TECHNICAL SUPPORT DOCUMENT

Air Discharge Permit 25-3705
Air Discharge Permit Application L-732

Issued: April 30, 2025

Meridian Hill Compost

SWCAA ID – 2774

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ABBREVIATIONS

List of Acronyms

ADP ..... Air Discharge Permit
AP-42 ..... Compilation of Emission Factors, AP-42, 5th Edition, Volume 1, Stationary Point and Area Sources – published by EPA
ASIL..... Acceptable Source Impact Level
BAAQMD.... Bay Area Air Quality Management District
BACT..... Best available control technology
CAM ..... Compliance Assurance Monitoring
CAS#..... Chemical Abstracts Service registry number
CFR..... Code of Federal Regulations
EPA..... U.S. Environmental Protection Agency
EU ..... Emission Unit
HAP ..... Hazardous Air Pollutant listed pursuant to section 112(b) of the federal Clean Air Act
MACT..... Maximum Achievable Control Technologies
NESHAP..... National Emission Standards for Hazardous Air Pollutants
NOV..... Notice of Violation/
NSPS..... New Source Performance Standard
PSD..... Prevention of Significant Deterioration
RACT..... Reasonably Available Control Technology
RCW ..... Revised Code of Washington
SQER ..... Small Quantity Emission Rate listed in WAC 173-460
Standard..... Standard conditions at a temperature of 68°F (20°C) and a pressure of 29.92 in Hg (760 mm Hg)
SWCAA..... Southwest Clean Air Agency
TAP..... Toxic Air Pollutant identified in WAC 173-460
T-BACT..... Best Available Control Technology for toxic air pollutants
WAC ..... Washington Administrative Code

List of Units and Measures

µm..... Micrometer (10^{-6} meter)
acfm ..... Actual cubic foot per minute
dscfm..... Dry Standard cubic foot per minute
gr/dscf ..... Grain per dry standard cubic foot
hp ..... Horsepower
kW..... Kilowatt
hp .....Horsepower
lb/hr.....Pounds per hour
lb/ton.....Pounds emitted per ton feedstock
lb/ton.....Pounds per year
scfm .....Standard cubic foot per minute
tpy.....Tons per year

List of Chemical Symbols, Formulas, and Pollutants

CO ..... Carbon monoxide

CO_2 ..... Carbon dioxide

CO_2e ..... Carbon dioxide equivalent

HAP ..... Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act

N_2O ..... Nitrous oxide

NH_3 ..... Ammonia

NO_2 ..... Nitrogen dioxide

NO_x ..... Nitrogen oxides

O_2 ..... Oxygen

O_3 ..... Ozone

PM..... Particulate Matter with an aerodynamic diameter 100 µm or less

PM_{10}.....PM with an aerodynamic diameter 10 µm or less

$PM_{2.5}$ .....PM with an aerodynamic diameter 2.5 µm or less

SO_2.....Sulfur dioxide

SO_X .....Sulfur oxides

TAP.....Toxic air pollutant pursuant to Chapter 173-460 WAC

TGOC .....Total Gaseous Organic Carbon

TOC .....Total Organic Carbon

TSP .....Total Suspended Particulate

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:	Meridian Hill Compost, LLC
Applicant Address:	Big Hanaford Road, Centralia, WA 98531
Facility Name:	Meridian Hill Compost, LLC
Facility Address:	Big Hanaford Road, Centralia, WA 98531
SWCAA Identification:	2774
Contact Person:	Samantha Winkle
Primary Process:	Compost Processing Facility
SIC/NAICS Code:	4953: Refuse Systems 562219: Other Nonhazardous Waste Treatment and Disposal
Facility Latitude and Longitude:	46°44'40.71"N 122°51'6.67"W
Facility Classification:	Natural Minor

2. FACILITY DESCRIPTION

Meridian Hill Compost will compost green waste and food waste. The facility will have an annual capacity of 180,000 annual tons of incoming material. Operations will consist of a two-stage composting process, two leachate aeration ponds, an office, shop, and an area for screening finished compost. The facility will be located on approximately 90 acres of land previously owned by the Transalta Mining Company.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit (ADP) application number L-732 dated December 15, 2022. Meridian Hill Compost: submitted ADP application L-732 requesting the following:

- Approval of a new compost processing facility and associated equipment.

This is the initial permitting action for this facility.

