Engineering Evaluation Report
Davis Street SMART, Plant #2773
2615 Davis Street, San Leandro, CA
Application #29215

BACKGROUND

Davis Street SMART, ("Applicant") operates a transfer station/resource recovery complex which overlies the closed Davis Street landfill, located at 2615 Davis Street in San Leandro (Plant #2773). Current site operations include a municipal solid waste transfer station, a single stream recyclable material recovery facility, a public disposal/transfer area, and outdoor green waste/wood waste public drop-off and processing area, a mixed materials recovery facility (for construction and demolition debris and dry waste), a green waste processing and transfer building, and a garden center. The applicant is proposing to undertake major improvements to enhance its recycling and resource recovery operations.

The applicant is proposing to install two new buildings: Organic Material Recovery Facility (OMRF) and Organics Material Composting Facility (OMCF). The OMRF will be an 61,400 square foot food waste/organics recycling building and the OMCF will be an 135,000 square foot food waste/organics/green waste composting facility for processing of the organics fraction feedstock conveyed from the OMRF as well as source-separated green waste and food waste.

The application for the Organic Material Recovery Facility (OMRF) was received and issued an Authority to Construct under Application #28167. This application (#29215) is for the Organics Material Composting Facility (OMCF) and will consist of the following equipment:

S-64 OMCF Organic Material Stockpiles
Abated by Dust Collector DC-1 A-12 (12,316 cfm) and Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-65 OMCF Pre-Processing Material Handling Operation
Abated by Dust Collector DC-1 A-12 (12,316 cfm) and Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-66 OMCF Rotary Drum Reactors #1 and #2 (Phase 1)
Abated by Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-67 OMCF Rotary Drum Reactors #3 and #4 (Phase 2)
Abated by Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-68 OMCF In-Vessel Composting Lanes #1 through #8 (Phase 1)
Abated by Acid Gas Scrubber and Biofilter #3 A-9 (Surface area = 5,176 sq ft, Depth = 8 feet, Blower flow rate = 48,000 cfm, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-69 OMCF In-Vessel Composting Lanes #9 through #16 (Phase 2)
Abated by Acid Gas Scrubber and Biofilter #4 A-11 (Surface area = 5,176 sq ft, Depth = 8 feet, Blower flow rate = 48,000 cfm, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-70 OMCF Post-Processing Material Handling Operation
Abated by Dust Collectors DC-2 A-13 (12,316 cfm), DC-3 A-14 (12,316 cfm), DC-4 A-15 (12,316 cfm), and DC-5 A-16 (10,012 cfm) and Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

Note:
Based on preliminary design, though cyclones (A-8 and A-10) were initially proposed to abate IVCs (S-68 and S-69) they will not be installed because the moisture content in the material processed in the IVCs will be at a level where minimal particulate matter (PM) will present. It was determined from consulting with experts on the treatment capabilities of cyclones that A-8 and A-10 would “gum-up” due to the high moisture content in the IVC process air thereby negating the design aspect of the cyclone design characteristics.

Any PM that exits the IVCs will be mitigated by the acid scrubber. The high moisture content in the scrubber vessels will capture this PM and the trapped PM will accumulate at bottom of scrubbers. The PM accumulated will be removed during normal maintenance activities. In the extreme circumstance that any PM bypasses the scrubber, the high moisture content and structural aspect of the biofilter media (A-9 and A-11) will capture it.

PROJECT DESCRIPTION

Organic Material Composting Facility

The proposed OMCF will process certain organic materials into a marketable compost product. Feedstock streams include sorted material from the OMRF, as well as Source Separated Organics (SSO) such as food waste, and processed green waste materials from the existing green waste operation (S-2) at Plant 2773.

The OMCF project will be constructed in two phases. Phase 1 of the project will commence operation at half of the planned capacity of the full project (Lanes 1 through 8 of the 16 lane composting operation). Phase 2 of the project will commence operation of the second half of the planned capacity of the full project (Lanes 9 through 16 of the 16 lane composting operation). This application review addresses the permitting of the full project.

The project will include three main processing blocks, Pre-Processing (S-65), Composting (S-66 to S-69), and Post-Processing (S-70). In Pre-Processing, the organic feedstock streams go through various debagging, screening, and inert separation operations. While some pre-processed material will be charged directly into the Composting operation on the same day, a portion may be staged in an indoor stockpile (S-64) prior to charging to Composting. The Pre-Processing area will be maintained under negative pressure. Any emissions resulting from the stockpiles will be captured in the building and vented to an acid scrubber/biofilter control system (A-7). Any PM emissions will be abated by an internal dust collector (A-12).

The composting operation is a two-step process. In the first step (initial composting), the pre-processed material will be charged into Rotary Drum Reactors (RDRs) where the material spends about three days slowly traveling through a rotating drum with internal ribs to be further broken down. The RDRs (S-66 and S-67) will be adjacent to Pre-Processing (S-65) in the same building. Phase 1 will include two RDRs (S-66) and full buildout will have four RDRs (S-66 and S-67). RDR emissions will be captured and vented to the Pre-Processing acid scrubber/biofilter system (A-7). The material discharged from the RDRs will be transferred to a separate room containing In-Vessel Composting (IVC) lanes where the Composting process is completed over 19 days. At the IVCs (S-68 and S-69) the material will travel through enclosed/covered “lanes,” which will be under negative pressure and lined with aeration pipes. An automated lane turner will be used to turn and agitate the material daily to aerate and moisturize it and move the material down the lanes over the 19-day period. IVC emissions will be captured and vented to an acid scrubber/biofilter system (A-9 and A-11). Phase 1 will include eight IVC lanes (S-68) and full buildout will have 16 IVC lanes (S-68 and S-69). The full buildout configuration will house IVC lanes in two separate rooms with eight IVC lanes in each room.

The finished compost from the IVC lanes will be transferred to the Post-Processing area (S-70) where compost goes through final sizing and inert separation prior to loadout onto trucks. The Post-Processing area will be maintained under negative pressure with internal dust collectors (A-13 to A-16) to abate PM and clean air will be routed back into the area. A process flow diagram of the operation is shown in Figure 1 below.

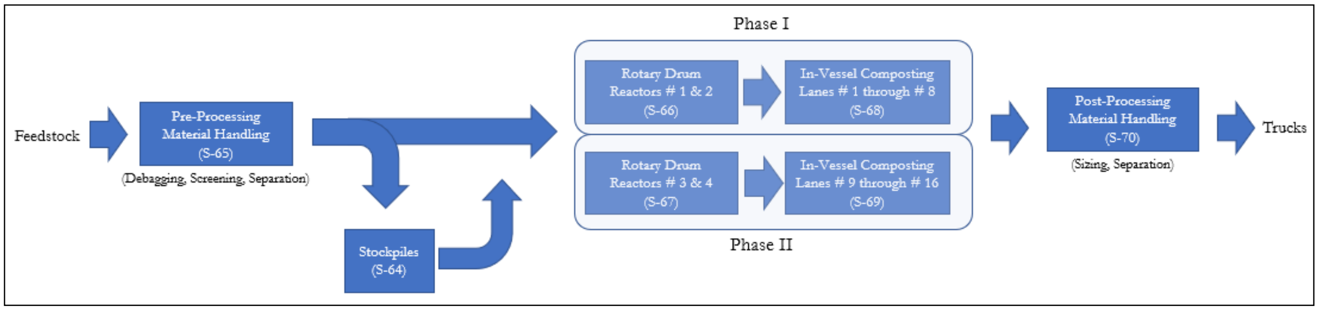

Figure 1. Organic Materials Composting Facility process flow diagram

<u>S-65: Pre-Processing Operation</u>

Feed to the RDRs (S-66 and S-67) includes a mix of organic material (in the 2.5-inch to 12-inch size range) transferred from the OMRF, SSO (food waste), and compostable material from the OMRF (under the 2.5-inch size range). The latter material stream goes through a series of screens and optical/magnetic inert separators in Pre-Processing prior to loading into the RDRs. Material flow for all three organic material streams is handled by a system of conveyors and batch drops, as well as the use of a front-end loader.

<u>S-66 and S-67: Rotary Drum Reactors (RDRs) and S-68 and S-69: In-Vessel Composting (IVC) Lanes</u>

The composting process starts with pre-processed organic feed material charged to the RDRs where it is allowed to biologically react for about three days, which represents the beginning of composting. Material is typically added to the process six days per week.

Since there is more RDR feed available during the week-day than RDR capacity, a portion of the material available to be fed to the RDRs during the week-day will not be fed to the RDRs during the same 24-hour period, and will be held (stockpiled) until it can be fed. Feed to the RDR is placed on the floor after pre-processing in a left to right pattern while the RDR is also loaded (fed) from the floor stockpiles in a left to right pattern. Therefore, the pre-processed, stockpiled materials are loaded into the RDR on a first-in-first out (FIFO) basis.

The partially composted material is then conveyed after screening to the IVC lanes where the composting process is completed over a period of 19 days. It is estimated that ~ 20% of the composting reaction occurs in the RDRs (S-66 and S-67) and ~80% of the composting reaction occurs in the IVC lanes (S-68 and S-69).

The proposed RDR/IVC Composting operation will complete both the active and stabilization (maturation) phases of composting.

<u>S-70: Post-Processing Operation</u>

Material processed in the IVC lanes is transferred through a series of screens and optical/magnetic inert separators in Post-Processing operation prior to loading into trucks for off-site transport. Material flow is handled by a system of conveyors and batch drops.

