TECHNICAL SUPPORT DOCUMENT

Air Discharge Permit ADP 25-3689
Air Discharge Permit Application L-747

Issued: March 5, 2025

Willamette Valley Company, LLC

SWCAA ID - 659

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Southwest Clean Air Agency

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ABBREVIATIONS

List of Acronyms

ADP	Air Discharge Permit	NSPS	New Source Performance Standard
AP-42	Compilation of Emission Factors, AP-42, 5th Edition, Volume 1, Stationary Point and Area Sources – published by EPA	PSD	Prevention of Significant Deterioration
		RACT	Reasonably Available Control Technology
ASIL	Acceptable Source Impact Level	RCW	Revised Code of Washington
BACT	Best available control technology	SCC	Source Classification Code
CAM	Compliance Assurance Monitoring	SDS	Safety Data Sheet
CAS#	Chemical Abstracts Service registry number	SQER	Small Quantity Emission Rate listed in WAC 173-460
CFR	Code of Federal Regulations	Standard	Standard conditions at a temperature of 68°F (20°C) and a pressure of 29.92 in Hg (760 mm Hg)
EPA	U.S. Environmental Protection Agency	SWCAA	Southwest Clean Air Agency
EU	Emission Unit	WAC	Washington Administrative Code
mfr	Manufacturer		
NOV	Notice of Violation/		

List of Units and Measures

µg/m³	Micrograms per cubic meter	MMBtu	Million British thermal unit
µm	Micrometer (10^{-6} meter)	MMcf	Million cubic feet
acfm	Actual cubic foot per minute	ppm	Parts per million
bhp	Brake horsepower	ppmv	Parts per million by volume
dscfm	Dry Standard cubic foot per minute	ppmvd	Parts per million by volume, dry
gr/dscf	Grain per dry standard cubic foot	ppmw	Parts per million by weight
hp	Horsepower	scfm	Standard cubic foot per minute
hp-hr	Horsepower-hour	tph	Ton per hour
kW	Kilowatt	tpy	Tons per year

List of Chemical Symbols, Formulas, and Pollutants

CH_4	Methane	PM	Particulate Matter with an aerodynamic diameter 100 µm or less
CO	Carbon monoxide		
CO_2	Carbon dioxide	PM_{10}	PM with an aerodynamic diameter 10 µm or less
CO_2e	Carbon dioxide equivalent		
HAP	Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act	$PM_{2.5}$	PM with an aerodynamic diameter 2.5 µm or less
		SO_2	Sulfur dioxide
NO_2	Nitrogen dioxide	SO_x	Sulfur oxides
NO_x	Nitrogen oxides	TAP	Toxic air pollutant pursuant to Chapter 173-460 WAC
O_2	Oxygen		
O_3	Ozone	VOC	Volatile organic compound

Terms not otherwise defined have the meaning assigned to them in the referenced regulations or the dictionary definition, as appropriate.

1. FACILITY IDENTIFICATION

Applicant Name:	Willamette Valley Company, LLC
Applicant Address:	1830 Central Blvd, Centralia, WA 98531
Facility Name:	Willamette Valley Company, LLC
Facility Address:	1830 Central Blvd, Centralia, WA 98531
SWCAA Identification:	659
Contact Person:	Dan Smothers, Operations Manager
Primary Process:	Wood Flour Manufacturing
SIC/NAICS Code:	2499: Sawmills, General 321999: Other Miscellaneous Wood Product Manufacturing
Facility Classification:	Natural Minor

2. FACILITY DESCRIPTION

Willamette Valley Company, LLC (WVCO) operates a operates a wood flour production facility in Centralia, Washington. Wood flour is produced by drying and grinding green alder bark received from off-site sources. All wood flour produced at the facility is shipped off-site for use in other finished products. This facility previously operated under the name of Ace International, Inc.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit application number L-747 (ADP Application L-747) dated September 23, 2024. WVCO submitted ADP Application L-747 requesting approval of the following:

- Replacement of the Ratiomatic model 1250 RM natural gas heater with an OvenPak model EB6MRV natural gas heater. Operation of the new heater will be limited to the equivalent of full fire for 3,500 hours per year.

The current permitting action provides approval for the proposed replacement heater. ADP 25-3689 will supersede ADP 22-3537 in its entirety.

4. PROCESS DESCRIPTION

4.a. Raw Material Handling and Processing (*existing*). Willamette Valley purchases raw material (alder bark) in bulk from local lumber mills. Incoming raw material is reduced to a uniform size using a hog. The incoming material often contains wood chips in addition to bark, which cannot be used in Willamette's process because the physical characteristics of wood chip cellulose fibers prevents them from being made into flour. Willamette separates the wood chips using a rotary screen and sends the material offsite. Depending on the product specifications, the bark may need to be aged prior to being dried in the facility's drying unit.

To minimize the production of organic acids during the aging process, bark is maintained in an aerobic state (assumed if windrow O_2 concentration ≥10%). Willamette Valley has found that aerobic conditions are associated with bark temperatures of 170°F or less. Willamette Valley uses the following operating practices to ensure aerobic aging:

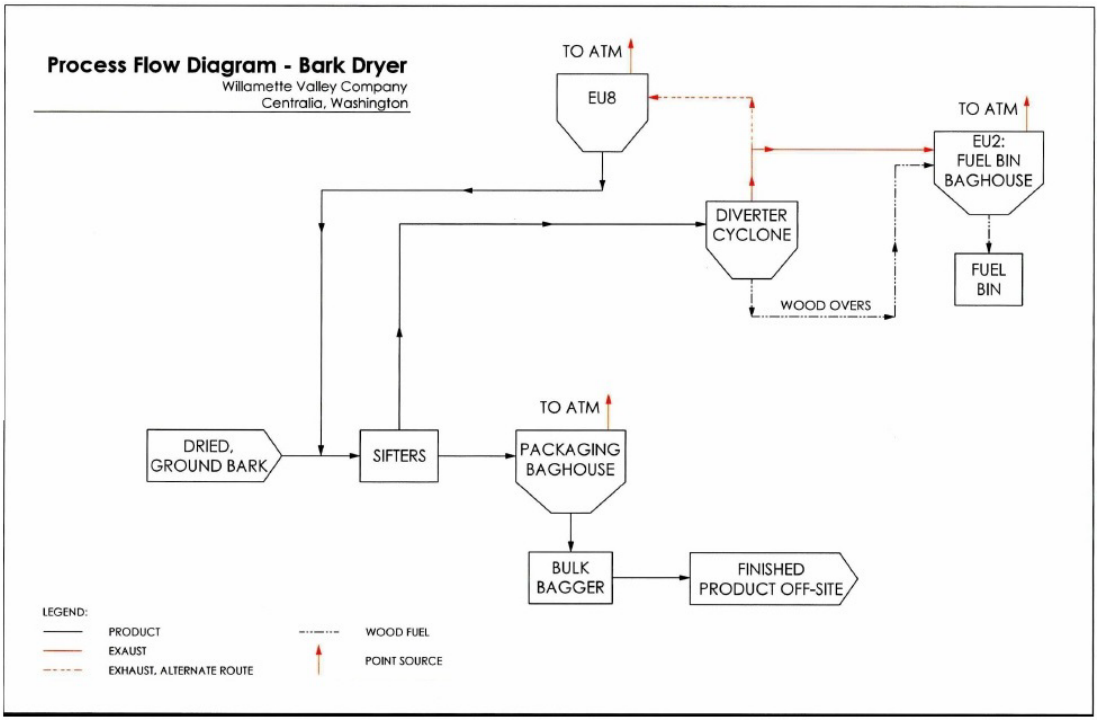
- Bark is laid out in windrows with an average height of no more than 11 feet.
- Bark temperature is monitored twice per week.
- Windrows are turned to reduce interior temperature if bark temperature exceeds 160°F.
- Windrows are turned at least once during the aging process.