4. PROCESS DESCRIPTION

4.a. Composting. Composting practices are aimed at maintaining appropriate temperatures, oxygen concentrations, and moisture levels. If temperatures are too low the reactions that drive the composting process stop occurring. If temperatures are too high the

microorganisms that convert the waste to compost are killed. Low moisture levels are a problem as well because water is needed by the microorganisms and to absorb the heat that the compost generates. High moisture levels inhibit air flow and can cause pockets with low oxygen concentrations. Low oxygen concentrations are not desirable because it can result in anerobic degradation. Anerobic degradation results in the production of organic acids, hydrogen sulfide, and methane. Many of these components are toxic and odorous.

The proposed composting process will consist of two stages referred to as stage 1 and stage 2. A reversing aeration system will be used to control the temperature and oxygen content of the compost piles during stage 1 composting. Piles will be inside of a bunker to maintain a basic structure. Emissions will be controlled by a biofilter during negative aeration. Emissions from positive aeration, and fugitive emissions from negative aeration, will be controlled by a biofiltration layer on the pile. Stage 2 composting is more passive as most of the degradation has occurred at that point in the process. During stage 2 composing, a compost turner is used to physically move the pile to increase the amount of surface area exposed to the surrounding air. The stage 2 compost area will be sloped to allow water to drain to a leachate collection system. In both composting stages, water will be applied as necessary to maintain the proper moisture content.

Stage 1 will be conducted under a roof to better control moisture content and minimize leachate generation.

4.b. Finished Compost Screening. Finished compost will be screened to remove large pieces (overs) that are not useful as compost. Wet suppression will be used to control particulate matter emissions from the screen.

4.c. Aeration Ponds. Aeration ponds will be used to collect leachate from the composting process. The water will be aerated to maintain oxygen concentrations above 1 mg/L. This aeration inhibits the production of toxic air pollutants and odors.

4.d. Horizontal Grinder. An electrically powered horizontal grinder will be used to reduce the size of the incoming feed stock.

4.e. Haul Roads. Trucks will be used to transport feedstock to the facility and ship finished compost offsite.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a. Reversing Aerated Composting System. Four biofilters will be used to control emissions from stage 1 of the composting system. Composting will take place in two buildings. During negative aeration, emissions from each building will be directed to two biofilters. The four biofilters will have an effective area of 3,360 ft^2 each, for a total area of 13,440 ft^2. There will be a total of 32 compost bunkers for stage 1 composting. The bunkers will be divided into four groups of eight bunkers, each with a separate aeration system. Each bunker will have two temperature probes. Details of the aeration system are as follows:

Bunker Dimensions:	90′ x 30′ x 9′
Supply Fan Manufacturer:	Twin City Fan
Supply Fan Model:	Model 300 BCS
Supply Fan Specs:	40 hp, 17,100 cfm
Exhaust Fan Manufacturer:	Twin City Fan
Exhaust Fan Model:	300 HIB
Exhaust Fan Specs:	75 hp, 20,300 cfm

5.b. Finished Compost Screening. A Multistar 3-SE mechanical screen has been used to screen material at other sites. Meridian Hill Compost expects to either purchase the same unit or a similar unit. The unit will be electrically powered. Details of the unit are as follows:

Throughput:	250 m^3/hr
Power:	40 kW
Fine Screen Area:	7.0 m^2
Fine Screen Width:	1,200 mm
Fine Screen Length:	5,863 mm
Coarse Screen Area:	4.8 m^2
Coarse Screen Width:	1,200 mm
Coarse Screen Length:	3,998 mm

5.c. Aeration Ponds. There will be two aeration ponds on site. Pond one will be 0.25 acres and Pond 2 will be 1.3 acres. Pond one will have two cells with oxygen diffusers. Pond one will discharge to pond 2 and ultimately to the Hanford creek drainage system. The aeration ponds are assumed to be negligible sources of emissions as long as dissolved oxygen concentrations are maintained above the level established in the ADP.

Aeration Pond 1 Cell A

Diffuser Make / Model:	Triple Point Environmental / 750T
Diffuser Flow Rate:	29.5 scfm for each diffuser (4 diffusers)
Blower Make / Model:	Gardner Denver / 3H-DSL Positive Displacement Blower
Blower Specs:	7.5 hp 120 scfm rating

Aeration Pond 1 Cell B

Diffuser Make / Model:	Triple Point Environmental / 750T
Diffuser Flow Rate:	15.6 scfm for each diffuser (2 diffusers)
Blower Make / Model:	Gardner Denver / 3H-DSL Positive Displacement Blower
Blower Specs:	3 hp, 35 scfm

5.d. Haul Roads. There will be approximately 1.14 miles of haul roads on site. Trucks are 26,000 lbs each and with the associated load, they can weigh up to 50,000 lbs.