There are no front end loader emissions from this operation. The finished compost is loaded out into trucks with the use of conveyors.

EMISSIONS

The amount of material that may be processed at individual sources will vary based on the number of operating days and whether individual equipment is shut down due to a breakdown or for maintenance. Different operating scenarios were evaluated (see Appendix A) to identify the maximum material throughputs for individual sources. The identified maximum material throughputs (see Table 1) as well as the total equipment counts (see Table 2) are used to estimate emissions.

Table 1. Maximum Material Throughputs

S-#	Description	Daily Usage (tons/day)	Annual Usage (tons/year)
S-64	Organic Materials Stockpiles	1,711	218,200
S-65	Pre-Processing Material Handling	1,000	218,200
S-66	Rotary Drum Reactors # 1 & 2	454 (181.6)[1]	102,850 (41,140)[1]
S-67	Rotary Drum Reactors # 3 & 4	454 (181.6)[1]	102,850 (41,140)[1]
S-68	In-Vessel Composting Lanes 1 - 8	454 (726.4)[2]	102,850 (164,560)[2]
S-69	In-Vessel Composting Lanes 9 - 16	454 (726.4)[2]	102,850 (164,560)[2]
S-70	Post-Processing Material Handling	435.4	135,860

Notes:
1. Value in parenthesis is the amount of material that exits the source after degradation. Assumes 80 percent of incoming material degrades in the source.
2. Value in parenthesis is the amount of material that exits the source after degradation. Assumes that 20 percent of incoming material degrades in the source.

Table 2 below provides the equipment count for shredding, material transfer, screening, and inert separators for the project at Phase 2 full buildout. Conveyor transfers and drops in Table 2 may be overestimates in relation to the final as-built values.

Table 2. Pre-Processing Operation (S-65) and Post-Processing Operation (S-70) Equipment Counts

Operation	Count (S-65)	Count (S-70)	Comment
Bag Breaker	1	N/A	Debagging operations
Front-End Loader Batch Drop	1	N/A	One loader drop location
Conveyor Drops	30	21	Conveyor drops; Not-including RDR or IVC lanes
Conveyor Transfers	30	21	Not-including RDR or IVC lanes
Screens/Separators	2	4	Not counting optical or magnetic separators
Front-End Loader	1	N/A	One operating loader
RDR and IVC Inlet Conveyor Drops	7	N/A	-
RDR and IVC Inlet Conveyor Transfers	7	N/A	Conveyors to and from RDRs and to IVC lanes
IVC Outlet Conveyor Drops	N/A	3	-
IVC Outlet Conveyor Transfers	N/A	3	Conveyors from IVC lanes

Criteria Air Pollutants

Expected criteria air pollutants from the OMCF include particulate matter [with aerodynamic diameters less than 10 microns (PM_{10}) as well as less than 2.5 microns ($PM_{2.5}$)], precursor organic compounds (POC), non-precursor organic compounds (NPOC), and ammonia (NH_3).

Particulate matter is expected to be created from both vehicle travel-created road dust and material handling (e.g. drop points, debagging, screening).

The OMCF feedstock streams contain organic and rapidly decomposable material such as food waste, leaves, grass, and trimmings. As such, composting operations are expected to emit POC, NPOC, and NH_3 emissions due to the physical aeration and biological composting processes.

POC emissions have not been assessed for S-65 (Pre-Processing Operation) as the material is not in a stockpile where the temperature of the material can rise and there is no moisture or aeration being added to commence the composting process. The material in the Pre-Processing Operation is being transferred and handled by various physical separation equipment such as screens and conveyors and POC emissions are not expected as part of this operation.

Hydrogen sulfide (H_2S) emissions would also be expected from the decomposition of organic materials. However, the facility has stated material will not remain in the stockpiles long enough for anaerobic conditions to exist and for reduced sulfur compounds to form. Therefore, H_2S emissions are assumed to be equal to zero.

Expected criteria air pollutants by source and operation are shown in Table 3 below.

Table 3. Expected Criteria Air Pollutants by Source

		Criteria Air Pollutant				
S-#	**Description**	**PM_{10}**	**$PM_{2.5}$**	**POC**	**NPOC**	**NH_3**
S-64	Organic Materials Stockpiles	**X**	**X**	**X**	**-**	**X**
	Stockpiles	-	-	X	-	X
	Vehicle Travel (road dust)	X	X	-	-	-
S-65	Pre-Processing Material Handling	**X**	**X**	**-**	**-**	**-**
	Front End Loader Batch Drop Transfer	X	X	-	-	-
	Conveyer Drop Points	X	X	-	-	-
	Debagging Operation	X	X	-	-	-
	Screening Operation	X	X	-	-	-
	Conveyor Transfers	X	X	-	-	
S-66	Rotary Drum Reactors # 1 & 2	**-**	**-**	**X**	**X**	**X**
S-67	Rotary Drum Reactors # 3 & 4	**-**	**-**	**X**	**X**	**X**
S-68	In-Vessel Composting Lanes 1 – 8	**-**	**-**	**X**	**X**	**X**
S-69	In-Vessel Composting Lanes 9 – 16	**-**	**-**	**X**	**X**	**X**
S-70	Post-Processing Material Handling	**X**	**X**	**-**	**-**	**-**
	Conveyor Drop Points	X	X	-	-	-
	Screening Operation	X	X	-	-	-
	Conveyor Transfers	X	X	-	-	-

Total emissions from each source include emissions that are captured, routed to an emissions abatement device, and exit an exhaust stack as well as emissions that are not captured. Emissions that are captured and abated are designated "controlled emissions" while non-captured emissions are designated "fugitive emissions".

Emissions from the project sources are estimated using the following equations:

$$\text{Total Emissions} = (\text{Controlled Emissions}) + (\text{Fugitive Emissions}) \quad \text{[Equation 1]}$$

$$\text{Controlled Emissions} = \left(\frac{\text{Capture Efficiency \%}}{100\%}\right) \times \left(\frac{100\% - \text{Control Efficiency\%}}{100\%}\right) \times (\text{Uncontrolled Emissions}) \quad \text{[Equation 2]}$$

$$\text{Fugitive Emissions} = \left(\frac{100\% - \text{Capture Efficiency \%}}{100\%}\right) \times (\text{Uncontrolled Emissions}) \quad \text{[Equation 3]}$$

$$\text{Uncontrolled Emissions} = (\text{Emission Factor}) \times (\text{Throughput}) \quad \text{[Equation 4]}$$

Where:

Total Emissions = total emissions generated by a source
Controlled Emissions = emissions after an abatement device (only includes what is captured and abated)
Fugitive Emissions = emissions not captured and routed to an abatement device
Capture Efficiency = capture efficiency of building
Control Efficiency = emissions reduction efficiency of an applicable abatement device
Emission Factor = emissions per activity unit (e.g. pounds of pollutant per ton of material usage)
Throughput = maximum activity on either a daily or annual basis

Capture Efficiency
A capture efficiency of 95 percent is assumed (see Appendix B for the basis of the assumption) for all sources and for all pollutants emitted from each source.

Control Efficiencies
The manufacturer of the proposed three acid scrubber/biofilter systems (A-7, A-9, A-11) has guaranteed that the biofilter control system will achieve a minimum of 90% control efficiency for VOCs and organic odorous compounds and 75% control efficiency for ammonia. These assumptions are consistent with the OMRF application and will be used in the calculations for this application. The proposed permit conditions require the owner/operator to verify the above control efficiency assumptions via District approved source testing. The biofilter source test for the OMRF is scheduled for 4th Quarter 2019.

At full buildout, the construction of the three biofilters between the IVC lane rooms (S-68 and S-69) with 28' high walls installed along the west and east ends and the Post-Processing building, will ensure the biofilters are surrounded with high walls on all four sides with their tops open to the atmosphere.

Each one of the five dust collectors (A-12 to A-16) is assumed to achieve at least 90% control efficiency for PM_{10} or smaller.

Emission Factors
Emission factors for each source were derived using either source test results or values or methodologies in either:

- Table III-1 of "ARB Emissions Inventory Methodology for Composting Facilities", March 2, 2015,
- Table 10.3-1 of U.S. EPA AP-42 (4th Edition), Section 10.3 Plywood Veneer and Layout Operations,
- Table 11.19.2-2 of U.S. EPA AP-42 (5th Edition), Section 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing,
- U.S. AP-42 (5th Edition), Section 13.2.2, Unpaved Roads, November 2006, or
- Table 13.2.4-1 of U.S. EPA AP-42 (5th Edition), Section 13.2.4 Aggregate Handling and Storage Piles, November 2006.

The derivation and basis for each emission factor used to estimate emissions is provided in Appendix C with derived emission factors listed in Table 4.