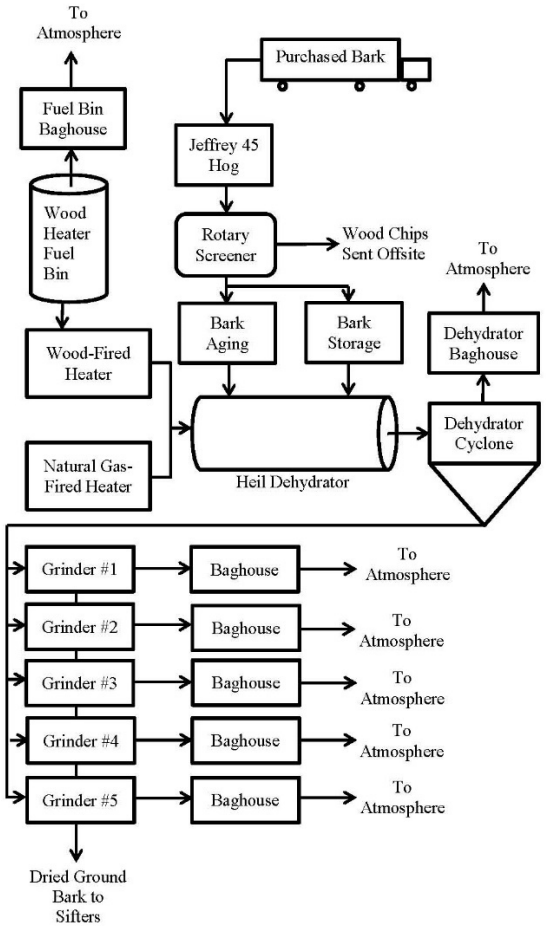
4.b. Bark Drying (*existing*). Aged and unaged bark is sent through a rotary drum dryer to reduce the material moisture content to approximately 10% at temperatures between 100°F and 175°F. Dried material is cooled as it exits the dryer, and then transferred pneumatically to the main plant for final grinding via a cyclone/baghouse combination. The rotary dryer is heated by one of two independent direct fired heaters (natural gas/wood). The natural gas and wood heaters cannot be fired at the same time.

4.c. Bark Grinding (*existing*). Material catch from the dryer cyclone/baghouse passes through a hammer mill, and is conveyed by bucket elevator to a main distribution bin. Material is fed from the distribution bin to one of five material grinders where the bark is reduced to a fine flour. Ground material is transferred by screw conveyor to two Prater screening units (sifters). Emissions from the sifters are controlled with process enclosure and fabric filtration (Blender Baghouse). Oversized material is pneumatically transferred from the sifters to the wood-out belt using a collection cyclone. The cyclone exhaust is vented to either the Fuel Bin Baghouse or Blender Baghouse (selectable). Finished flour is pneumatically transferred from the sifters to the packaging/bagging operation using a pneumatic conveyance system equipped with a dedicated baghouse (Packaging Baghouse).

4.d. Wood Flour Blending (*existing*). Finished flour and other components are placed into one of three bulk unloading units. Material is pneumatically transferred from the unloading units to an enclosed blender in the bark room. Fugitive dust emissions from the process are controlled with process enclosure and fabric filtration (Blender Baghouse). All equipment except the Blender Baghouse is located inside a building envelope.

4.e. Wood Flour Packaging (*existing*). Blended bulk product is pneumatically transferred from the blender to a bucket elevator, which feeds into a robotic packaging/bagging system manufactured by Conveying Industries, Inc. Filled bulk totes/bags are removed from the bagging unit with forklifts and stored in an adjacent warehouse. Fugitive dust emissions from the process are controlled with process enclosure and fabric filtration (Blender Baghouse). All equipment except the Blender Baghouse is located inside a building envelope.


Process Flow Diagram - Bark Dryer
Willamette Valley Company
Centralia, Washington
TO ATM
EU8
TO ATM
EU2:
FUEL BIN
BAGHOUSE
DIVERTER
CYCLONE
FUEL
BIN
WOOD OVERS
TO ATM
DRIED,
GROUND BARK
SIFTERS
PACKAGING
BAGHOUSE
BULK
BAGGER
FINISHED
PRODUCT OFF-SITE
LEGEND:
PRODUCT
EXAUST
EXHAUST, ALTERNATE ROUTE
WOOD FUEL
POINT SOURCE


To
Atmosphere
Purchased Bark
Fuel Bin
Baghouse
Jeffrey 45
Hog
Wood
Heater
Fuel
Bin
Rotary
Screener
Wood Chips
Sent Offsite
To
Atmosphere
Bark
Aging
Bark
Storage
Dehydrator
Baghouse
Wood-Fired
Heater
Dehydrator
Cyclone
Natural Gas-
Fired Heater
Heil Dehydrator
Grinder #1
Baghouse
To
Atmosphere
Grinder #2
Baghouse
To
Atmosphere
Grinder #3
Baghouse
To
Atmosphere
Grinder #4
Baghouse
To
Atmosphere
Grinder #5
Baghouse
To
Atmosphere
Dried Ground
Bark to
Sifters

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a. Bark Dehydrator (*modified*). One Baker Rullman model SD85-25 direct heat rotary drum dryer with a 3-pass configuration used to dry alder bark. Exhaust air and process material is transferred pneumatically from the dryer to a cyclone/baghouse combination.

Process heat for the dryer is provided by one of two heaters. Only one heater operates at a time. The heaters are identified as follows:

- Natural Gas Heater - One Eclipse Ratiomatic model 1250RM heater with a rated heat input of 12.5 MMBtu/hr.
- Wood Heater - One Energy Unlimited model EU10R15 heater with a rated heat input of 10.0 MMBtu/hr. Wood fuel for this unit includes a mixture of wood and bark.

Dehydrator Cyclone. One B&R Sheet Metal high efficiency cyclone with a diameter of 7'. The cyclone exhausts to the dehydrator baghouse.

Dehydrator Baghouse.

Mfg / Model:	Carothers model 270TR12HEI
Rated Airflow:	20,000 acfm
Filtration Area / Media:	5,130 ft^2 of 12 oz "Combo Felt" media. (270 filter bags)
Filter Cleaning:	Pulse jet
Exhaust Configuration:	24" dia vertical exhaust at ~30′ above ground level
Location:	46°44'12.42"N 122°56'43.95"W

ADP Application L-747. WVCO proposes to replace the existing Ratiomatic model 1250RM natural gas heater with a new OvenPak model EB6MRV burner. The new burner will be installed in the same configuration. The rated heat input of the new burner is larger than the existing burner (16.5 MMBtu/hr versus 12.5 MMBtu/hr). WVCO has taken a voluntary limit on burner operation equivalent to full fire for 3,500 hr/yr (~40% utilization rate). No changes will be made to the wood heater, dehydrator, or baghouse.

- *Natural Gas Heater - One OvenPak model EB6MRV heater with a rated heat input of 16.5 MMBtu/hr.*

5.b. Wood Heater Fuel Bin – Baghouse (*existing*). This baghouse controls fugitive emissions from wood heater fuel handling.

Mfg / Model:	Pulse Jet / RPJ24-8
Rated Airflow:	1,800 acfm
Filtration Area / Media:	307 ft^2 (24 filter bags) of 16 oz/yd^2 glazed polyester
Filter Cleaning:	Reverse pulse jet
Exhaust Configuration:	8" dia vertical exhaust at 25' above ground level
Location:	46°44'13.66"N 122°56'43.94"W

5.c. Bark Grinder #1 (*existing*). One 200 hp Pulvocron grinder used to pulverize dried bark. Emissions are controlled with process enclosure and a dedicated baghouse.

Baghouse Mfg / Model:	Flex Kleen / 84CT64
Rated Airflow:	3,000 acfm
Filtration Area / Media:	640 ft^2 (64 filter bags) of 16 oz/yd^2 polyester felt
Filter Cleaning:	Pulse jet
Exhaust Configuration:	10" dia horizontal exhaust at 48.5' above ground level
Location:	46°44'12.40"N 122°56'43.26"W

5.d. Bark Grinder #2 (*existing*). One 200 hp Pulvocron grinder used to pulverize dried bark. Emissions are controlled with process enclosure and a dedicated baghouse.

Baghouse Mfg / Model:	Flex Kleen / 84CT64
Rated Airflow:	3,000 acfm
Filtration Area / Media:	640 ft^2 (64 filter bags) of 16 oz/yd^2 polyester felt
Filter Cleaning:	Pulse jet
Exhaust Configuration:	10" dia horizontal exhaust at 48.5' above ground level
Location:	46°44'12.33"N 122°56'43.28"W

5.e. Bark Grinder #3 (*existing*). One 200 hp Pulvocron grinder used to pulverize dried bark. Emissions are controlled with process enclosure and a dedicated baghouse.