5.e. Insignificant emission units. An electric grinder will be used to reduce the size of incoming material to make it more suitable for composting. The details of the grinder that likely will be used are as follows:

Motor Rating:	350 hp
Motor Make / Model:	WEG / W22
Voltage:	460V or 380V, 3 phase

5.f. Equipment/Activity Summary.

ID No.	Equipment/Activity	Control Equipment/Measure
1	Reversing Aerated Composting System	Biofilter, Temperature Monitoring, Biofilm, Compost Turning
2	Finished Compost Screening	High Pressure Spray System
3	Aeration Ponds	Oxygen Diffusers
4	Haul Roads	Wet Suppression

6. EMISSIONS DETERMINATION

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.

Nothing precludes the use, including the exclusive use of any credible evidence or information relevant to identifying or quantifying emissions if methods identified above, in the ADP, or elsewhere in this TSD have not provided adequate quantification of actual emissions.

6.a. Direct Emission Composting: VOC Emissions were calculated using data from a source test performed at Silvar Spring Organics in June of 2023. During this test it was determined that total VOC emissions were 0.265 lb/ton compost. An uncontrolled VOC emission factor of 2.65 lb/ton compost was established, assuming 90% control throughout the entire process. This is conservative as during part of the active composting process VOCs are being emitted directly to atmosphere and are therefore uncontrolled. This emission factor was then used to estimate potential emissions at the Meridian Hill composting facility. It was assumed that during active phase one composting the facility will be in negative and positive aeration modes 50% of the time each. A 75% control efficiency was assumed during positive aeration because a 12-inch biofiltration layer is required by the Air Discharge Permit. A control efficiency of 90% was assumed during negative aeration, as the composting emissions will pass through an engineered biofilter. The control efficiencies used came from the reference "ARB Emissions Inventory Methodology for Composting Facilities" published in March 2015. The emission factor used for stockpiled material was also cited in this report. Emissions from stage 2 composting were assumed to be uncontrolled, however this is conservative as the compost will be turned frequently, which should result in some reduction in VOC emissions.

Composting VOC Emissions

Incoming waste stockpile time = 1 days (average)

Source Description	Rate (ton/yr)	Operating Hours per Year	VOC Emission Factor[2] (lb/ton)	VOC (lb/hr)	VOC (tpy)
Stage 1	180,000	8,760	0.417	8.58	37.56
Stage 2	180,000	8,760	0.265	5.45	23.85
			lb/ton/day		
Incoming Stockpile	180,000	8,760	0.200	4.11	18.00
			Total =	18.13	79.41

HAP and TAP emissions were calculated using the results of a source test performed at Silver Spring Organics in July 2014. Emission factors were calculated for both positive and negative aeration during this test and those aeration factors were assumed to be similar to what can be expected at Meridian Hill. The ratio of total HAP/TAP emissions emitted during the second phase of composting is assumed to be the same as the ratio of VOC emission established using the methodology stated above. Actual HAP and TAP emissions for Meridian Hill compost will be calculated from source test data collected from Meridian Hill when test data is available.

VOC Emissions Ratio (Total:Stage 2) =			63.5%				
			Emission Factors				
Pollutant	**CAS #**	**HAP**	**Positive Aeration lb/ton[1]**	**Negative Aeration (lb/ton)[2]**	**Total (lb/yr)**	**1998 TAP (lb/yr)**	**HAP (lb/yr)**
Ammonia	7664-41-7	NO	5.80E-03	8.81E-04	983.1	983.1	
Ammonia (permit limit)					13,500	13,500	
Benzene	71-43-2	YES	7.74E-05	4.01E-05	17.29	17.3	17.3
Carbon Disulfide	75-15-0	YES	1.36E-04	1.07E-04	35.76	35.8	35.8
Allyl Chloride	107-05-1	YES	4.20E-05	1.06E-05	4.73	4.7	4.7
Hexane	110-54-3	YES	2.95E-05	2.81E-05	8.48	8.5	8.5
Isopropyl Alcohol	67-63-0	NO	4.36E-04	3.21E-05	68.88	68.9	
Methanol	67-56-1	YES	2.93E-02	7.81E-05	4,323	4,323	4,323
Chloromethane	74-87-3	YES	1.29E-04	6.51E-05	28.56	28.6	28.6
MEK	78-93-3	NO	9.91E-03	4.90E-05	1,465	1,465	
MIBK	108-10-1	YES	5.01E-04	1.39E-05	46.34	46.3	46.3
Propylene	115-07-1	NO	1.21E-03	1.00E-03	325.19		
Styrene	100-42-5	YES	2.91E-04	1.45E-05	27.50	27.5	27.5
Toluene	108-88-3	YES	3.34E-04	1.27E-04	67.83	67.8	67.8
Vinyl Acetate	108-05-4	YES	3.51E-04	2.28E-05	55.00	55.0	55.0
Xylenes	1330-20-7	YES	1.04E-04	4.28E-05	13.17	13.2	13.2
					Total (tons) =	**9.83**	**2.31**