Table 4. Emission Factors by Source and Pollutant

		Emission Factor (lbs/ton)				
S-#	**Description**	**PM_{10}**	**$PM_{2.5}$**	**POC**	**NPOC**	**NH_3**
S-64	Organic Materials Stockpiles					
	Stockpiles	-	-	0.101	-	5.30E-04
	Vehicle Travel (road dust)(1)	1.978	0.198	-	-	-
S-65	Pre-Processing Material Handling					
	Front End Loader Batch Drop Transfer	5.71E-05	8.64E-06	-	-	-
	Conveyer Drop Points(2)	5.71E-05	8.64E-06	-	-	-
	Debagging Operation	1.44E-02	7.2E-03	-	-	-
	Screening Operation(3)	1.44E-02	7.2E-03	-	-	-
	Conveyor Transfers(4)	1.1E-03	3.1E-04	-	-	-
S-66	Rotary Drum Reactors # 1 & 2	-	-	3.58	1.68E-02	0.78
S-67	Rotary Drum Reactors # 3 & 4	-	-	3.58	1.68E-02	0.78
S-68	In-Vessel Composting Lanes 1 – 8	-	-	3.58	1.68E-02	0.78
S-69	In-Vessel Composting Lanes 9 – 16	-	-	3.58	1.68E-02	0.78
S-70	Post-Processing Material Handling					
	Conveyor Drop Points(2)	5.71E-05	8.64E-06	-	-	-
	Screening Operation(3)	1.44E-02	7.2E-03	-	-	-
	Conveyor Transfers(4)	1.1E-03	3.1E-04	-	-	-

Notes:
1. Emission factors are in units of pounds per vehicle mile traveled (lbs/VMT).
2. Emission factors are per conveyor drop point
3. Emission factors are per screener.
4. Emission factors are per conveyor transfer.

Using Equations 1 through 4, emissions for each source are estimated using the maximum throughputs listed in Table 1, the assumed capture and control efficiencies for each source, and the emission factors provided in Table 4.

Estimated maximum emissions of criteria air pollutants on both a daily and annual basis (after abatement) are shown in Table 5.

Table 5. Criteria Pollutant Emissions Estimates

		Daily Emissions (lbs/day)					**Annual Emissions** (lbs/year)				
S-#	**Description**	**PM_{10}**	**$PM_{2.5}$**	**POC**	**NPOC**	**NH_3**	**PM_{10}**	**$PM_{2.5}$**	**POC**	**NPOC**	**NH_3**
S-64	Organic Materials Stockpiles[(1)]	**1.5**	**0.1**	**25.1**	-	**0.3**	**534**	**54**	**3,196**	-	**40**
	Stockpiles	-	-	25.1	**-**	0.3	-	-	3,196	-	40
	Vehicle Travel	1.5	0.1	-	-	-	534	54	-	-	-
S-65	Pre-Processing Material Handling[(1)]	**12.5**	**4.9**	**-**	**-**	**-**	**2,720**	**1,060**	**-**	**-**	**-**
	Front End Loader Batch Drop Transfer	0.01	0.001	-	-	-	0.001	0.3	-	-	-
	Conveyer Drop Points	0.3	0.05	-	-	-	67	10	-	-	-
	Debagging Operation	2.1	1.0	-	-	-	456	228	-	-	-
	Screening Operation	4.2	2.1	-	-	-	911	456	-	-	-
	Conveyor Transfers	5.9	1.7	-	-		1,288	364	-	-	-
S-66	Rotary Drum Reactors # 1 & 2	**-**	**-**	**47.2**	**0.2**	**20.4**	**-**	**-**	**10,678**	**50**	**4,613**
S-67	Rotary Drum Reactors # 3 & 4	**-**	**-**	**47.2**	**0.2**	**20.4**	**-**	**-**	**10,678**	**50**	**4,613**
S-68	In-Vessel Composting Lanes 1 – 8	**-**	**-**	**188.6**	**0.9**	**81.5**	**-**	**-**	**42,712**	**201**	**18,451**
S-69	In-Vessel Composting Lanes 9 – 16	**-**	**-**	**188.6**	**0.9**	**81.5**	**-**	**-**	**42,712**	**201**	**18,451**
S-70	Post-Processing Material Handling[(1)]	**5.4**	**2.3**	**-**		**-**	**1,680**	**718**	**-**	**-**	**-**
	Conveyor Drop Points	0.1	0.01	-		-	27.0	4.1	-	-	-
	Screening Operation	3.6	1.8	-		-	1,135	567	-	-	-
	Conveyor Transfers	1.7	0.5	-		-	520	147	-	-	-
	Total (lbs/year)						**4,934**	**1,832**	**109,976**	**502**	**46,168**
	Total (tons/year)						**2.467**	**0.916**	**54.988**	**0.251**	**23.084**

Notes:
1. Listed totals differ from sum of individual equipment emissions due to rounding and number of significant figures shown.

CUMULATIVE INCREASE

The District tracks increases in emissions from each facility. These cumulative emissions were reset on April 5, 1991 for all facilities. This is an existing facility with pre-existing cumulative emissions. Cumulative emissions with this project are shown in Table 6.

Table 6. Cumulative Emission Increase Inventory (tons/year)

Pollutant	Current Balance	Proposed Equipment	Post-Project
PM_{10}	81.599	0.267 + 1.36E+00 + 8.41E-01 = 2.47	84.067
$PM_{2.5}$	0.000	0.027 + 5.29E-01 + 3.59E-01 = 0.915	0.915
POC	10.881	1.598 + 53.389 = 54.987	65.868
NO_x	5.904	0.000	5.904
SO_2	0.560	0.000	0.560
CO	1.459	0.000	1.459

STATEMENT OF COMPLIANCE

Regulation 1: General Provisions and Definitions

The facility is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. Although compost operations can be sources of odors, the proposed permit conditions are intended to prevent or abate odors before off-site issues arise. All organic material handling and compost operations will be controlled within an enclosed building and vented to a biofilter. For the proposed project, the District expects public nuisance issues to be minimized by the facility operating in compliance with the proposed permit conditions and any nuisance related issues will be responded to and handled promptly by the applicant in coordination with District staff.

Regulation 2, Rule 1: California Environmental Quality Act (CEQA) Requirements

This permit application is subject to an Initial Study for Davis Street Transfer Station Master Plan Improvements and a Negative Declaration (State Clearing House Number: SCH2010112069) previously prepared and adopted by the City of San Leandro.

The Air District has received the necessary information indicating that the City of San Leandro is acting as Lead Agency. Therefore, Regulation 2-1-426.2.3 has been complied with and the application was deemed complete for CEQA purposes.

In 1998, the City of San Leandro approved a Master Plan and issued a Conditional Use Permit that authorized Waste Management to accept up to 5,600 tons-per-day ("tpd") of waste materials. The same tonnage limit applies today. Among the approved uses was an organics management component, which included an organics recycling and onsite composting operation. Before approving the Master Plan, San Leandro adopted an Initial Study/Mitigated Negative Declaration (1998 IS/MND).

The City of San Leandro also adopted an Initial Study/Negative Declaration (IS/ND) for additional site improvements, including the OMCF, in 2011, after circulating the IS/ND for public review and comment. The purpose of the OMCF (or Organics Facility) was described in the IS/ND as being "to process certain waste streams using improved technologies and procedures to recover a higher yield of materials that can be diverted from landfills." The IS/ND identified and considered the potential effects of the OMCF, including from processing up to 1,000 tons per day of food and green wastes, along with other mixed organics, and including production of up to 350 tons/day of composted material onsite. The Solid Waste Facility Permit subsequently issued by the LEA with concurrence from CalRecycle also allows for the processing of up to 1000 tons per day of food and green waste, along with other mixed organics, and including production of up to 350 tons/day of composted material onsite. Though the stockpile (S-64) will have a permitted throughput of 1,711 tons per day and 218,200 tons per year, the stockpiled material will not be processed (like it would be in the case of the RDR/IVC). The material stockpiled represents the material received (and not processed). As is the case with S-64, the permitted throughput of the Post-

Processing Material Handling Operation (S-70) of 453.4 tons per day and 135,860 tons per year is not representative of the finished composted material exiting the OMCF which as discussed above cannot exceed 350 tons per day. Instead, S-70's throughput includes both finished composted materials and materials that are not compostable.

The IS/ND described the OMCF as receiving and handling waste within a 135,000 square-foot fully-enclosed building and under a negative air system to control potential odors and mitigate emissions. Operations would also comply with the conditions of the operable Solid Waste Facility Permit and new (2018) stringent state regulations governing composting. (See Cal Code Regs., tit. 14, §§ 17896.57 (digestate handling), 17896.58 (compost sampling requirements), 17896.59 (metal concentration limits), 17896.61 (physical contamination limits), 17868.3.1 (same), 17896.60 (pathogen reduction requirements).)

The IS/ND concluded the OMCF would not result in any reasonably foreseeable significant adverse effects on the environment. For instance, the IS/ND found that the facility would actually reduce truck transfer trips by approximately 8-10 trips per day over then existing baseline conditions because more organic waste would be composted onsite instead of trucked off-site for composting at another permitted facility. The IS/ND further found the Organics Facility would not result in any significant air quality impacts, in part, because of the applicant's compliance with conditions stipulated in the 1998 IS/MND (1998 conditions). Those conditions mandated that the entire operation occur in fully-enclosed buildings with biofilters to control dust and minimize odors.

The OMRF facility includes a biofilter to abate emissions of organic compounds and odors. Similarly, the OMCF includes three biofilters - one for abating emissions within the building and one each for each of the two sets of composting vessels. Furthermore, the facility's design allows for the expansion of the biofilters if more air emissions handling equipment is required during operations in the future.