Baghouse Mfg / Model:	Flex Kleen model 84CT46
Rated Airflow:	2,500 acfm
Filtration Area / Media:	460 ft^2 (46 filter bags) of 16 oz/yd^2 polyester felt
Filter Cleaning:	Pulse jet
Exhaust Configuration:	8" dia horizontal exhaust at 48.5' above ground level
Location:	46°44'12.26"N 122°56'43.31"W

5.f. Bark Grinder #4 (*existing*). One 200 hp Pulvocron grinder used to pulverize dried bark. Emissions are controlled with process enclosure and a dedicated baghouse.

Baghouse Mfg / Model:	Flex Kleen model 84CT46
Rated Airflow:	2,500 acfm
Filtration Area / Media:	460 ft^2 (46 filter bags) of 16 oz/yd^2 polyester felt
Filter Cleaning:	Pulse jet
Exhaust Configuration:	8" dia horizontal exhaust at 48.5' above ground level
Location:	46°44'12.19"N 122°56'43.34"W

5.g. Bark Grinder #5 (*existing*). One 200 hp Pulvocron grinder used to pulverize dried bark. Emissions are controlled with process enclosure and a dedicated baghouse.

Baghouse Mfg / Model:	KICE model VR45-10N
Rated Airflow:	3,600 acfm
Filtration Area / Media:	530 ft^2 (45 filter bags) of 16 oz/yd^2 polyester felt
Filter Cleaning:	Pulse jet
Exhaust Configuration:	12" dia vertical exhaust at 10’8" above ground level
Location:	46°44'12.11"N 122°56'43.37"W

5.h. Flour Blender – Blender Baghouse (*existing*). One Munson Machinery model 700TH14OMS blender (s/n 130585) with a rated capacity of 6,000 lb/hr. The Munson blender receives unblended flour from three Carothers bulk unloaders. Blended flour is transferred to a Spiroflow model O22R bulk bag filler. The blender and the bulk unloaders are vented to a dedicated dust collector (Blender Baghouse). All process equipment is located inside a process building. Material catch from the Blender Baghouse is transferred back into the blending operation.

Blender Baghouse

Mfg / Model:	Grinding & Sizing, LLC / PO 49069 (s/n D032505E3052)
Rated Airflow:	3,000 acfm
Filtration Area / Media	~430 ft^2 (56 filter bags, 4.625" dia x 76" length) of 16 oz/yd^2 polyester felt
Filter Cleaning:	Pulse jet
Exhaust Configuration:	10" dia vertical exhaust at 20' above ground level
Location:	46°44'11.98"N 122°56'41.98"W

5.i. Flour Transfer System – Packaging Baghouse (*existing*). This unit pneumatically transfers finished flour from the sifters to the packaging operation using a dedicated dust collector (Packaging Baghouse).

Packaging Baghouse

Mfg / Model:	Carothers and Sons / CSL 9BR5RC
Rated Airflow:	400 acfm
Filtration Area / Media:	~70 ft^2 (9 filter bags) of 16 oz/yd^2 polyester
Filter Cleaning:	Pulse jet
Exhaust Configuration:	3" dia vertical exhaust at 25' above ground level
Location:	46°44'12.02"N 122°56'42.27"W

5.j. Equipment/Activity Summary.

ID No.	Equipment/Activity	Control Equipment/Measure
1	Bark Dehydrator (Natural Gas – 16.5 MMBtu/hr) (Wood – 10.0 MMBtu/hr)	Process Enclosure Cyclone (B&R Sheet Metal – 7' dia) Baghouse (Carothers – 20,000 acfm)
2	Wood Heater Fuel Bin	Process Enclosure, Baghouse (Pulse Jet Filter – 1,800 acfm)
3	Bark Grinder #1 (Pulvocron – 200 hp)	Process Enclosure, Baghouse (Flex Kleen – 3,000 acfm)
4	Bark Grinder #2 (Pulvocron – 200 hp)	Process Enclosure, Baghouse (Flex Kleen – 3,000 acfm)
5	Bark Grinder #3 (Pulvocron – 200 hp)	Process Enclosure, Baghouse (Flex Kleen – 2,500 acfm)
6	Bark Grinder #4 (Pulvocron – 200 hp)	Process Enclosure, Baghouse (Flex Kleen – 2,500 acfm)
7	Bark Grinder #5 (Pulvocron – 200 hp)	Process Enclosure, Baghouse (KICE – 3,600 acfm)
8	Flour Blender (Munson Machinery)	Process Enclosure, Baghouse (Grinding & Sizing – 3,000 acfm)
9	Flour Transfer System	Process Enclosure, Baghouse (Carothers and Sons – 400 acfm)
10	Bark Aging and Storage	Aerobic Processing

6. EMISSIONS DETERMINATION

Emissions to the ambient atmosphere from facility operations proposed in ADP Application L-747 consist of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM), sulfur dioxide (SO_2), toxic air pollutants (TAPs), and hazardous air pollutants (HAPs).

Unless otherwise specified by SWCAA, actual emissions must be determined using the specified input parameter listed for each emission unit and the following hierarchy of methodologies:

(a) Continuous emissions monitoring system (CEMS) data;
(b) Source emissions test data (EPA reference method). When source emissions test data conflicts with CEMS data for the time period of a source test, source test data must be used;
(c) Source emissions test data (other test method); and
(d) Emission factors or methodology provided in this TSD.

6.a. Bark Dehydrator (*modified*). Potential emissions from dehydrator operation while firing natural gas are calculated from maximum rated heat input (16.5 MMBtu/hr), 57,816 MMBtu/yr of fuel consumption (40% utilization), a maximum discharge rate of 20,000 dscfm, and applicable emission factors. Potential emissions from dehydrator operation while firing wood are calculated from maximum rated heat input (10.0 MMBtu/hr), 8,760 hr/yr of operation, a maximum discharge rate of 20,000 dscfm, and applicable emission factors. The dehydrator operates on only one heater at any given time. Emission limits for the dehydrator have been established based on the most emissive operating scenario, which is full time operation of the wood fired heater.

ADP Application L-747. WVCO is proposing to replace the existing natural gas heater with a new natural gas heater of similar configuration. WVCO has proposed a voluntary limit on burner operation equivalent to full fire for 3,500 hr/yr (~40% utilization rate). WVCO has not proposed to make any changes to the configuration or capacity of the bark dryer or the wood fired heater.

Criteria Pollutant Emissions. Emission factors for operation while firing natural gas are taken from EPA AP-42, Section 1.4 "Natural Gas Combustion" (7/98) [VOC, SO_2], BACT limits [NO_X, CO, filterable PM/PM_{10}], EPA PM Calculator Version 2.0 [filterable $PM_{2.5}$], and test results [condensable PM].

Emission factors for operation while firing wood are taken from BACT limits [NO_X, CO, filterable PM/PM_{10}], EPA PM Calculator Version 2.0 [filterable $PM_{2.5}$], emission test data dated 11/24/09 [condensable PM], and EPA AP-42 Section 1.6 "Wood Residue Combustion in Boilers" (7/03) [VOC, SO_2].

Toxic/Hazardous Air Pollutant Emissions from Combustion. TAP/HAP emission factors for the natural gas burner are taken from EPA AP-42, Section 1.4 "Natural Gas Combustion" (7/98). TAP/HAP emission factors for the wood burner are taken from EPA AP-42 Section 1.6 "Wood Residue Combustion in Boilers" (7/03). HAP and TAP compounds with an emission factor rating of "D" or less were not included due to the questionable applicability of the emissions data. A control efficiency of 80% has been applied to solid phase emission factors to reflect the use of fabric filtration.

Emissions from Bark Dehydration. Potential TAP/HAP emissions were determined from the results of EPA Method 320 FTIR testing conducted in 2020. For all compounds other than acetic acid, the potential emissions were calculated by adding the average to two standard deviations of the results from the three test runs in 2020. The FTIR testing in 2018, 2019, and 2020 indicated that acetic acid makes up the majority of the organic acids and acetic acid emissions can be calculated relatively accurately from the pH of the incoming bark. Since the permit includes a minimum pH limit (4.0), potential acetic acid emissions were matched to this value. It is believed that the compounds identified in the FTIR testing comprise the majority of the VOC emissions, so total VOC emissions were calculated as the sum of all of the potential emissions of each identified species. Because not all species will be emitted at their highest potential at any one time, this is a conservative estimate, but can also account for the possibility that there are unidentified compounds that would add significantly to the total VOC value if known.

