	0
Wood out	0	0	0	0	0	0	0.061874	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MHDR	0.04702	2.879302	1.801908	0.708448	1.628181	0.472698	0.061874	0	0	0	0	0	0	0

MHDR

PTE PM2.5 (lb/hr)	0.010493	0.28788	0.180159	0.070832	0.16279	0.047261	0.013808	0	0	0	0	0	0	0
PTE PM10 (lb/hr)	0.067453	1.850602	1.158133	0.455338	1.046474	0.303815	0.088763	0	0	0	0	0	0	0
PTE PM30 (lb/hr)	0.237208	6.507864	4.072713	1.601252	3.680053	1.068402	0.312147	0	0	0	0	0	0	0
PTE PM2.5 (lb/hr) w/ rain	0.00961	0.263647	0.164994	0.06487	0.149087	0.043283	0.012646	0	0	0	0	0	0	0
PTE PM10 (lb/hr) w/ rain	0.096098	2.636474	1.649943	0.648701	1.490867	0.432832	0.126457	0	0	0	0	0	0	0
PTE PM30 (lb/hr) w/ rain	0.33794	9.271477	5.802222	2.281235	5.242815	1.522107	0.444703	0	0	0	0	0	0	0
PTE PM2.5 (tons/yr)	0.04596	1.260913	0.789097	0.310246	0.713018	0.207005	0.060479	0	0	0	0	0	0	0
PTE PM10 (tons/yr)	0.295446	8.105636	5.072622	1.994382	4.583557	1.33071	0.388784	0	0	0	0	0	0	0
PTE PM30 (tons/yr)	1.03897	28.50444	17.83848	7.013482	16.11863	4.679602	1.367204	0	0	0	0	0	0	0
PTE PM2.5 (tons/yr) w/ rain	0.042091	1.154776	0.722675	0.284131	0.653	0.189581	0.055388	0	0	0	0	0	0	0
PTE PM10 (tons/yr) w/ rain	0.420909	11.54776	7.226749	2.841311	6.53	1.895806	0.553884	0	0	0	0	0	0	0
PTE PM30 (tons/yr) w/ rain	1.480177	40.60907	25.41373	9.99181	22.96353	6.666831	1.947798	0	0	0	0	0	0	0

PTE (lb/hr)

PTE (tons/yr)

	PM	PM10	PM2.5
Wood in	0.237208	0.067453	0.010493
Storage pile load in	6.507864	1.850602	0.28788
Grinder Load in	4.072713	1.158133	0.180159
Dye Screen Load in	1.601252	0.455338	0.070832
Bagger Load in	3.680053	1.046474	0.16279
Storage pile load out	1.068402	0.303815	0.047261
Wood out	0.312147	0.088763	0.013808
title	0	0	0
title	0	0	0
Sum PTE (lb/hr)	17.47964	4.970579	0.773223
Sum PTE (Tons/yr)	76.56082	21.77114	3.386718

Totals

Control Efficiency %

Haul Road BMP's	PM	PM10	PM2.5
Undocumented Watering	50	50	22.22

Missouri Department of dnr.mo.gov
NATURAL RESOURCES
Eric R. Greitens, Governor Carol S. Comer, Director

MAR 1 3 2018

Mr. Dale Eichmeyer
Engineer
Missouri Mulch
P.O. Box 104
Lebanon, MO 65536

RE: New Source Review Permit - Project Number: 2017-09-042

Dear Mr. Eichmeyer:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions 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, your new source review permit application and with your amended operating permit is necessary for continued compliance. 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.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: http://dnr.mo.gov/regions/. The online CAV request can be found at http://dnr.mo.gov/cav/compliance.htm.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty 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 administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact Sam Anzalone, at the Department of Natural Resources' 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:saj

Enclosures

c: St. Louis Regional Office
PAMS File: 2017-09-042

Permit Number: 032018-005