The final action by the Air District is taken only after independent review and consideration of the information in the adopted IS/ND, as well as other evidence in the record as a whole regarding the OMCF and Authority to Construct permit. The Air District also independently considers whether any substantial evidence exists, in light of the whole record, triggering the need for additional environmental review pursuant to Public Resources Code section 21166 and CEQA Guidelines section 15162. The Air District preliminarily concludes that:

1. There is no substantial change proposed in the project which will require major revisions of the prior IS/ND due to the involvement of new significant environmental effects;
2. There have been no substantial changes which have occurred with respect to the circumstances under which the project would be undertaken which will require major revisions of the prior IS/ND due to the involvement of new significant environmental effects; and
3. There is no new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the prior IS/ND was adopted, including evidence showing:
   (A) The project will have one or more significant effects not discussed in the previous IS/ND.
   (B) Mitigation measures previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative.

(CEQA Guidelines, § 15162; Pub. Resources Code (PRC), § 21166.)

Regulation 2, Rule 1: School Public Notice Requirements

The public notification requirements of Regulation 2-1-412 apply to modifications which result in an increase in toxic air contaminant or hazardous air contaminant emission at facilities within 1,000 feet of the boundary of a K-12 school. The Applicant has reported no K-12 school within that radius of this facility, and the District's database confirms that there is no K-12 school within one mile from the facility. The website www.greatschools.org also confirms there is no K-12 school within one mile from the facility. Therefore, the school public notice requirements of this rule do not apply to this operation.

Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements
Regulation 2, Rule 2, Section 301 states that a new source shall require BACT to control emissions of a District BACT pollutant as defined in Regulation 2-2-210 if the source will have the potential to emit that pollutant in an amount of 10.0 or more pounds on any day as defined in Regulation 2-2-301.1. As shown in Table 5, POC emissions will exceed 10 pounds/day from S-64, S-66, S-67, S-68, and S-69. Therefore, BACT is triggered.

Stockpiling Operation S-64
The most common type of organic material stockpiling operation uses the open pile method. The material is processed by screening and separating the materials. The material is received and placed in stockpiles to prepare for processing.

The District conducted a review of the BACT Clearinghouses and BACT Guidelines from US Environmental Protection Agency, California Air Resources Board, and other Air Districts in the state of California. The District found no BACT guidelines for MSW stockpiling operations. Rainbow Disposal in Huntington Beach, CA is one transfer station with stockpiles that is fully enclosed served by carbon adsorption beds. However, this transfer station was enclosed and abated for odor purposes only. BACT was not triggered for this operation.

A literature review found that one type of control employed for storage piles is a limit on the duration of time that material resides in the stockpile before being processed. Under the SJVAPCD Rule 4566 for composting operations, stockpile storage time is limited to 10 days for operations processing less than 100,000 tons/year of material for composting and to 3 days for operations processing 100,000 tons/year or more. South Coast AQMD Rule 1133 for compost operations does not have any storage time limits for stockpiles. There are no other rules found for stockpile storage time limits. Since the proposed project will process more than 100,000 tons/year, it must meet a 3-day (72 hour) stockpile storage limit as a BACT control measure. Part 23 of permit condition 26859 will require the facility to process the stockpiles within 72 hours of receipt. Therefore, the stockpiles will satisfy BACT for best management practices.

A BACT analysis for stockpiles could use many of the same control technologies from a compost operation. However, in a compost operation, one of the primary requirements is pathogen control which is not a concern for stockpiling. Therefore, technologies such as aerated static piles or an in-vessel approach would not be applicable since the purpose of these technologies is pathogen control. However, use of similar organic compound control methodologies such as a biofilter would be a feasible control strategy. As shown in Table 7 below, the following are possible control options for a composting operation.

Table 7. Compost Operation Technology Rank by Control Effectiveness

Rank	Option
1	Positively aerated static piles with cover (cover is engineered, 12 inches of finished compost, or equivalent). (Active and Curing Phases)
1	In-vessel or container with aeration venting to biofilter or equivalent. (Active and Curing Phases)
1	Negatively aerated static piles with cover (cover is engineered, 12 inches of finished compost, or equivalent) venting to biofilter. (Active and Curing Phases)

As discussed above, the aerated static piles and in-vessel aeration are not options for stockpiling since pathogen reduction is not required. Capture of emissions and use of a biofilter to control the organic emissions from the MSW stockpiles will be considered the most effective BACT control technology for this class and category source.

The applicant has proposed the use of a fully enclosed building as the methodology to capture the organic emissions from the stockpiles. Engineered stockpile covers would also be a feasible capture technology. A total enclosure would be the most effective capture method.

Table 8. Stockpile Operation Technology Rank by Control Effectiveness

Rank	Option
1	Covered or Enclosed Stockpiles Venting to Biofilter

The District has two BACT levels: BACT1 and BACT2. A project must use BACT1 (the most stringent level of control) if it is found to be technologically feasible and cost effective. In accordance with the District's BACT/TBACT Workbook, the District's cost effectiveness thresholds are: $17,500/ton for POC, NPOC, and NO_X; $18,300/ton for SO_2; and $5,300/ton for PM_{10}. The District's BACT/TBACT Workbook also identifies the procedures to be used for conducting a cost effectiveness analysis. If emission controls do not meet the BACT1 criteria, the applicant must use BACT2, which is an achieved in practice level of control. BACT2 controls cannot be any less stringent than controls or emission limits that are required by any Air District, state, or federal rules or regulations.

For the proposed stockpiling operation, the proposed emission rate is greater than 10 lbs per day of POC. As discussed above, a total enclosure with a biofilter abatement device is expected to result in the highest potential capture and control efficiency for organic emissions. As required by the 1998 Conditions, the applicant has proposed the most effective control option. Therefore, a BACT cost effectiveness determination is not required.

The District finds that the S-64 stockpiling operation - with the POC emission limits and capture and control measures specified in the proposed permit conditions – satisfies BACT for POC control.

Compost POC BACT:
Composting is a biological decomposition process that converts biodegradable solid waste (such as lawn and garden waste, food waste, and other organic matter) into a stable material that is typically used as a soil amendment or fertilizer. Traditional composting uses aerobic (oxygen based) decomposition processes to breakdown the biodegradable material. Oxygen level, temperature, moisture, carbon to nitrogen ratio, material porosity, and other factors affect the rate of decomposition, quality of the product, and the emissions to the atmosphere.

The most common type of composting operation uses the open windrow compost method. The compost feedstock is prepared by shredding, grinding, and mixing the available materials to achieve a desired mix ratio. This shredded and mixed feedstock is placed in long stockpiles, called windrows, to start the active composting phase. Decomposition accelerates as the temperature increases. The desired oxygen levels are maintained in the windrow by frequently turning over the windrow using mechanical means. Once the active composting phase is complete, the windrows are allowed to rest and finish the composting process during a curing phase. This compost method requires a large work area, a large buffer zone between the facility and residents or industry, and a long time period to complete the compost process. This composting method typically has substantial fugitive particulate and organic emissions. Water sprays are commonly used to control particulate emissions, but organic emission controls are not typically employed.

Another type of composting process is the aerated static pile (ASP) process. Rather than placing the mixed feedstock in long windrows, the feedstock is placed in an area equipped with perforated pipes. Aeration is accomplished by blowing air into the pipes and through the feedstock (positive aeration), or the reverse, negative aeration, by pulling air through the feedstock and into the pipes. This aeration method typically requires less space and less total processing time than the traditional windrow method, but may still require large buffer zones and improves the oxygen control in the pile. It can also allow for greater flexibility in the type of feedstock processed. The ASP process eliminates the need for windrow turning, which is the largest source of particulate emissions for the windrow process. In addition, ASP process can easily be fitted with biofilters to control organic and ammonia emissions. Finished compost placed on top of the active compost curing piles acts as a biofilter for positive ASP. This type of ASP is often called a covered aerated static pile (CASP) process. Curing piles are typically handled similarly to the windrow process.

Another type of composting is the "in vessel" approach. This process may be used for sites that require a small footprint or that are in a more confined area. This type of system may be less adaptable with regards to types and amount of feedstock received. In-vessel composting equipment can be equipped with piping and biofilters to control organic and ammonia emissions. For in-vessel systems, the capture rates for organic and ammonia emissions are likely higher than the capture rates that can be achieved by the CASP process or a biofilter controlled negative ASP process. However, actual reported capture and control efficiencies for in-vessel systems vary widely and this range overlaps the ranges of capture and control efficiencies reported for CASP systems and biofilter controlled negative ASP systems. In addition, in-vessel system and control costs are considerably higher than for the CASP method.

Table 9. In-Vessel System Technology Rank by Control Effectiveness

Rank	Option
1	In-vessel or container with aeration venting to biofilter or equivalent. (Active and Curing Phases)
1a	Positively aerated static piles with cover (cover is engineered, 6 inches of finished compost, or equivalent). (Active and Curing Phases)
1b	Negatively aerated static piles with cover (cover is engineered, 6 inches of finished compost, or equivalent) venting to biofilter. (Active and Curing Phases)

As discussed above, in-vessel composting with biofilter abatement is a technologically feasible process that is expected to result in the highest potential control efficiency for organic emissions. As required by the 1998 Conditions, the applicant has proposed the most effective control option. Therefore, a BACT cost effectiveness determination is not required.

The BAAQMD has published a proposed BACT Guideline for composting green and food waste. The Guideline lists a proposed BACT2 Achieved in Practice control technology of Covered Aerated Static Pile (CASP) with biofilter, and either positive or negative aeration. As discussed above, the applicant has proposed an in-vessel composting operation with biofilter abatement which is considered as stringent as CASP with biofilter. Therefore, the application meets the BAAQMD BACT2 requirements.