Comparisons to the 1998 version of WAC 173-460 Small Quantity Emission Rates (SQERs)

Pollutant	CAS #	HAP	Total Emissions (lb/yr)	Total (lb/hr)	SQER (lb/yr)	SQER (lb/hr)	Modeling Required?
Ammonia	7664-41-7	NO	983.1	1.1E-01	17,500	2	NO
Benzene	71-43-2	YES	17.29	2.0E-03	20	--	NO
Carbon Disulfide	75-15-0	YES	35.76	4.1E-03	17,500	2	NO
Allyl Chloride	107-05-1	YES	4.73	5.4E-04	175	0.02	NO
Hexane	110-54-3	YES	8.48	9.7E-04	22,750	2.6	NO
Isopropyl Alcohol	67-63-0	NO	68.88	7.9E-03	43,748	5	NO
Methanol	67-56-1	YES	4,323	4.9E-01	43,748	5	NO
Chloromethane	74-87-3	YES	28.56	3.3E-03	43,748	5	NO
MEK	78-93-3	NO	1,465	1.7E-01	43,748	5	NO
MIBK	108-10-1	YES	46.34	5.3E-03	43,748	5	NO
Propylene	115-07-1	NO	325.19	3.7E-02	--	--	NO
Styrene	100-42-5	YES	27.50	3.1E-03	43,748	5	NO
Toluene	108-88-3	YES	67.83	7.7E-03	43,748	5	NO
Vinyl Acetate	108-05-4	YES	55.00	6.3E-03	22,270	2.6	NO
Xylenes	1330-20-7	YES	13.17	1.5E-03	43,748	5	NO

Comparisons to the 2019 version of WAC 173-460 Small Quantity Emission Rates (SQERs)

Pollutant	CAS #	HAP	Total Emissions (lb/yr)	Averaging Period	SQER (lbs/ Averaging Period	Emissions (lbs/ averaging period	Modeling Required ?
Ammonia	7664-41-7	NO	983.1	24-hour	37	2.69	NO
Benzene	71-43-2	YES	17.29	Annual	21	17.29	NO
Carbon Disulfide	75-15-0	YES	35.76	24-hour	59	0.10	NO
Allyl Chloride	107-05-1	YES	4.73	Annual	27	4.73	NO
Hexane	110-54-3	YES	8.48	24-hour	52	0.02	NO
Isopropyl Alcohol	67-63-0	NO	68.88	1-hr	5.9	0.01	NO
Methanol	67-56-1	YES	4,323	24-hour	1500	11.84	NO
Chloromethane	74-87-3	YES	28.56	24-hour	6.7	0.08	NO
MEK	78-93-3	NO	1,465	24-hour	370	4.01	NO
MIBK	108-10-1	YES	46.34	24-hour	220	0.13	NO
Propylene	115-07-1	NO	325.19	24-hour	220	0.89	NO
Styrene	100-42-5	YES	27.50	24-hour	65	0.08	NO
Toluene	108-88-3	YES	67.83	24-hour	370	0.19	NO
Vinyl Acetate	108-05-4	YES	55.00	24-hour	15	0.15	NO
Xylenes	1330-20-7	YES	13.17	24-hour	16	0.04	NO

6.b. Compost Screening. At the end of the composting process finished compost is screened to remove oversized material. Particulate emissions are calculated based on AP-42 11.19.2 "Emission Factors for Crushed Stone Processing Operations" factors for fines screening.

Screening Emissions

Source Description	Rate (ton/yr)	PM factor (lb/ton)	$PM_{10/2.5}$ factor (lb/ton)	PM Emissions (tpy)	$PM_{10/2.5}$ Emissions (tpy)
Compost Screening	180,000	0.0036	0.0022	0.324	0.198

6.c. Haul Roads. Emissions from haul roads were calculated using default emission calculations from EPA AP-42, Section 13.2.2 (11/06), an average load weight of 24 tons, an average silt content of 4.8%, and an average round trip distance of 1.14 miles. This does not include activities by nonroad equipment. The use of wet suppression is expected to provide an overall control efficiency of 80% for haul road emissions.

$$E = k\left(\frac{s}{12}\right)^{a}\left(\frac{w}{3}\right)^{b}$$

Where: w = average truck weight in tons;
s = road surface silt content (%); and
The constants k, a, and b are given in the table below:

Constant	$PM_{2.5}$	PM_{10}	PM_{30} (assumed to represent PM)
k (lb/vehicle mile traveled)	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

Maximum haul road emissions are estimated in the table below.