Heil Dehydrator - Natural Gas Fired

Heat Rate =	16.5	MMBtu/hr
Natural Gas Heat Value =	1,020	Btu/scf for AP-42 emission factors
Natural Gas Heat Value =	1,026	Btu/scf for 40 CFR 98 GHG emission factors
Fuel Consumption =	57,750	MMBtu/yr
Number of Hours Operated =	3,500	hours per year
Exhaust Flow Rate =	20,000	dscfm
Fuel Factor =	9,600	dscf/MMBtu
Maximum Wood Drying Rate =	3.25	tons per hour

Pollutant	ppmvd @ 18% O_2	Emission Factor lb/MMBtu	Emissions lb/hr	Emissions tpy	Emission Factor Source
NO_X	24	0.1821	3.005	5.26	BACT
CO	81	0.3693	6.093	10.66	BACT
SO_X as SO_2		0.00059	0.010	0.017	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	3.397E-05	0.000059	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.0012132	0.0021	AP-42 Sec. 1.4 (7/98)

Pollutant	Emission Factor lb/ton prod.	Emission Factor lb/hr	Emissions lb/hr	Emissions tpy	Emission Factor Source
Filterable PM/PM_{10}		0.86	0.86	1.50	0.005 gr/dscf limit
Filterable $PM_{2.5}$		0.71	0.71	1.25	83% of filterable PM
Condensible PM	0.365		1.18	2.07	11/24/09 Emission Test
Total PM		0.86	2.04	3.57	Filterable + Condensible
PM_{10}		0.86	2.04	3.57	Filterable + Condensible
$PM_{2.5}$		0.71	1.90	3.32	Filterable + Condensible

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	Emission Factor Source
CO_2	53.06	1	116.98	120,019	3,377.7	40 CFR 98
CH_4	0.001	25	0.055	56.55	1.6	40 CFR 98
N_2O	0.0001	298	0.066	67.41	1.9	40 CFR 98
Total GHG - CO_2e			117.098	120,143	3,381.2	

Heil Dehydrator - Wood Fired

Heat Rate =	10.0	MMBtu/hr
Fuel Consumption =	87,600	MMBtu/yr
Exhaust Flow Rate =	20,000	dscfm
Fuel Factor =	9,600	dscf/MMBtu
Number of Hours Operated =	8,760	hours per year
Exhaust Flow Rate =	20,000	dscfm
Fuel Factor =	9,600	dscf/MMBtu
Maximum Wood Drying Rate =	3.25	tons per hour

	ppmvd	Emission Factor		Emissions		
Pollutant	@ 18% O_2	lb/MMBtu	lb/hr	lb/hr	tpy	Emission Factor Source
NO_X	59	0.4900		4.900	21.46	BACT
CO	50	0.2500		2.500	10.95	BACT
SO_X as SO_2		0.02500		0.25000	1.10	AP-42 Table 1.6-2 (7/03)

	Emission Factor		Emissions		
Pollutant	lb/ton prod.	lb/hr	lb/hr	tpy	Emission Factor Source
Filterable PM/PM_{10}		1.71	1.71	7.51	0.010 gr/dscf limit
Filterable $PM_{2.5}$		1.42	1.42	6.23	83% of filterable PM
Condensible PM	0.365		1.18	5.19	11/24/09 Emission Test
Total PM		1.71	2.90	12.70	Filterable + Condensible
PM_{10}		1.71	2.90	12.70	Filterable + Condensible
$PM_{2.5}$		1.42	2.61	11.42	Filterable + Condensible

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	tpy, CO_2e	Emission Factor Source
CO_2	93.80	1	206.79	9,057.6	40 CFR 98
CH_4	0.0072	25	0.397	17.4	40 CFR 98
N_2O	0.0036	298	2.365	103.6	40 CFR 98
Total GHG - CO_2e			209.556	9,178.5	

Heil Dehydrator - Wood Fired Heater - Toxic Air Pollutant Emissions

Heat Rate = 10.0 MMBtu/hr
Fuel Consumption = 87,600 MMBtu/yr
Solid Phase Control Efficiency = 80%

Pollutant	HAP?	Uncontrolled Emission Factor lb/MMBtu	Controlled Emission Factor lb/MMBtu	Emissions lb/hr	Emissions lb/yr	HAP Subtotal lb/yr
2,4,6-Trichlorophenol	Yes	2.20E-08	2.20E-08	2.20E-07	1.93E-03	1.93E-03
2-Chlorophenol		2.40E-08	2.40E-08	2.40E-07	2.10E-03	
Acetaldehyde	Yes	8.30E-04	8.30E-04	8.30E-03	7.27E+01	7.27E+01
Acrolein	Yes	2.02E-05	2.02E-05	2.02E-04	1.77E+00	1.77E+00
Antimony	Yes	7.90E-06	1.58E-06	1.58E-05	1.38E-01	1.38E-01
Arsenic	Yes	2.20E-05	4.40E-06	4.40E-05	3.85E-01	3.85E-01
Barium		1.70E-04	3.40E-05	3.40E-04	2.98E+00	
Benzene	Yes	4.20E-03	4.20E-03	4.20E-02	3.68E+02	3.68E+02
Beryllium	Yes	1.10E-06	2.20E-07	2.20E-06	1.93E-02	1.93E-02
Cadmium	Yes	4.10E-06	8.20E-07	8.20E-06	7.18E-02	7.18E-02
Chromium (hex)	Yes	3.50E-06	7.00E-07	7.00E-06	6.13E-02	6.13E-02
Chromium (total)	Yes	2.10E-05	4.20E-06	4.20E-05	3.68E-01	3.68E-01
Cobalt	Yes	6.50E-06	1.30E-06	1.30E-05	1.14E-01	1.14E-01
Copper		4.90E-05	9.80E-06	9.80E-05	8.58E-01	
Fluorene	Yes	3.40E-06	3.40E-06	3.40E-05	2.98E-01	2.98E-01
Formaldehyde	Yes	1.17E-03	1.17E-03	1.17E-02	1.02E+02	1.02E+02
Hydrogen chloride	Yes	1.90E-02	1.90E-02	1.90E-01	1.66E+03	1.66E+03
Iron (as oxide fume)		9.90E-04	1.98E-04	1.98E-03	1.73E+01	
Lead	Yes	4.80E-05	9.60E-06	9.60E-05	8.41E-01	8.41E-01
Manganese	Yes	1.60E-03	3.20E-04	3.20E-03	2.80E+01	2.80E+01
Mercury	Yes	3.50E-06	3.50E-06	3.50E-05	3.07E-01	3.07E-01
Naphthalene	Yes	9.70E-05	9.70E-05	9.70E-04	8.50E+00	8.50E+00
Nickel	Yes	3.30E-05	6.60E-06	6.60E-05	5.78E-01	5.78E-01
Phenol	Yes	5.10E-05	5.10E-05	5.10E-04	4.47E+00	4.47E+00
Selenium	Yes	2.80E-06	5.60E-07	5.60E-06	4.91E-02	4.91E-02
Toluene	Yes	9.20E-04	9.20E-04	9.20E-03	8.06E+01	8.06E+01
Zinc (as oxide fume)		4.20E-04	8.40E-05	8.40E-04	7.36E+00	
PCBs (total)	Yes	7.93E-09	7.93E-09	7.93E-08	6.94E-04	6.94E-04
PAHs (total-equiv)	Yes	3.19E-06	3.19E-06	3.19E-05	2.80E-01	2.80E-01
2,3,7,8-TCDD (equiv)	Yes	6.54E-10	6.54E-10	6.54E-09	5.73E-05	5.73E-05
				Totals =	2,363	2,334

Emission Factor Source: AP-42 Tables 1.6-3 and 1.6-4 (7/03)

Bark Drying - Aged Bark

	Throughput
Aged Bark Processed =	28,470 tons per year
Maximum Bark Production Rate =	3.25 tons per hour

Pollutant	CAS	HAP?	Aged Bark lb/ton product	Aged Bark lb/hr	Aged Bark tpy
Formaldehyde	50-00-0	Yes	0.0042	0.014	0.060
Acetaldehyde	75-07-0	Yes	0.027	0.086	0.38
Propanal	123-38-6	Yes	0.053	0.17	0.75
Methanol	67-56-1	Yes	0.32	1.05	4.61
Acetic Acid	64-19-7	No	2.17	7.06	30.91
Acrolein	107-02-8	Yes	0.0053	0.017	0.076
Formic Acid	64-18-6	No	0.29	0.95	4.17
Propionic Acid	79-09-4	No	0.053	0.17	0.76
VOC			2.93	9.52	41.71

Potential emissions from aged bark are believed to be as high, or higher than, potential emissions from unaged bark. Separate emission factors may be available in the future for unaged bark and used to calculate annual emissions.