South Coast Air Quality Management District Rule 1133.2 requires that new co-composting operations (composting with biosolids) be equipped with aeration systems and VOC controls, with new systems required to meet 80% VOC control and existing systems required to meet 70% VOC control. San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 4566 requires use of compost covers on windrows or other control measures achieving at least 60% control of VOC for certain types of non-agricultural commercial compost operations, if the compost operation has a throughput of > 200,000 tons/year of throughput but < 750,000 tons/year. For compost operations with throughput rates > 750,000 tons/year, SJVAPCD Rule 4566 requires 80% VOC Control. For composting operations, the SJVAPCD Rule 4566 control rates are the most stringent achieved in practice or BACT2 level of control that the District has identified to date.

The proposed project will have a lower throughput rate (205,700 tons/year) and a higher overall capture (95%) and control efficiency (90%) than would be required by the SJVAPCD Rule 4566 (60% control at 200,000 tons/year of throughput) for a compost operation. Therefore, the proposed controls for this compost project are at least as stringent as BACT2 controls for compost operations. Since the proposed project will have more stringent controls than BACT2, the District finds that the S-66, S-67, S-68, S-69 compost project - with the POC emission limits and control measures specified in the proposed permit conditions – satisfies BACT for POC control.

Regulation 2, Rule 2: Offsets

NO_X and POC

Per Section 2-2-302, POC and NO_X emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons per year or more on a pollutant specific basis. If the facility emits or will be permitted to emit less than 35 tons of POC or NO_X per year, the emission offsets may be provided by the District's Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC or NO_X, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

Since NO_X emissions from permitted sources at this site are less than 10 tons/year and there are no sources of NO_X emissions associated with the project, offsets are not required for NO_X emissions from this site.

Because POC emissions from this site are greater than 35 tons/year, offsets are required for the proposed application.

The POC offset requirements for this site and this application are summarized below.

Table 10. Required Emissions Offsets

Pollutant	Current Balance (tons/year)	Application Increases (tons/year)	New Balance (tons/year)	Offset Ratio	Offsets Required (tons/year)
POC	10.881	54.987	65.868	1.15	10.881 + (54.987 x 1.15) = 74.116

The applicant has indicated the required ERCs summarized in Table 10 will be purchased and ERC certificates will be surrendered to the District prior to issuance of the Authority to Construct permit.

PM_{10} and SO_2

Emission offset requirements for PM_{10} and SO_2 are defined in Regulation 2, Rule 2, Section 303. PM_{10} and SO_2 offsets are required for emission increases in excess of 1.0 ton per year since April 5, 1991 at a major facility. A major facility of regulated air pollutants is defined as a facility that has the potential to emit 100 tons per year or more of a regulated air pollutant. This plant is not a major source for PM_{10} or SO_2 and therefore, emission offsets for PM_{10} or SO_2 are not triggered.

Regulation 2, Rule 2: Prevention of Significant Deterioration (PSD)

Regulations 2-2-304 through 308 apply to PSD facilities. Sites belonging to one of the 28 PSD source categories listed in section 169(l) of the federal Clean Air Act have a PSD threshold of 100 tons/year for each regulated air pollutant and must include fugitive emissions when making a PSD major facility determination. However, sites that fall within unlisted categories (such as transfer stations and composting facilities) have a PSD major facility threshold of 250 tons/year for each regulated air pollutant and may exclude fugitive emissions when making this major facility determination. The maximum permitted/potential site-wide emissions will be less than 250 tons/year for each regulated air pollutant (POC, NOx, CO, PM_{10}, and SO_2). Therefore, this site is not a PSD major facility and is not subject to the PSD requirements in Sections 304-308.

Regulation 2, Rule 2: Major Modification

Section 2-2-218 defines Major Modification as a new source as defined in Section 2-1-232, or a modified source as defined in Section 2-1-234, or any combination of such new and modified sources at a facility that are part of a single common project, that (i) are or will be located at an existing major facility and (ii) will cause an increase in emissions of a pollutant for which the facility is a major facility, calculated according to Section 2-2-604, of the following amounts or more:

POC: 40 tons per year
NO_X: 40 tons per year
SO_2: 40 tons per year
PM_{10}: 15 tons per year
$PM_{2.5}$: 10 tons per year
CO: 100 tons per year

The increase in POC emissions is greater than the major modification thresholds. Therefore, this project is considered a major modification.

Regulation 2, Rule 5: Permits – New Source Review of Toxic Air Contaminants
Regulation 2, Rule 5, requires a health risk assessment (HRA) for new or modified sources if emissions estimates of any individual toxic air contaminant (TAC) exceeds either the acute or chronic emission trigger thresholds summarized in Table 2-5-1. If an HRA is triggered, related projects permitted within the previous three years must also be considered in the HRA analysis per Regulation 2-5-216. Hence, TAC emissions from Application # 28167 for the OMRF which was approved within the 3 years prior to the completeness date for OMCF Application # 29215 was included in the HRA.

Toxic Air Contaminants
TAC emissions from the staging pile operations at S-64 include NH_3 and certain organic compounds detected from a source test performed at a facility not owned/operated by Davis Street SMART on green waste and food waste stockpiles which include acetaldehyde, isopropanol, methanol, naphthalene, propylene, allyl chloride, carbon disulfide, vinyl acetate, methyl ethyl ketone, 1,2-dichloroethane, toluene, ethylbenzene, m & p-xylenes, styrene, and o-xylene.

TAC emissions from the Composting operations include NH_3 and certain organic compounds based on POC fractions identified in an article published by the University of California, Davis entitled "Volatile Organic Compound Emissions from Green Waste Composting: Characterization and Ozone Formation," which include isopropanol, methanol, naphthalene, propene, acetaldehyde, and acetone which is a non-TAC NPOC.

Stockpiling Operation (S-64)
The TAC emissions from the stockpile operations are based upon a source test performed on five green waste and three food waste uncontrolled stockpiles at a facility not owned/operated by Davis Street SMART.

For estimating potential emissions from the Pre-Processing staging piles, the emission factors of 0.101 lb/wet tons per day for POCs from the document entitled "ARB Emissions Inventory Methodology for Composting Facilities" and 5.30E-04 lb/wet tons per day for NH_3 determined from a source test performed on food waste stockpile at a facility not owned/operated by Davis Street SMART were used. Ammonia (which is both a criteria air pollutant and a TAC) emissions are estimated as described in the Emissions Section.

Table 11. Stockpile Emission Factors

	Emission Factor (lb/wet ton-day)		
Compounds	**Food Waste**	**Green Waste**	**Used in Evaluation**
TNMNEHCs	1.0E-01	5.0E-02	1.0E-01
Acetaldehyde	1.1E-03	2.5E-04	1.1E-03
Isopropyl Alcohol	8.2E-05	2.6E-05	8.2E-05
Methanol	5.8E-03	1.4E-02	1.4E-02
Naphthalene	1.1E-06	8.8E-07	1.1E-06
Propylene	7.4E-07	1.9E-05	1.9E-05
2 Butanone (MEK)	3.3E-04	5.1E-04	5.1E-04
Ammonia	5.3E-04	4.3E-04	5.3E-04
Allyl Chloride	Not Tested	3.0E-06	3.0E-06
Carbon Disulfide	Not Tested	3.5E-06	3.5E-06
Vinyl Acetate	Not Tested	1.5E-04	1.5E-04
Toluene	Not Tested	2.4E-05	2.4E-05
Ethylbenzene	Not Tested	1.4E-05	1.4E-05
m & p-Xylenes	Not Tested	6.7E-06	6.7E-06
o-Xylene	Not Tested	7.8E-06	7.8E-06
Styrene	Not Tested	3.4E-05	3.4E-05

To check if the hourly TAC emissions from S-64 exceeded their corresponding Acute TAC trigger levels in Table 2-5-1, the TAC emission factor used is the highest value from the food waste and green waste results summarized in Table 11. To check if the annual TAC emissions from S-64 exceeded their corresponding Chronic TAC trigger levels in Table 2-5-1, the TAC emission factor used is the average value from the food waste and green waste results summarized in Table 11.