Haul Road Emissions

Average Truck Weight =	50	tons (assumes empty wt of 26 tons)
Average Round Trip Distance =	1.14	miles
Amount of Aggregate per Load =	12.0	tons
Total Miles Traveled =	17,670	miles
Assumed Silt Content =	4.8%	
Assumed Control (wet suppression) =	80%	

Pollutant	Uncontrolled Emission Factor lb/mile	Controlled Emission Factor lb/mile	Emissions tpy	Emission Factor Source
PM	9.15	1.83	16.17	AP-42 13.2.2 (11/06)
PM_{10}	2.33	0.47	4.12	AP-42 13.2.2 (11/06)
$PM_{2.5}$	0.23	0.047	0.41	AP-42 13.2.2 (11/06)

6.d. Emissions Summary

Air Pollutant	Potential to Emit (tpy)
NO_X	0
CO	0
VOC	80.00
SO_2	0
PM	16.49
PM_{10}	4.32
$PM_{2.5}$	0.61

Air Pollutant	Potential to Emit (tpy)
CO_2/CO_2e	-
TAPs	9.83
HAPs	2.31
NH_3	6.75

7. REGULATIONS AND EMISSION STANDARDS

Regulations have been established for the control of emissions of air pollutants to the ambient air. Regulations applicable to the proposed facility 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 following regulations, codes, or requirements. These items establish maximum emissions limits that could be allowed and are not to be exceeded for new or existing facilities. More stringent limits are established in this Permit consistent with implementation of Best Available Control Technology (BACT):

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.15) 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. This law applies to the facility.

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 ADP for installation and establishment of an air contaminant source. This law applies to the facility.

7.c. Washington Administrative Code (WAC) 173-401 "Operating Permit Regulation" requires all major sources and other sources as defined in WAC 173-401-300 to obtain an operating permit. This regulation is not applicable because this source is not a potential major source and does not meet the applicability criteria set forth in WAC 173-401-300. The facility does not emit any criteria pollutants or HAP above major thresholds; therefore, this regulation does not apply to the facility.

7.d. WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" requires BACT for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.

The facility emits TAPs; therefore, this regulation applies to the facility.

7.e. WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM_{10}, $PM_{2.5}$, lead, SO_2, NO_X, ozone, and CO in the ambient air, which must not be

exceeded. The facility emits PM_{10}, $PM_{2.5}$, and VOC (an ozone precursor); therefore, certain sections of this regulation apply.

7.f. 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, SO_2, concealment and masking, and fugitive dust. This regulation applies to the facility.

7.g. SWCAA 400-040(1) "Visible Emissions" requires that emissions of an air contaminant from any emissions unit must not exceed twenty percent opacity for more than three minutes in any one hour at the emission point, or within a reasonable distance of the emission point. This regulation applies to the facility.

7.h. SWCAA 400-040(2) "Fallout" requires that emissions of PM from any source must not be deposited beyond the property under direct control of the owner(s) or operator(s) of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited. This regulation applies to the facility.

7.i. SWCAA 400-040(3) "Fugitive Emissions" requires that reasonable precautions be taken to prevent the fugitive release of air contaminants to the atmosphere. This regulation applies to the facility.

7.j. SWCAA 400-040(4) "Odors" requires any source which generates odors that may unreasonably interfere with any other property owner's use and enjoyment of their property to use recognized good practice and procedures to reduce these odors to a reasonable minimum. This source must be managed properly to maintain compliance with this regulation. This regulation applies to the facility.

7.k. SWCAA 400-040(8) "Fugitive Dust Sources" requires that reasonable precautions be taken to prevent fugitive dust from becoming airborne, and minimize emissions. This regulation applies to the facility.

7.l. SWCAA 400-060 "Emission Standards for General Process Units" requires that all new and existing general process units do not emit PM in excess of 0.23 g/Nm^3_{dry} (0.1 gr/dscf) of exhaust gas. The facility has general process units; therefore, this regulation applies to the facility.