6.b. Material Handling Baghouses (*existing*). Potential emissions from material handling baghouses are calculated based on each unit's rated flowrate, 8,760 hr/yr of operation and a maximum emission concentration of 0.005 gr/dscf. All emissions are assumed to be PM_{10}. $PM_{2.5}$ emissions are assumed to be 53% of PM_{10} emissions (EPA PM Calculator Version 2.0 / SCC-30703099).

Material Handling Baghouses ($PM_{10}/PM_{2.5}$ Emissions)

	Rated flow (cfm)	Hours of Op.	Emissions PM/PM_{10} gr/dscf	$PM_{2.5}$ gr/dscf	PM/PM_{10} lb/hr	PM/PM_{10} tpy	$PM_{2.5}$ lb/hr	$PM_{2.5}$ tpy
Wood Heater Fuel Bir	1,800	8,760	0.005	0.00265	0.08	0.34	0.04	0.18
Bark Grinder #1	3,000	8,760	0.005	0.00265	0.13	0.56	0.07	0.30
Bark Grinder #2	3,000	8,760	0.005	0.00265	0.13	0.56	0.07	0.30
Bark Grinder #3	2,500	8,760	0.005	0.00265	0.11	0.47	0.06	0.25
Bark Grinder #4	2,500	8,760	0.005	0.00265	0.11	0.47	0.06	0.25
Bark Grinder #5	3,600	8,760	0.005	0.00265	0.15	0.68	0.08	0.36
Flour Blender	3,000	8,760	0.005	0.00265	0.13	0.56	0.07	0.30
Flour Transfer System	400	8,760	0.005	0.00265	0.02	0.08	0.01	0.04
Totals					0.85	3.72	0.45	1.97

6.c. Bark Aging and Storage (*existing*). Bark, wood, and other biomass will decompose during storage. Willamette Valley manages this process in their aged product to ensure specific product attributes. Literature indicates that dry matter losses from storage, aging, or composting, can range from several percent in relatively dry material with little microbial activity, to around 50% in the active composting over a time period of several months. Most of the carbon is lost as CO_2, but CH_4 and a range of VOCs, including turpenes and organic acids would also be expected. The amount of each species would be highly dependent on the material and conditions of storage, aging, or composting. SWCAA is not aware of any data that currently could be used to estimate these emissions for Willamette Valley's storage and aging piles. Willamette Valley's proposed practice of storing and aging bark piles in an aerobic manner is expected to reduce emissions relative to the default practice of piling bark in the most space-efficient way possible.

6.d. Emissions Summary/Facility-wide Potential to Emit. Facility-wide potential to emit as calculated in the sections above is summarized below.

Pollutant	Potential Emissions (tpy)	Project Increase (tpy)
NO_X	21.46	0.00
CO	10.95	0.00
VOC	41.71	0.00
SO_2	1.10	0.00
PM	16.41	0.00
PM_{10}	16.41	0.00
$PM_{2.5}$	13.39	0.00
TAP	42.90	0.00
HAP	7.05	0.00
CO_2e	9,179	0.00

TAP Summary Pollutant	CAS #	Category	Facilitywide Potential to Emit lb/yr	Project Impact lb/yr
2,4,6-Trichlorophenol	88-06-2	HAP/TAP A	0.0019	0
2-Chlorophenol	108-43-0	TAP A	0.0021	0
Acetaldehyde	75-07-0	HAP/TAP A	829	0
Acetic Acid	64-19-7	TAP B	61,820	0
Acrolein	107-02-8	HAP/TAP B	153	0
Antimony	7440-36-0	HAP/TAP B	0.14	0
Arsenic	7440-38-2	HAP/TAP A	0.39	0
Barium	7440-39-3	TAP B	3.0	0
Benzene	71-43-2	HAP/TAP A	368	0
Beryllium	7440-41-7	HAP/TAP A	0.02	0
Cadmium	7440-43-9	HAP/TAP A	0.07	0
Chromium (hex)	7440-47-3	HAP/TAP A	0.06	0
Chromium (total)	-	HAP/TAP B	0.37	0
Cobalt	7440-48-4	HAP/TAP B	0.11	0
Copper	7440-50-8	TAP B	0.86	0
Fluorene	86-73-7	HAP/TAP B	0.30	0
Formaldehyde	50-00-0	HAP/TAP A	222	0
Formic Acid	64-18-6	TAP B	8,335	0
Hydrogen chloride	7647-01-0	HAP/TAP B	1,664	0
Iron (as oxide fume)	1309-37-1	TAP B	17.3	0
Lead	7439-92-1	HAP/TAP A	0.84	0
Manganese	7439-96-5	HAP/TAP B	28	0
Mercury	7439-97-6	HAP/TAP B	0.31	0
Methanol	67-56-1	HAP/TAP B	9,227	0
Naphthalene	91-20-3	HAP/TAP B	8.50	0
Nickel	2/2/7440	HAP/TAP A	0.58	0
Phenol	108-95-2	HAP/TAP B	4.47	0
Propionaldehyde	123-38-6	HAP/TAP B	1,505	0
Propionic Acid	79-09-4	TAP B	1,512	0
Selenium	7782-49-2	HAP/TAP B	0.05	0
Toluene	108-88-3	HAP/TAP B	80.6	0
Zinc (as oxide fume)	1314-13-2	TAP B	7.4	0
PCBs (total)	1336-36-3	HAP/TAP A	0.00069	0
PAHs (total-equiv)	-	HAP/TAP A	0.28	0
2,3,7,8-TCDD (equiv)	-	HAP/TAP A	0.000057	0

7. REGULATIONS AND EMISSION STANDARDS

Regulations that have been used to evaluate the acceptability of the proposed facility and establish emission limits and control requirements include, but are not limited to, the regulations, codes, or requirements listed below.

7.a. Revised Code of Washington (RCW) 70A.15.2040 empowers any activated air pollution control authority to prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution within its jurisdiction. An air pollution control authority may issue such orders as may be necessary to effectuate the purposes of the Washington Clean Air Act [RCW 70A.15A] and enforce the same by all appropriate administrative and judicial proceedings subject to the rights of appeal as provided in Chapter 62, Laws of 1970 ex. sess.

7.b. RCW 70A.15.2210 provides for the inclusion of conditions of operation as are reasonably necessary to assure the maintenance of compliance with the applicable ordinances, resolutions, rules and regulations when issuing an Order of Approval (Air Discharge Permit) for installation and establishment of an air contaminant source.

7.c. Washington Administrative Code (WAC) 173-460 "Controls for New Sources of Toxic Air Pollutants" requires Best Available Control Technology for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.

7.d. WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM_{10}, $PM_{2.5}$, lead, sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide in the ambient air, which shall not be exceeded.

7.e. SWCAA 400-040 "General Standards for Maximum Emissions" requires all new and existing sources and emission units to meet certain performance standards with respect to Reasonably Available Control Technology (RACT), visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, sulfur dioxide, concealment and masking, and fugitive dust.

7.f. SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person shall cause or permit the emission of particulate matter from any combustion or incineration unit in excess of 0.23 grams per dry cubic meter (0.1 grains per dry standard cubic foot) of exhaust gas at standard conditions.

7.g. SWCAA 400-060 "Emission Standards for General Process Units" prohibits particulate matter emissions from all new and existing process units in excess of 0.1 grains per dry standard cubic foot of exhaust gas.

7.h. SWCAA 400-091 "Voluntary Limits on Emissions" allows sources to request voluntary limits on emissions and potential to emit by submittal of an ADP application as provided in SWCAA 400-109. Upon completion of review of the application, SWCAA shall issue a Regulatory Order that reduces the source's potential to emit to an amount agreed upon between SWCAA and the permittee.