Table 12. Toxic Air Contaminant Emissions from Stockpile Operation (S-64)

Compounds	Uncontrolled	Fugitive	Controlled	Fugitive + Controlled
Hourly Emissions (lbs/hour)				
Acetaldehyde	7.84E-02	3.92E-03	7.45E-03	1.14E-02
Isopropyl Alcohol	5.85E-03	2.92E-04	5.55E-04	8.48E-04
Methanol	9.98E-01	4.99E-02	9.48E-02	1.45E-01
Naphthalene	7.84E-05	3.92E-06	7.45E-06	1.14E-05
Propylene	1.35E-03	6.77E-05	1.29E-04	1.96E-04
Allyl Chloride	2.14E-04	1.07E-05	2.03E-05	3.10E-05
Carbon Disulfide	2.50E-04	1.25E-05	2.37E-05	3.62E-05
Vinyl Acetate	1.07E-02	5.35E-04	1.02E-03	1.55E-03
2 Butanone (MEK)	3.64E-02	1.82E-03	3.45E-03	5.27E-03
1,2-Dichloroethane	4.42E-04	2.21E-05	4.20E-05	6.41E-05
Toluene	1.71E-03	8.56E-05	1.63E-04	2.48E-04
Ethylbenzene	9.98E-04	4.99E-05	9.48E-05	1.45E-04
m & p-Xylenes	4.78E-04	2.39E-05	4.54E-05	6.93E-05
Styrene	2.42E-03	1.21E-04	2.30E-04	3.51E-04
o-Xylene	5.56E-04	2.78E-05	5.28E-05	8.06E-05
Ammonia	3.78E-02	1.89E-03	8.97E-03	1.09E-02
Annual Emissions (lbs/year)				
Acetaldehyde	1.47E+02	7.36E+00	1.40E+01	2.14E+01
Isopropyl Alcohol	1.18E+01	5.89E-01	1.12E+00	1.71E+00
Methanol	2.16E+03	1.08E+02	2.05E+02	3.13E+02
Naphthalene	2.16E-01	1.08E-02	2.05E-02	3.13E-02
Propylene	2.15E+00	1.08E-01	2.05E-01	3.12E-01
Allyl Chloride	6.55E-01	3.27E-02	6.22E-02	9.49E-02
Carbon Disulfide	7.64E-01	3.82E-02	7.26E-02	1.11E-01
Vinyl Acetate	3.27E+01	1.64E+00	3.11E+00	4.75E+00
2 Butanone (MEK)	9.16E+01	4.58E+00	8.71E+00	1.33E+01
1,2-Dichloroethane	1.35E+00	6.76E-02	1.29E-01	1.96E-01
Toluene	5.24E+00	2.62E-01	4.97E-01	7.59E-01
Ethylbenzene	3.05E+00	1.53E-01	2.90E-01	4.43E-01
m & p-Xylenes	1.46E+00	7.31E-02	1.39E-01	2.12E-01
o-Xylene	1.70E+00	8.51E-02	1.62E-01	2.47E-01
Styrene	7.42E+00	3.71E-01	7.05E-01	1.08E+00
Ammonia	1.05E+02	5.24E+00	2.49E+01	3.01E+01

Composting Operation (S-66, S-67, S-68, S-69)

The District estimated TACs in the POC emissions from composting operations using the TAC percentages of the total VOC provided in an article published by the University of California Davis entitled "Volatile Organic Compound Emissions from Green Waste Composting: Characterization and Ozone Formation".

Table 12. Toxic Air Contaminant Emissions from RDR Operation (S-66 and S-67)

Compounds	% VOC	Uncontrolled	Fugitive	Controlled	Fugitive + Controlled
Hourly Emissions (lbs/hour)					
Acetaldehyde	0.14	3.79E-02	1.90E-03	3.60E-03	5.50E-03
IPA	42.31	1.15E+01	5.73E-01	1.09E+00	1.66E+00
Methanol	12.79	3.46E+00	1.73E-01	3.29E-01	5.02E-01
Naphthalene	0.50	1.35E-01	6.77E-03	1.29E-02	1.96E-02
Propene	0.22	5.96E-02	2.98E-03	5.66E-03	8.64E-03
Ammonia	NA	5.90E+00	2.95E-01	1.40E+00	1.70E+00
Annual Emissions (lbs/year)					
Acetaldehyde	0.14	2.06E+02	1.03E+01	**1.96E+01**	2.99E+01

IPA	42.31	6.23E+04	3.12E+03	5.92E+03	9.04E+03
Methanol	12.79	1.88E+04	9.42E+02	1.79E+03	2.73E+03
Naphthalene	0.50	7.36E+02	3.68E+01	7.00E+01	1.07E+02
Propene	0.22	3.24E+02	1.62E+01	3.08E+01	4.70E+01
Ammonia	NA	3.21E+04	1.60E+03	7.62E+03	9.23E+03

Table 13. Toxic Air Contaminant Emissions from IVC Operation (S-68 and S-69)

Compounds	% VOC	Uncontrolled	Fugitive	Controlled	Fugitive + Controlled
Hourly Emissions (lbs/hour)					
Acetaldehyde	0.14	1.52E-01	7.58E-03	1.44E-02	2.20E-02
IPA	42.31	4.58E+01	2.29E+00	4.36E+00	6.65E+00
Methanol	12.79	1.39E+01	6.93E-01	1.32E+00	2.01E+00
Naphthalene	0.50	5.42E-01	2.71E-02	5.15E-02	7.86E-02
Propene	0.22	2.38E-01	1.19E-02	2.26E-02	3.46E-02
Ammonia	NA	2.36E+01	1.18E+00	5.61E+00	6.79E+00
Annual Emissions (lbs/year)					
Acetaldehyde	0.14	8.25E+02	4.12E+01	7.84E+01	1.20E+02
IPA	42.31	2.49E+05	1.25E+04	2.37E+04	3.61E+04
Methanol	12.79	7.53E+04	3.77E+03	7.16E+03	1.09E+04
Naphthalene	0.50	2.95E+03	1.47E+02	2.80E+02	4.27E+02
Propene	0.22	1.30E+03	6.48E+01	1.23E+02	1.88E+02
Ammonia	NA	1.28E+05	6.42E+03	3.05E+04	3.69E+04

Table 14. Total Toxic Air Contaminant Emissions from S-64, S-66, S-67, S-68, and S-69

	Total Project Emissions		Regulation 2, Rule 5 Thresholds	
Compounds	Hourly (lbs/hour)	Annual (lbs/year)	Acute (lbs/hour)	Chronic (lbs/year)
Acetaldehyde	3.89E-02	1.71E+02	1.0E+00	2.9E+01
Isopropyl Alcohol	8.31E+00	4.52E+04	7.1E+00	2.7E+05
Methanol	2.66E+00	1.40E+04	6.2E+01	1.5E+05
Naphthalene	9.82E-02	5.34E+02	NA	2.4E+00
Propylene	4.34E-02	2.35E+02	NA	1.2E+05
Allyl Chloride	3.10E-05	9.49E-02	NA	1.4E+01
Carbon Disulfide	3.62E-05	1.11E-01	1.4E+01	3.1E+04
Vinyl Acetate	1.55E-03	4.75E+00	NA	7.7E+03
2 Butanone (MEK)	5.27E-03	1.33E+01	2.9E+01	NA
1,2-Dichloroethane	6.41E-05	1.96E-01	NA	4.0E+00
Toluene	2.48E-04	7.59E-01	8.2E+01	1.2E+04
Ethylbenzene	1.45E-04	4.43E-01	NA	3.3E+01
m & p-Xylenes	6.93E-05	2.12E-01	4.9E+01	2.7E+04
o-Xylene	8.06E-05	2.47E-01	4.9E+01	2.7E+04
Styrene	3.51E-04	1.08E+00	4.6E+01	3.5E+04
Ammonia	8.49E+00	4.62E+04	7.1E+00	7.7E+03

As shown in Table 14, hourly isopropyl alcohol and ammonia, and annual acetaldehyde, naphthalene, and ammonia emissions exceed their respective Acute and Chronic TAC trigger levels in Table 2-5-1. Therefore, a health risk assessment (HRA) is required for this project.

The HRA estimated the health risk resulting from TAC emissions associated with the new Organics Material Composting Facility (OMCF). As previously stated, in accordance with Regulation 2-5-216, the HRA also evaluated as part of the "project" the Organics Material Recovery Facility (OMRF) which was reviewed under Application 28167. The health impacts from this project are summarized in Table 15.

Table 15. Project OMCF Health Risk Assessment Results

		Hazard Index	
Receptor	Cancer Risk	Chronic	Acute
Resident	1.8	0.012	N/A
Worker	0.56	0.044	N/A
PMI (1-hour)	N/A	N/A	0.93

All emission sources included in the application are located inside buildings assumed to have capture efficiencies of 95%. Captured organic compounds are to be treated in Acid Gas Scrubber/Biofilter abatement systems assumed to be 90% efficient at removing VOCs. This 95% capture and 90% control combination is considered TBACT for composting and compostable material handling operations. Therefore, 5% of project TAC emissions were modeled as fugitive emissions.

Project health risks are less than the Regulation 2-5-302 limits of 10 in a million cancer risk, 1.0 chronic HI, and 1.0 acute HI. Therefore, this project satisfies all toxic NSR requirements.

PM_{10}

The PM_{10} emissions from the stockpiling, handling, and processing operations are not expected to generate any significant toxic emissions. PM_{10} emissions from these sources are mainly dust from entrained soil or small amounts of wood, materials that are generally non-toxic and the compounds listed in Table 2-5-1 are not expected to be contained in the soil or wood processed at S-64 to S-70.

Major Facility Review, Regulation 2, Rule 6
40 CFR Part 70, State Operating Permit Programs (Title V)

This facility is not subject to MFR Permit requirements pursuant to Regulation 2-6-301, because it does not have the potential to emit more than 100 tons per year of any regulated air pollutant and it is not major for HAPs.

Though isopropanol emissions are greater than 10 tons/year, it is not on the EPA HAP list. Therefore, this plant is not a major source of HAPs.

Regulation 6, Rule 1: Particulate Matter – General Requirements

The facility is expected to comply with Regulation 6-1-311 General Operations based on the calculated emission levels shown below. The process rate for all operations will exceed 26,000 kg/hr. This equates to an emission rate not to exceed 18.1 kg/hour or 40.0 lbs/hr.

Material processing operations and maximum emission rates are listed below. While the facility is permitted to operate 24 hours/day, processing will normally be completed within 12-16 hours. As a worst case estimate of hourly emissions, the District will assume 12 hours of processing for the sources below.