7.m. SWCAA 400-109 "Air Discharge Permit Applications" requires that an ADP 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 ADP application to request such changes. An ADP 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. This regulation applies to the facility.

7.n. SWCAA 400-110 "New Source Review" requires that SWCAA issue an ADP in response to an ADP application prior to establishment of the new source, emission unit, or modification. The new units meet the definition of a new source; therefore, this regulation applies to the facility.

7.o. SWCAA 400-113 "Requirements for New Sources in Attainment or Nonclassifiable Areas" requires that no approval to construct or alter an air contaminant source will 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) BACT 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.

The facility is located in an area that is in attainment or nonclassifiable for (PM, NO_X, CO, SO_2, O_3); therefore, this regulation applies to the facility.

8. BACT/PSD/CAM DETERMINATIONS

The proposed equipment and control systems incorporate BACT for the types and amounts of air contaminants emitted by the processes as described below:

8.a. BACT Determination – Composting Process. The processes that control emissions also drive product quality. As a result, many of the conditions in the permit do not require new practices, rather just additional monitoring and recordkeeping requirements. The composting process uses a reversing aeration system, moisture control, and measurements of product quality to maintain oxygen concentrations, C:N ratios, moisture content, and adequate mixing.

Control Technology Identification

A number of control options exist for composting activities, including the options listed below. Options 1-5 may be roughly equally effective, and the remaining options are listed in descending order of effectiveness.

1. Positively aerated static pile with 12" biofiltration layer
2. Reversing aerated static pile with 12" biofiltration later, biofilter to control emissions from negative aeration
3. Full enclosure vented to a biofilter
4. Full enclosure vented to a scrubber
5. Gore™ Cover System or similar
6. Negative aeration vented to a biofilter (~ 80% capture)
7. Negative aeration of primary pile vented to biofilter (~80% capture)
8. Positive (or adequate passive) aeration using a 6" "compost blanket" biofilter (75% control of VOC emissions[1])
9. General process controls
10. Uncontrolled windrow

[1] "Emissions Testing of Volatile Organic Compounds from Greenwaste Composting at the Modesto Compost Facility in the San Joaquin Valley" May 2008

Options 1-5 (capture and treatment of gaseous pollutants with a biofilter or chemical scrubber, or use of the Gore™ Cover System) are probably equally effective means of emission control. Capture and treatment of gaseous pollutants with a biofilter is the least expensive emission control option, although there are off-setting process advantages of the Gore™ Cover System making it the preferred option of some compost manufacturers. Negative aeration alone of a compost pile and treatment of the exhaust with a biofilter is less effective at controlling emissions from the composting process because of incomplete capture of gaseous pollutants. Some losses may also be expected in "fully enclosed" buildings due to necessary door openings to accommodate vehicles or equipment.

Options 2 and 3 require substantial capital cost for the construction of a fully enclosed building and, based on test results reviewed by SWCAA, do not provide a greater level of emission control.

Options 6–8 probably result in roughly similar levels of control. There can be a wide variation in the capture efficiency of negative aeration systems depending on how the pile is built. 80% capture is an engineering estimate only – higher levels of control can be achieved. In a May 2008 report to the California Integrated Waste Management Board[1], the contractor reported that the use of a compost blanket biofilter cost approximately $0.60 per ton of material.

SWCAA concurs with the applicant that the proposed option of a temperature instrumented reversing aeration system utilizing a minimum 12" biofiltration layer to control emissions during positive aeration and a biofilter to control emissions during negative aeration is the

top BACT choice. In addition, proper control of composting parameters is equally important to the physical design of the composting system. SWCAA believes that proper control of composting parameters involves:

1. Maintaining initial moisture content below 70% by weight.
2. Maintaining at least 5% O_2 content in the free air space, preferably maintaining 10% O_2 by volume.
3. Managing incoming feedstocks for a C:N ratio of at least 25:1, preferably 30:1.
4. Adequately mixing the incoming feedstocks so that the moisture and nutrients, including C:N, are maintained in proper proportions in all parts of the composting mass.

Items 1-4 above were included in the air discharge permit to meet the requirements of BACT.

8.b. BACT Determination – Screening and Haul Roads. The use of wet suppression as necessary has been approved to reduce particulate emissions from screening the final product and haul roads. In most cases, SWCAA expects the final product to contain enough moisture that additional wet suppression is not necessary.

8.c. Prevention of Significant Deterioration (PSD) Applicability Determination. 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.d. 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 (Title V) permit.

9. AMBIENT IMPACT ANALYSIS

9.a. Criteria Air Pollutant Review. Emissions of NO_x, CO, PM, VOC (as a precursor to O_3), and SO_2 are emitted at levels where no adverse ambient air quality impact is anticipated.