7.i. SWCAA 400-109 "Air Discharge Permit Applications" requires that an Air Discharge Permit application be submitted for all new installations, modifications, changes, or alterations to process and emission control equipment consistent with the definition of "new source". Sources wishing to modify existing permit terms may submit an Air Discharge Permit application to request such changes. An Air Discharge Permit must be issued, or written confirmation of exempt status must be received, before beginning any actual construction, or implementing any other modification, change, or alteration of existing equipment, processes, or permits.

7.j. SWCAA 400-110 "New Source Review" requires that SWCAA issue an Air Discharge Permit in response to an Air Discharge Permit application prior to establishment of the new source, emission unit, or modification.

7.k. SWCAA 400-113 "Requirements for New Sources in Attainment or Nonclassifiable Areas" requires that no approval to construct or alter an air contaminant source shall be granted unless it is evidenced that:

(1) The equipment or technology is designed and will be installed to operate without causing a violation of the applicable emission standards;
(2) Best Available Control Technology will be employed for all air contaminants to be emitted by the proposed equipment;
(3) The proposed equipment will not cause any ambient air quality standard to be exceeded; and
(4) If the proposed equipment or facility will emit any toxic air pollutant regulated under WAC 173-460, the proposed equipment and control measures will meet all the requirements of that Chapter.

8. RACT/BACT/BART/LAER/PSD/CAM DETERMINATIONS

The proposed equipment and control systems incorporate Best Available Control Technology (BACT) for the types and amounts of air contaminants emitted by the processes as described below:

New BACT Determinations

8.a. BACT Determination – Bark Dehydrator Natural Gas Heater. The use of low sulfur fuel (natural gas), proper combustion controls, and annual emission monitoring has been determined to meet the requirements of BACT for natural gas fired bark dehydrator heaters at this facility.

Previous BACT Determinations

8.b. BACT Determination – Bark Storage and Aging (*ADP 21-3459*). The proposed use of work and management practices to maintain material in an aerobic state has been determined to meet the requirements of BACT for emissions from bark storage and aging operations.

8.c. BACT Determination – Pneumatic Material Handling Systems (*ADP 20-3438*). The proposed use of process enclosure, high efficiency filtration and vertical dispersion of exhaust streams has been determined to meet the requirements of BACT for emissions from pneumatic material handling systems at this facility.

8.d. BACT Determination – Bulk Packaging Systems (*ADP 20-3438*). The proposed use of process enclosure, high efficiency filtration and vertical dispersion of exhaust streams has been determined to meet the requirements of BACT for emissions from bulk packaging systems at this facility.

Other Determinations

8.e. Prevention of Significant Deterioration (PSD) Applicability Determination. The potential to emit of this facility is less than applicable PSD applicability thresholds. Likewise, this permitting action will not result in a potential increase in emissions equal to or greater than the PSD thresholds. Therefore, PSD review is not applicable to this action.

8.f. Compliance Assurance Monitoring (CAM) Applicability Determination. CAM is not applicable to any emission unit at this facility because it is not a major source and is not required to obtain a Part 70 permit.

9. AMBIENT IMPACT ANALYSIS

9.a. TAP Small Quantity Review. The incremental increases in TAP emissions associated with this permitting action are quantified in Section 6 of this Technical Support Document. All incremental increases in individual TAP emissions are less than the applicable small quantity emission rate (SQER) identified in WAC 173-460.

Conclusions

9.b. Installation of a replacement natural gas heater, as proposed in ADP Application L-747, will not cause the ambient air quality requirements of Title 40 Code of Federal Regulations (CFR) Part 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.

9.c. Installation of a replacement natural gas heater, as proposed in ADP Application L-747, will not cause the requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" or WAC 173-476 "Ambient Air Quality Standards" to be violated.

9.d. Installation of a replacement natural gas heater, as proposed in ADP Application L-747, will not cause a violation of emission standards for sources as established under SWCAA General Regulations Sections 400-040 "General Standards for Maximum Emissions," 400-050 "Emission Standards for Combustion and Incineration Units," and 400-060 "Emission Standards for General Process Units."

10. DISCUSSION OF APPROVAL CONDITIONS

SWCAA has made a determination to issue ADP 25-3689 in response to ADP Application L-747. ADP 25-3689 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

10.a. Supersession of Previous Permits. ADP 25-3689 supersedes ADP 22-3537 in its entirety.

10.b. General Basis. Permit requirements for equipment affected by this permitting action incorporate the operating schemes proposed by the applicant in ADP Application L-747. Permit requirements established by this action are intended to implement BACT, minimize emissions, and assure compliance with applicable requirements on a continuous basis.

10.c. Monitoring and Recordkeeping Requirements. The Permit establishes monitoring and recordkeeping requirements sufficient to document compliance with applicable emission limits, ensure proper operation of approved equipment and provide for compliance with generally applicable requirements. Specific requirements are established for baghouse differential pressure, combustion zone temperature, hours of operation, and dehydrator fuel consumption.

Microbial activity in the bark piles and windrows is much lower than in a composting materials, so oxygen levels are expected to change relatively slowly, and oxygen monitoring is only required weekly.

Bark pH monitoring is required weekly to assure that the aerobic processing and 6 week storage limitation is adequately controlling organic acid concentrations in the bark. Because bark pH correlates very well with organic acid emissions during drying, bark that has been stored for more than 6 weeks or not met the aerobic aging criteria can be processed if the pH is monitored hourly to assure compliance with the pH limitation.

10.d. Reporting Requirements. The Permit requires reporting of the annual air emissions inventory, and reporting of the data necessary to develop the inventory. Excess emissions must be reported as soon as possible in order to qualify for relief from monetary penalty in accordance with SWCAA 400-107. In addition, deviations from permit conditions must be reported within 30 days of discovery in accordance with the SWCAA 400-107 requirement for excess emissions.

10.e. Emission Limits.

Bark Grinding/Flour Handling. Bark grinding and flour handling operations use a combination of process enclosure and fabric filtration to control fugitive dust emissions associated with grinding and handling activities. Visible emissions from the grinders and grinder baghouse exhausts are expected to be 0%.

Wood Flour Sifting/Blending/Packaging. Wood flour sifting, blending and packaging operations use a combination of process enclosure and negative ventilation to control fugitive dust emissions associated with sifting, blending, and packaging activities. Primary process equipment is located inside a building envelope so fugitive emissions are expected to be negligible. The Blender Baghouse is the only unit with ambient exhaust and is regulated as an emission unit. Visible emissions from the building envelope and the Blender Baghouse exhaust are expected to be 0%.

Bark Drying. Emissions of VOCs, HAPs, and TAPs were first addressed in ADP 21-3459. BACT was determined to be aerobic storage and aging of bark to minimize generation of organic acids. Emission limits for VOCs and each HAP/TAP species were based on EPA Method 320 tests of aerobically aged bark conducted August 21, 2020. With the exception of the emission limits for acetic acid, the individual emission limits were calculated as follows:

$$\text{Emission Limit } \left(\frac{\text{lb}}{\text{hr}}\right) =$$

$$\left(3 \text{ Run Average } \left(\frac{\text{lb}}{\text{ton product}}\right) + 2 * \text{Standard Deviation} \left(\frac{\text{lb}}{\text{ton product}}\right)\right) * \left(\frac{3.25 \text{ tons product}}{\text{hour}}\right)$$

Where 3.25 tons of product per hour is the estimated maximum production rate.

For acetic acid, the second order curve fit to the 9 available tests from 2019 and 2020 predicted a slightly higher emission rate (7.06 lb/hr) at the proposed minimum pH of 4.0 than the above method, so this higher level was established as a permit limit and used for the dispersion modeling analysis.

10.f. Operating Limits and Requirements.