Source	Emissions		
S-65	12.5 lbs/day (see Table 5)	=	1.04 lbs/hour
S-70	5.4 lbs/day (see Table 5)	=	0.45 lb/hour

Emissions from each source above will not exceed 40 pounds/hour. Therefore, the sources in this project comply with the requirements of Regulation 6-1-311.

Total particulate emissions from the OMCF building is estimated to be 19.4 pounds/day ((0.267 tons/year x 2000 / 365) + 12.5 + 5.4) of PM_{10}. The exhaust rate through the biofilter is about 48,000 cfm. The grain loading in the building exhaust is estimated to be:

(19.4 pounds/day)/(12 hours/day)/(60 mins/hour)*(7000 grains/pound)/(48,000 ft^3/min) = 0.004 gr/standard ft^3

The maximum estimated grain loading from the building is below the Regulation 6-1-310 limit of 0.0425 gr/dscf. Therefore, compliance with Regulation 6-1-310 is expected.

The District's Compliance and Enforcement staff will verify compliance with Regulation 6-1 standards during their routine inspections.

Regulation 7, Rule 1: Odorous Substances
This material recovery facility operation is not expected to be subject to this regulation per exemption 7-110.4 "Materials possessing strong odors for reasons of public health and welfare, and where no suitable substitute is available and where best modern practices are employed". A material recovery facility operating within an enclosed building with abatement by a biofilter meets the requirements of best modern practices which is consistent with the determination made for the OMRF application. The proposed permit conditions will ensure best modern practices are employed.

Regulation 8, Rule 2: Miscellaneous Operations
Regulation 8-2-301 states:
"A person shall not discharge into the atmosphere from any miscellaneous operation an emission containing more than 6.8 kg. (15 lbs.) per day and containing a concentration of more than 300 PPM total carbon on a dry basis."

The source testing required by the proposed permit conditions will help demonstrate compliance with Regulation 8-2-301 standards.

Regulation 9, Rule 2: Inorganic Gaseous Pollutants – Hydrogen Sulfide
Regulation 9-2-301 states:
"A person shall not emit during any 24 hour period, hydrogen sulfide in such quantities as to result in ground level concentrations in excess of 0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes."

Hydrogen sulfide is generally identified by its characteristic rotten egg smell and can be detected by its odor at concentrations as low as 0.0005 ppmv. Therefore, H_2S emissions are usually detected by smell well before the concentrations approach the limits in Section 9-2-301. The applicant does not expect reduced sulfur compounds to form as the materials will not remain in stockpiles long enough for anaerobic conditions to exist. As hydrogen sulfide complaints are not expected for this plant, area monitoring to demonstrate compliance with this rule is at the discretion of the APCO.

Permit Conditions
Permit Condition # 26859

1. The owner/operator shall abate emissions from the stockpiling operation (S-64) with the properly installed, properly maintained, and properly operated Dust Collector DC-1 (A-12) and the properly installed, properly maintained, and properly operated Acid Gas Scrubber and Biofilter #2 (A-7) at all times of operation. (Basis: BACT)

2. The owner/operator of S-64 shall ensure that no more than 1,711 tons of material is stockpiled in any day and no more than 218,200 tons of material is stockpiled at (S-64) during any consecutive 12-month period. (Basis: Cumulative Increase)

3. The owner/operator shall abate emissions from the pre-processing operation (S-65) with the properly installed, properly maintained, and properly operated Dust Collector DC-1 (A-12) and the properly installed, properly maintained, and properly operated Acid Gas Scrubber and Biofilter #2 (A-7) at all times of operation. (Basis: BACT)

4. The owner/operator of S-65 shall ensure that no more than 1,000 tons of material is processed in any day and that no more than 218,200 tons of material is processed at the pre-processing operation (S-65) during any consecutive 12-month period. (Basis: Cumulative Increase)

5. The owner/operator shall abate emissions from the Rotary Drum Reactors #1 through #4 (S-66 and S-67) with the properly installed, properly maintained, and properly operated Acid Gas Scrubber and Biofilter #2 (A-7) at all times of operation. (Basis: BACT).

6. The owner/operator shall abate emissions from the In-Vessel Composting Lanes #1 through #8 (S-68) with the properly installed, properly maintained, and properly operated Acid Gas Scrubber and Biofilter #3 (A-9) at all times of operation. (Basis: BACT).

7. The owner/operator shall abate emissions from the In-Vessel Composting Lanes #9 through #16 (S-69) with the properly installed, properly maintained, and properly operated Acid Gas Scrubber and Biofilter #4 (A-11) at all times of operation. (Basis: BACT)

8. Upon completion of Phase 1 of the project (installation of IVC operation lanes 1-8), the owner/operator shall ensure that no more than 454 tons of material is processed at the RDR and IVC operations (S-66 and S-68) in any day and that no more than 102,850 tons of material is processed at the RDR and IVC operations during any consecutive 12-month period. Upon completion of Phase 2 of the project (installation of IVC operation lanes 9-16), the owner/operator shall ensure that no more than 908 tons of material is processed at the RDR and IVC operations (S-66, S-67, S-68, S-69) in any day and that no more than 205,700 tons of material is processed at the RDR and IVC operations during any consecutive 12-month period. (Basis: Cumulative Increase)

9. The owner/operator shall abate emissions from the post-processing operation (S-70) with the properly installed, properly maintained, and properly operated Dust Collectors DC-2 (A-13), DC-3 (A-14), DC-4 (A-15), and DC-5 (A-16) at all times of operation. (Basis: Regulation 2-1-403)

10. The owner/operator of S-70 shall ensure that no more than 435.4 tons of material is processed in any day and that no more than 135,860 tons of material is processed at the post-processing operation (S-70) during any consecutive 12-month period. (Basis: Cumulative Increase)

11. Mixed waste to be used as compost feedstock is commercial and residential source separated organics, agricultural organics residue, and the organic fraction separated from residential, commercial and multi-family MSW and may

include but not limited to inert, paper, green waste (such as yard trimmings, untreated wood wastes, and natural fiber products), source separated food waste (such as food scraps, food waste, and compostable food packaging or serving materials), and mixed green waste (yard trimmings commingled with food waste). The compost feedstock may not include any biosolids, animal wastes, or poultry litter other than incidental amounts from residential or commercial streams. Food waste may not include any pomace or liquid wastes from commercial food or beverage processing operations, other than incidental amounts from residential or commercial streams. Annual food waste shall not exceed 40% by weight of the total compost feedstock. The amount of food waste shall be calculated as the sum of food waste contained in the source separated food waste plus the amount of food waste in the mixed green waste accepted in a calendar year. The food waste percentage shall be calculated as the total amount of food waste accepted in a calendar year, divided by the total mixed waste compost feedstock received in that calendar year. An annual waste characterization study will be performed as described in Part 15 to demonstrate compliance with this limit. Records of source separated residential and commercial organic feedstock and mixed waste organic feedstock delivery shall be maintained in a District-approved log.
(Basis: Cumulative Increase and Offsets)

12. The owner/operator shall process all material received at S-64 within 72 hours of receipt. Material shall not be stockpiled outside of the OMCF building. The owner/operator shall perform daily odor monitoring of the compost piles and stockpiles as applicable and maintain records of the corrective measures undertaken if adverse odors are found. Any material that is deemed to be odorous by a District inspector shall be removed within 12 hours. Records of the quantity and method of disposal shall be maintained.
(Basis: BACT, Cumulative Increase, and Regulation 1-301)

13. The owner/operator shall submit a Best Management Practices (BMP) manual for District review/approval within 120 days of conducting the District approved initial source test of Part 29 and any updates to the BMP (if applicable) within 60 days following subsequent District approved source testing. The owner/operator shall use the BMP for the compost operations to ensure that the composting systems are operating as designed and to prevent negative impacts on air quality. The owner/operator shall ensure the BMP manual includes the following requirements, at a minimum:

a. The owner/operator shall ensure that the compost feedstock is incorporated into the compost operation within the timeframe allowed in Part 12.
b. Manufacturer-recommended maintenance of the blowers associated with the compost operation. A backup motor shall be maintained onsite in case of failure or maintenance of the primary blower.
c. All blower downtime due to breakdown or maintenance shall be recorded. For blower downtime in excess of 24 consecutive hours, monitoring shall be performed per the BMP's to demonstrate that the composting process is operating as designed and results recorded in a District-approved log.
d. Identify the minimum and maximum range of moisture content for the biofilters.
e. Specifications of the ideal operating temperature range for the IVC operations (S-68 and S-69). Specifications for operation and maintenance of the automated temperature monitoring and recording system. Daily monitoring of compost temperatures as applicable and corrective measures if needed.
f. Specifications for moisture content and oxygen levels of the compost feedstock in the compost operation. Monitoring, recording, and corrective measures to ensure maintenance of the moisture and oxygen levels.
g. Daily odor monitoring of the entire composting operation as applicable. Records of corrective measures undertaken if odors are found.
h. Specifications of and records of all on-going monitoring and maintenance of piping and blowers to prevent and repair cracks, leaks, plugging, and channeling.