9.b. Toxic Air Pollutant Review. The new equipment and control equipment proposed in ADP application L-732 will limit emissions of Class A and B toxic air pollutants to below the applicable Small Quantity Emission Rates (SQER) specified in WAC 173-460; therefore, no adverse air quality impact is anticipated.

Conclusions

9.c. Construction and operation of a compost processing facility, as proposed in ADP application L-732, will not cause the ambient air quality requirements of 40 CFR 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.

9.d. Construction and operation of a compost processing facility, as proposed in ADP application L-732, 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.e. Construction and operation of a compost processing facility, as proposed in ADP application L-732, will not violate 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 25-3705 in response to ADP application L-732. ADP 25-3705 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

10.a. Supersession of Previous Permits. This is the initial permitting action for the facility.

10.b. Emission Limits. Facility-wide emission limits are based on the sum of the emission limits for approved equipment calculated in Section 6 of this Technical Support Document.

An emission limit for ammonia was established for the composting system which is equal to the SQER for ammonia according to the 2019 version of WAC 173-460. This is higher than the emission factors presented by the applicant to account for possible variations in compost parameters. This emission rate (0.075 lb/ton incoming waste) is well below the level of 0.20 lb/ton incoming waste that has been considered BACT for smaller facilities.

10.c. Operational Limits and Requirements

Aeration and Minimum Oxygen Content. A minimum oxygen concentration of at least 5% by volume is required in the free air space of composting materials. SWCAA has determined that when the oxygen concentration is measured below 5% there is an increased likelihood of anaerobic conditions being present in portions of the compost pile. The basis of the BACT determination is forced aeration to maintain this minimum oxygen level, and this level of oxygen is very unlikely to be maintained without forced aeration with this pile design, therefore forced aeration was mandated in the permit.

Compost Maturity Requirement for Curing or Finishing Piles. Only compost that is properly matured can be piled without creating anaerobic conditions, malodors, and excessive emissions. For the purposes of this requirement, SWCAA believes that a proper level of compost maturity is indicated by a CO_2 evolution rate of 7 mg CO_2-C/ g organic matter/day or less (TMECC method 05.08-B), a minimum Solvita value of 5, or a maximum Biologically Available Carbon (BAC) CO_2 evolution rate of 8 mg CO_2-C/g organic carbon per day (TMECC method 05.08-F). No ammonia stability testing or standard was required because SWCAA presumes that the carbon to nitrogen ratio requirement in the permit is adequate to prevent excessive ammonia emissions.

Carbon to Nitrogen Ratio. The initial carbon to nitrogen ratio of the compost must be no less than 25:1 to prevent excess emissions of ammonia. As the compost matures, much of the carbon is lost to CO_2 and the carbon to nitrogen ratio decreases. By starting with a minimum carbon to nitrogen ratio of at least 25:1, the potential for excessive ammonia emissions in the aging compost is decreased.

Moisture Content. When the compost moisture exceeds 60% - 70% the amount of free air space may be reduced to the point where anaerobic conditions are likely to develop. In addition, excessive amounts of water surrounding composting materials can slow oxygen transfer to the point that anaerobic conditions develop on the surface of the material even when adequate oxygen exists within the free air space. For these reasons, the permit requires that the moisture content of the mixed active compost not exceed 70% by weight. It is expected that the initial moisture level will be the highest, and the pile will dry throughout the composting process.

Scraping/Cleaning of Process Areas. Scraping or sweeping clean all process areas of actively compostable materials each day is required to prevent material from being compacted. These compacted materials often emit offensive odors, presumably because they are decaying anaerobically. Actively compostable materials include incoming waste and materials in the active compost pile.

Feedstock Limitations. SWCAA believes that the current facility design does not enable the facility to handle fish, seafood, meat products, meat byproducts, feathers, or food waste without the generation of excessive malodors. SWCAA believes that BACT for the composting of such wastes is the use of full enclosure and biofiltration or other odor control technology to reduce the captured odorous emissions. For this reason, only green waste and wood waste are approved as primary feedstocks.

Prevention of Leachate Ponding. Ponding leachate can be a significant source of malodors. All leachate must be actively managed to control the generation of significant malodors. Ponding can be caused by swales in the concrete, berms of compost, or other factors that prevent adequate drainage.