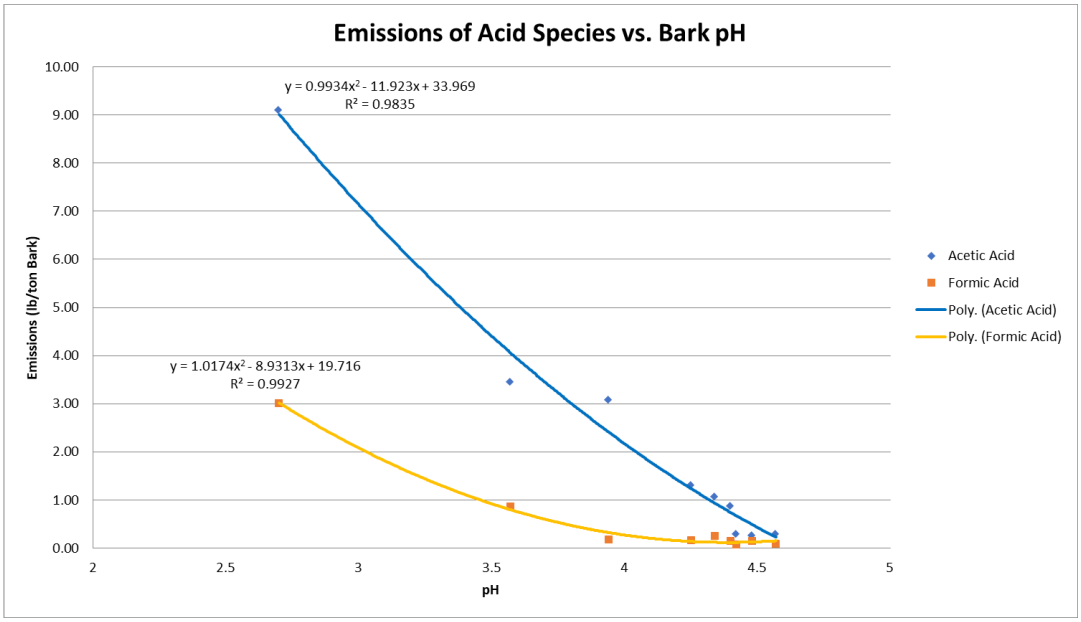
Minimum Bark pH. The primary source of VOC emissions, and the toxic air pollutant emissions that comprise the VOC emissions, during drying is from organic acids generated during bark decomposition during storage and aging. The pH measurements of the bark prior to drying have correlated very well with the organic acid emissions measured during testing. A minimum pH of 4.0 was chosen because:

(1) The available test data for aerobically aged bark and unaged bark indicated this limit can be achieved in practice either by aerobic aging or by limiting the storage time to 6 weeks or less;

(2) Based on the available data, this level is a good balance between a level that is achievable with reasonable control measures and a level that serves as an effective limit on potential emissions with a reasonable margin of compliance; and

(3) A second order best-fit plot of bark pH vs. acetic acid and formic acid emissions for the 9 available test runs from testing conducted in 2019 and 2020 indicate that emissions of acetic acid could cause an exceedance of the ASIL at a pH below 3.8.

pH is on a base 10 logarithmic scale, so the "average" of a pH of 3.5, 4.0, and 4.5 is actually 3.83 (not 4.0), but it is not practical to ask operators to perform logarithmic calculations to average the hydrogen ion concentration and then convert that to a pH. This limit applies on a 1-hour average basis, so it is appropriate for the limit to be somewhat higher than the level needed to comply with the relevant ASILs, especially when using arithmetic averaging (not accounting for the logarithmic nature of pH).



Plot of Individual Test Results from 2018 – 2020

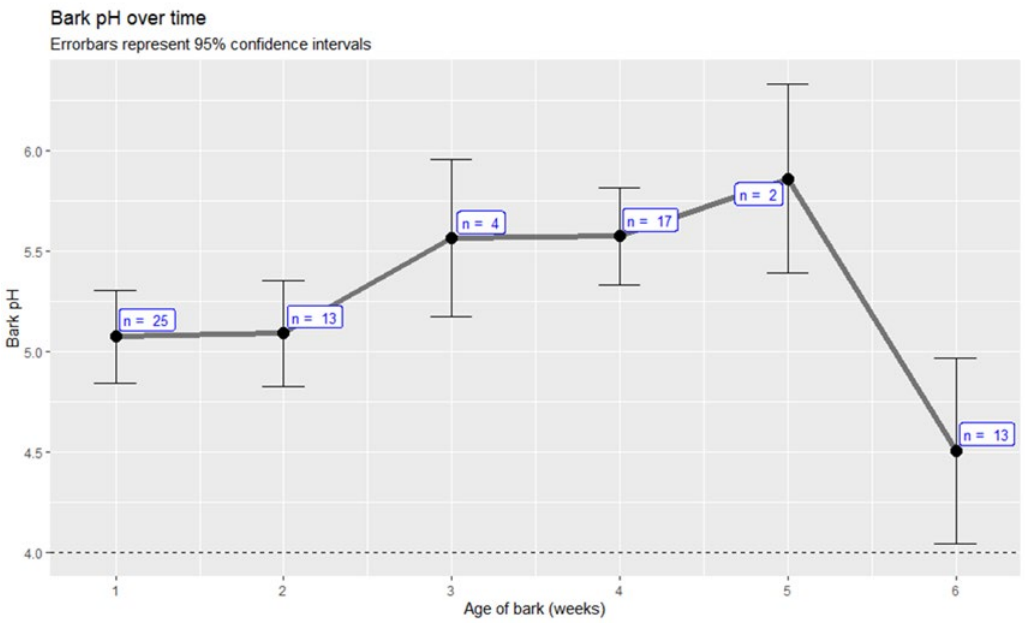


Chart Provided by Willamette Valley 12/18/2020

In lieu of monitoring oxygen and moisture content to assure aerobic conditions within the pile (as might be standard practice for a composting facility), the applicant proposed, and SWCAA concurred, that the following combination of windrow management measures would provide a reasonable assurance of aerobic conditions within the pile:

(1) A maximum windrow height of 11 feet;
(2) Turning the windrow at least once during the aging process; and
(3) Taking corrective action whenever the interior windrow temperature exceeds 160°F.

The applicant supplied test data indicating that windrows were sufficiently aerobic when processed in accordance with the above measures:

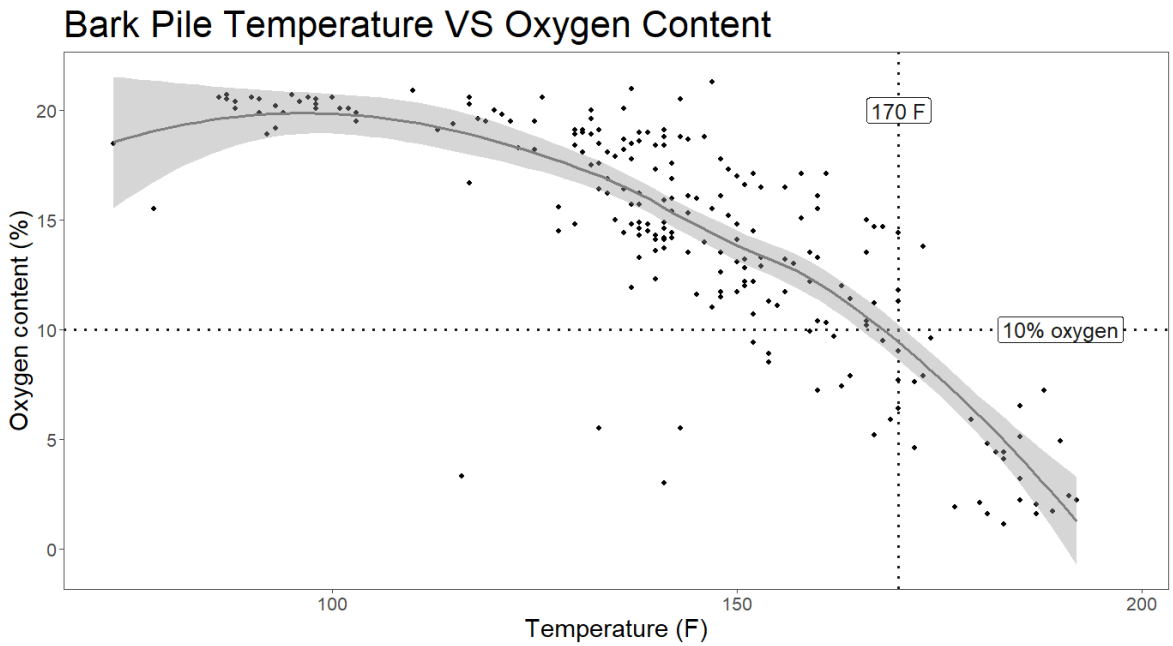


Chart Provided by Willamette Valley 12/07/2020

11. START-UP AND SHUTDOWN/ALTERNATIVE OPERATING SCENARIOS/POLLUTION PREVENTION

11.a. Start-up and Shutdown Provisions. Pursuant to SWCAA 400-081 "Start-up and Shutdown", technology based emission standards and control technology determinations shall take into consideration the physical and operational ability of a source to comply with the applicable standards during start-up or shutdown. Where it is determined that a source is not capable of achieving continuous compliance with an emission standard during start-up or shutdown, SWCAA shall include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

Bark Dehydrator – Wood Fired Heater. NO_X and CO emission limits for the wood fired heater are intended to be applicable when the heater is in normal operation. The combustion system of the wood fired heater is not capable of reliably achieving these emission levels until it establishes and maintains a minimum combustion zone temperature. Consequently, NO_X and/or CO emissions may exceed the applicable emissions limits during start-up and shutdown periods. In consideration of these technical limitations, the applicable NO_X and CO limits do not apply during start-up and shutdown periods.

11.b. Alternate Operating Scenarios. SWCAA conducted a review of alternate operating scenarios applicable to equipment affected by this permitting action. The permittee did not propose or identify any applicable alternate operating scenarios. Therefore, none were included in the permit requirements.

11.c. Pollution Prevention Measures. SWCAA conducted a review of possible pollution prevention measures for the facility. No pollution prevention measures were identified by either the permittee or SWCAA separate from those measures required under BACT considerations. Therefore, none were included in the permit requirements.

12. EMISSION MONITORING AND TESTING

12.a. Emission Testing – Bark Dehydrator. Emission testing of the Bark Dehydrator is required on a continuing 5-year cycle. Emission testing must be conducted while firing each of the approved fuels and drying both aged and unaged bark. All emission testing shall be conducted in accordance with ADP 25-3689, Appendix A.

Heat for the Heil Bark Dehydrator is provided by either a natural gas heater or a wood-fired heater. These are essentially two different emission units so testing in both modes is needed, primarily to confirm compliance with the CO, NO_X, and PM emission limits. Emissions of VOCs, including HAPs and TAPs primarily originate from the bark dryer. These organic compounds are the result of degradation of the bark during storage and aging. Aged wood has the highest potential for generating these compounds, so at least three of the test runs must be conducted on the aged bark product.

EPA Method 320 was chosen as the best option for determining total VOC emissions because every attempt at using EPA Method 25A at this facility has failed to yield useful results, even when the sample line temperature was increased to over 300°F. EPA Method 25 also has the potential to provide a total VOC value, but the permit limit was based on EPA Method 320 results, so EPA Method 320 has been retained as the reference method. If Method 25 is required by SWCAA in addition to Method 320, Method 25 results (reported as C) must be scaled to a VOC value by assuming the same ratio of compounds identified in the available speciated results (e.g. the Method 320 analysis). For example, for a Method 25 test result of 10 mg as carbon, where 50% of the carbon in the speciated samples comes acetic acid, we would assume that 5 mg of the Method 25 results are from acetic acid. This would be scaled to "as acetic acid" by multiplying by the ratio of the acetic acid molecular weight to the molecular weight of carbon in the acetic acid: 5 mg * 60.052 / 24.02 = 12.5 mg.

The ASTM method for wood moisture content was updated from ASTM D2016 to ASTM D4442. ASTM D4442 superseded ASDM D2016. The ASTM method for wood heat content was updated from D2015 to E870. D2015 used to be a general method for determining the heat content of solid fuels and is now specific to coal and coke. ASTM E870 is used to determine the heat content of wood. The test method for wood nitrogen content was updated

to either D5373 or E778 which are expected to be more specific to this type of solid fuel than the Association of Official Agricultural Chemists method 978.02 which is intended for fertilizers.

12.b. Emission Monitoring – Bark Dehydrator. Emission monitoring of the Bark Dehydrator is required on a continuing 12-month cycle. Emission monitoring must be conducted while firing each of the approved fuels. Annual monitoring is expected to be sufficient to prevent an exceedance of the permitted emission limits. Emission monitoring is not required in years when emission testing is conducted. All emission monitoring shall be conducted in accordance with ADP 25-3689, Appendix B.

13. FACILITY HISTORY

13.a. Previous Permitting Actions. SWCAA has previously issued the following Permits for this facility:

Permit Number	Application Number	Date	Purpose
22-3537	L-728	8/24/2022	Replacement of the Grinder #5 baghouse, rotary drum dryer, cyclone, and replacement of top plenum of primary baghouse.
Superseded/Obsolete			
21-3459	L-700	3/18/2021	Establishment of VOC and HAP/TAP emission limits for alder bark wood drying operations. Identification and quantification of HAP and TAP emissions. Superseded by ADP 22-3537.
20-3438	L-714	11/6/2020	Installation of new bark flour sifters, new pneumatic material handling systems, new bulk packaging system, and removal of existing sifters and bulk packaging system. Superseded by ADP 21-3459.
14-3096	L-671	6/30/2014	Installation and operation of a Munson wood flour blender with associated Grinding and Sizing LLC baghouse (3000 acfm). Superseded by ADP 20-3458.
10-2918	L-638	2/9/2010	Modification of emission limits for wood fired dehydrator heater. Installation of replacement dehydrator baghouse. Superseded by ADP 14-3096.
95-1830R2	L-599	7/31/07	Modification of rotary dryer to incorporate a wood fired heater (Energy Unlimited model EU10R15 heater rated at 10.0 MMBtu/hr). Superseded by ADP 10-2918.
95-1830R1	L-481	7/6/2001	Modification of bark processing facility and replacement of existing equipment (Carothers model 110TR10 baghouse, new Carothers cyclone, additional equipment). Superseded by ADP 95-1830R2.
96-1891	L-362	6/17/1996	Installation of new vacuum system in packaging area (Flex Kleen 84CT46 baghouse - never installed). Superseded by ADP 95-1830R1.
95-1830	L-350	1/8/1996	Installation of rotary dryer with associated baghouse and cyclone (Heil SD-75-22A Dryer with Eclipse Ratiomatic 1250 RM burner, cyclone, Carter-Day baghouse). Superseded by ADP 95-1830R1.
92-1435	L-276	6/18/1992	Installation of hydro-mulch manufacturing equipment with associated material handling and pollution control equipment. Equipment removed.
90-1240	L-225	7/16/1990	Installation of a fugitive dust control system. Equipment removed.
88-982	L-176	4/14/1988	Installation of new bark grinder and associated material handling equipment (Pulvocron grinder, Flex Kleen 100-WRTC-48 baghouse).

Permit Number	Application Number	Date	Purpose
			Superseded by ADP 95-1830R1.
86-860	L-150	2/2/1987	Installation of rotary dryer, hammer mill, associated material sifters, and a pneumatic transfer system (Heil dryer, cyclone, Carter-Day model 120 HPT8 baghouse, rotary airlocks, a cyclone and baghouse). Superseded by ADP 95-1830R1.
80-504	L-99	1/28/1980	Installation of bark grinding equipment and associated emission control equipment (4 Pulvocron grinders, two Flex Kleen model 84CT64 baghouses, two Flex Kleen model 84CT46 baghouses). Superseded by ADP 95-1830R1.

13.b. Compliance History. A search of source records on file at SWCAA identified the following compliance issues during the past five (5) years:

Date	NOV Number	Violation
11/19/2024	11384	Visible emissions from the Bark Dehydrator in excess of 5% opacity for more than 3 minutes in a one-hour period as determined by a certified observer.
1/30/2024	11123	Burning prohibited materials in the wood fuel dehydrator in violation of Air Discharge Permit 22-3537.
11/20/2023	11106	Failure to discharge exhaust air vertically from approved equipment into the ambient air in violation of Air Discharge Permit 22-3537.

14. PUBLIC INVOLVEMENT OPPORTUNITY

14.a. Public Notice for ADP Application L-747. Public notice for ADP Application L-747 was published on the SWCAA internet website for a minimum of (15) days beginning on October 2, 2024.

14.b. Public/Applicant Comment for ADP Application L-747. SWCAA did not receive specific comments, a comment period request or any other inquiry from the public regarding this ADP application. Therefore, no public comment period was provided for this permitting action.

14.c. State Environmental Policy Act. This project is exempt from SEPA requirements pursuant to WAC 197-11-800(3) since it only involves repair, remodeling, maintenance, or minor alteration of existing structures, equipment or facilities, and does not involve material expansions or changes in use. SWCAA issued a determination that the project is exempt from SEPA review on March 5, 2025 (Determination of SEPA Exempt - SWCAA 25-009).