Aeration Ponds. SWCAA has determined that BACT for the control of odorous emissions from the Aeration Ponds is the maintenance of aerobic conditions. A minimum dissolved oxygen level of 1 ppm in the top two feet of the pond was established to assure that malodors are not generated. Based upon experience with municipal and industrial wastewater, maintenance of aerobic conditions in the leachate will virtually eliminate the generation of odorous emissions.

Reasonable Precautions to Prevent Dust. This requirement is drawn from SWCAA 400-040(8)(a). Examples of reasonable precautions include the use of wet suppression to minimize wind erosion of storage piles, wetting down dry material prior to handling, and the use of enclosures for dusty materials.

Progressive Odor Management Plan (POMP). The POMP details the proper responses to nuisance odors. This approach was first implemented by SWCAA for Little Hanaford Farms.

Putrescible Materials Handling. To prevent excessive emissions and the generation of malodors, putrescible materials must be incorporated into active compost piles or removed from the site in a timely manner. The waste delivered by dedicated green waste hauling trucks (e.g. the trucks used by county waste haulers for yard waste recycling) is very likely to be odorous due to the fact that the material has remained in a waste bin for a period of time prior to being picked up, and because the trucking tends to compress the material, causing anaerobic conditions. SWCAA believes that this material should be incorporated into compost piles or removed from the site by the end of the work day to minimize odor impacts. When this schedule cannot be met due to delays beyond the control of the Permittee, the material may be mixed with wood chips to control odor until its final disposition the next day.

10.d Monitoring and Recordkeeping. Sufficient monitoring and recordkeeping was established to document compliance with the annual emission limits and provide for general requirements (e.g. excess emission reporting, annual emission inventory submission). 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.

Oxygen and Temperature Monitoring. The actively composting material must be closely watched and actively managed to prevent conditions that can lead to excess emissions or excessive odor generation. Weekly oxygen sampling of the actively composting material was required for the first four weeks of operation to provide a reasonable assurance that the current temperature-based aeration schedule is providing adequate aeration. Continuous temperature monitoring was required because this is the parameter used to determine the aeration rate and is an indicator of compost activity.

Stability and Maturity of Material Added to Curing Pile. The permit requires initial and period testing of compost piles moved off aeration to ensure it has achieved a minimum stability prior to removing the material from active aeration. The minimum stability is required to assure that highly active material is not placed in the curing pile where it could become anaerobic and generate excessive malodors. As a minimum the CO_2 evolution rate shall not exceed 7 mg/ CO_2-C evolved per gram volatile solids per day. This is equivalent to a Solvita index of 5 or higher.

Carbon to Nitrogen Ratio of Incoming Feedstocks. The initial carbon to nitrogen ratio will change depending upon the compost mix. The type of incoming yard waste will change with the season, the weather, and the source of the feedstocks, therefore the carbon to nitrogen ratio must be determined prior to building each composting pile.

Moisture Content Monitoring. Moisture content monitoring was required prior to building each pile to provide a reasonable assurance of compliance with the maximum moisture content requirement. Because this facility will utilize active aeration that tends to dry the pile and does not plan to add water to the pile during the active composting phase, this is expected to represent the maximum moisture content during the process.

10.d. Reporting Requirements. ADP 25-3705 establishes general reporting requirements for annual air emissions, upset conditions and excess emissions. Specific reporting requirements are established for material throughput. Reports are to be submitted on an annual basis.

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 must 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 will include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

To SWCAA's knowledge, this facility can comply with all applicable standards during startup and shutdown.

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 approval conditions.

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 or in addition to those measures required under BACT considerations. Therefore, none were included in the approval conditions.

12. EMISSION MONITORING AND TESTING

12.a. Emission Testing Requirements. Emissions must be measured at the inlet and outlet of the biofilter every 60 months in order to quantify emissions and ensure the biofilter is operating properly. The biofilter inlet data is also useful to estimate emissions from the surface of the composting piles when a control efficiency is assumed or measured for the biofiltration layer, or when a biofilter fails.

13. FACILITY HISTORY

This will be a new facility.

14. PUBLIC INVOLVEMENT OPPORTUNITY

14.a. Public Notice for ADP Application L-732. Public notice for ADP application L-732 was published on the SWCAA website for a minimum of fifteen (15) days beginning on January 20, 2023.

14.b. Public/Applicant Comment for ADP Application L-732. SWCAA did not receive specific comments, a comment period request, or any other inquiry from the public or the applicant regarding ADP application L-732. Therefore, no public comment period was provided for this permitting action.

14.c. State Environmental Policy Act. Lewis County was the lead agency for SEPA and issued a Mitigated Determination of Non-Significance for the project on September 6, 2022 (SEP22-0033).