The owner/operator shall maintain on-site a District-approved written set of BMP's, identifying the monitoring and other operational standards. Where applicable, the owner/operator shall provide any updates to the District-approved BMP on a quarterly basis. The quarterly updates to the BMP shall substantiate what change(s) were made and provide the supporting rationale. The District shall review and provide comments to the proposed revisions to the BMP within 30-calendar days of receipt. The owner/operator shall respond to the District's comments within 30-calendar days. Once approved, the revised BMP shall be the District's approved BMP until the next update. (Basis: Cumulative Increase, Offsets, Regulation 2-1-403)

14. The owner/operator shall ensure that the moisture content of the feedstock material placed into the IVC (S-68 and S-69) shall be monitored and recorded as required in the BMP manual required in Part 13. The moisture content of the material sent from the RDR (S-66 and S-67) to the IVC (S-68 and S-69), the material processed in the IVC in the lanes being turned, and the finished compost exiting the IVC shall be monitored and recorded daily as applicable. During the startup period, the owner/operator shall measure the moisture content of the material harvested from the areas as outlined in this Part to evaluate the adequacy of the feedstock moisture content and report the results of this monitoring to the District on a monthly basis to demonstrate the adequacy of the minimum moisture content. (Basis: Cumulative Increase, Offsets, Regulations 2-1-320, 2-1-403)

15. The owner/operator shall monitor the temperature and oxygen in the IVC (S-68 and S-69) on a continuous basis as documented in the BMP of Part 13. If the monitored temperature or oxygen is outside of the guidelines identified in the BMP, the owner/operator shall notify the District and take immediate corrective action. The owner/operator shall ensure the temperature monitoring system adjusts the air flow into the IVC as needed to maintain compost temperature as defined in the BMP. The owner/operator shall record blower downtime, the cause, and monitoring results. (Basis: Cumulative Increase, Offsets, Regulation 2-1-403)

16. The owner/operator shall ensure that compost feedstock is maintained in an active properly operated and properly aerated compost operation for at least 2.5 days in the RDR operation (S-66 and S-67) and for at least 19 days in the IVC operation (S-68 and S-69). To demonstrate the composting process is complete, the owner/operator shall monitor the temperature of the final compost stockpile on a weekly basis and shall ensure the temperature does not exceed 122 degrees Fahrenheit.
(Basis: Cumulative Increase, Offsets, Regulation 2-1-403)

17. In order to demonstrate compliance with Part 11, the owner/operator shall conduct an annual waste characterization study of residential and commercial source separated organics within the OMCF building to identify the percentage of food waste in the compost feedstock consistent and in conformance with Cal Recycle and/or District approved methodology. If the percentage is found to be greater than 40% then a subsequent compliance demonstration test shall be performed within 180 days. (Basis: Cumulative Increase, Offsets)

18. The owner/operator shall ensure that all material that has the potential to cause putrescible odors is processed and stored within the OMCF building that is achieving at least 95% capture of organic and particulate emissions. Compliance with the 95% capture efficiency is assured by the design of the building ventilation system, which will operate under negative pressure. Within 120 days of start-up of these operations, the owner/operator shall demonstrate that the ventilation system within the OMCF building is performing as designed by demonstrating that the ventilation system is achieving a minimum of 35,000 cubic feet per minute (CFM) exhausted to the A-7 acid scrubber/biofilter, a minimum of 48,000 CFM exhausted to the A-9 acid scrubber/biofilter, and a minimum of 48,000 CFM exhausted to the A-11 acid scrubber/biofilter.

    To confirm the minimum exhaust flow, the owner/operator shall utilize an Associated Air Balance Council (AABC) licensed and certified third-party test and balance company (TAB) which will use procedures defined in the current AABC National Standards for Total System Balance, Seventh Edition 2016, an ANSI-approved standard, to certify system balance and confirm that the exhaust design criteria is being achieved. Measurements and calculations will be provided for the following ventilation scenarios: with roll up doors closed and with roll up door open (louvers/fans functioning per design). The owner/operator will submit the certified test and balance reports to BAAQMD within 60 days of completion of the test.
    (Basis: BACT, Cumulative Increase, Regulations 1-301 and 2-1-320)

19. Upon completion of Phase 1 of the project (installation of IVC operation lanes 1-8), the owner/operator shall ensure that the stockpiles (S-64), pre-processing operation (S-65), post-processing operation (S-70), and RDR operation (S-66) are abated by A-7 acid scrubber/biofilter system, the IVC operation lanes 1-8 (S-68) is abated

by A-9 acid scrubber/biofilter system. The owner/operator shall ensure that the emissions from the A-7 biofilter exhaust do not exceed any of the following limits: 13,874 pounds of precursor organic compounds (POC), and 4,646 pounds of ammonia (NH3), during any consecutive rolling 12-month period. The owner/operator shall ensure that the emissions from the A-9 biofilter exhaust do not exceed any of the following limits: 42,712 pounds of POC, and 18,451 pounds of NH3, during any consecutive rolling 12-month period. On a monthly basis, the owner/operator shall calculate and record POC and NH3 emission rates for each month and for each rolling 12-month period using operating time data recorded and hourly emission rates measured. (Basis: BACT, Cumulative Increase, and Regulations 1-301, 2-1-403, 2-5-302, and 7-1)

20. Upon completion of Phase 2 of the project (installation of IVC operation lanes 9-16), the owner/operator shall ensure that the stockpiles (S-64), pre-processing operation (S-65), post-processing operation (S-70), and RDR operations (S-66 and S-67) are abated by A-7 acid scrubber/biofilter system, the IVC operation lanes 1-8 (S-68) is abated by A-9 acid scrubber/biofilter system, and the IVC operation lanes 9-16 (S-69) is abated by A-11 acid scrubber/biofilter system. The owner/operator shall ensure that the emissions from the A-7 biofilter exhaust do not exceed any of the following limits: 24,552 pounds of precursor organic compounds (POC), and 9,259 pounds of ammonia (NH3), during any consecutive rolling 12-month period. The owner/operator shall ensure that the emissions from the A-9 biofilter exhaust do not exceed any of the following limits: 42,712 pounds of POC, and 18,451 pounds of NH3, during any consecutive rolling 12-month period. The owner/operator shall ensure that the emissions from the A-11 biofilter exhaust do not exceed any of the following limits: 42,712 pounds of POC, and 18,451 pounds of NH3, during any consecutive rolling 12-month period. On a monthly basis, the owner/operator shall calculate and record POC and NH3 emission rates for each month and for each rolling 12-month period using operating time data recorded and hourly emission rates measured. (Basis: BACT, Cumulative Increase, and Regulations 1-301, 2-1-403, 2-5-302, and 7-1)

21. The owner/operator shall ensure that Biofilters A-7, A-9, and A-11 are each equipped with properly operating moisture systems (such as humidifiers and sprinklers) and that each of these systems is used as needed to maintain optimum biofilter media moisture content. Upon initial operation, the owner/operator shall visually check the biofilter, on a weekly basis, for compaction, channeling (cracks), or noticeable increase in detectable odors, and shall take action to correct any noticeable problems within 3-calendar days. Within 180 days of initial operation, the owner/operator shall establish the optimum operational ranges for scrubber/biofilter operation in the BMP manual as required under Part 13.

After 180 days of operation, the owner/operator shall operate all biofilters within the established optimal operating ranges documented in the BMP. For the purposes of testing and monitoring, the biofilter surface shall be divided into uniformly sized grids. A parameter shall be deemed to be operating in compliance with the established operating parameter range if the average value for all grids measured is within the established optimal operating parameter range and no more than 25% of the grids measured have a parameter that is out of the established operating parameter range. If one/more biofilter monitoring parameters i.e., pH, moisture content, temperature, discharge pressure, and any others, are determined to be operating out of the established optimal operating parameter range for more than 25% of the grids, the applicant shall initiate, within 3-calendar days, the required maintenance to return the grid back to the established optimal operating range. To demonstrate compliance with this requirement, the owner/operator shall monitor and record the biofilter exhaust blower discharge pressure, on a monthly basis. The owner/operator shall monitor biofilter media temperature, on a monthly basis, by inserting a manual temperature probe into each biofilter grid location, waiting for the temperature to stabilize, then recording the temperature. Biofilter filter moisture and pH shall be tested on at least a quarterly basis.

When source testing the biofilter, the owner/operator shall establish the minimum number of representative grid points. Samples of the biofilter media shall be taken at a depth of at least two feet below the media surface and measured for pH, moisture content, and temperature. Samples shall be received at a laboratory within 48 hours of collection. After collection of biofilter media samples, any sample holes shall be re-filled immediately with the excavated material.

The biofilter media shall be replaced every two to five years as recommended by the manufacturer to maintain operating parameters within the normal operating ranges or as dictated by the condition of the media that will enable operating parameters to be within their normal operating ranges.
(Basis: BACT, Cumulative Increase and Regulation 1-301)

22. The owner/operator shall maintain records of the volume of water injected into biofilters A-7, A-9, A-11 on a weekly basis. (Basis: BACT and Cumulative Increase)

23. Visible dust emissions from any operation occurring outside the building housing these sources (S-64 through S-70) and/or their associated abatement devices shall not exceed Ringelmann 1.0 or result in fallout on adjacent property in such quantities as to cause a public nuisance per Regulation 1-301. To ensure compliance with this Part, the owner/operator shall visually observe all OMCF-related material handling operations around the OMCF building by following applicable procedures in Regulation 6-1-601 and shall immediately initiate corrective actions, if any visible dust emissions are detected that persist for longer than 3 minutes in an hour. (Basis: Regulations 1-301, 6-1-601, 6-1-301 and 6-1-305)

24. Dry, dusty material shall be wetted down before unloading from truck beds, as necessary to comply with Part 23. The owner/operator shall ensure that the pre-processing operation is vented to A-12 dust collector with fabric filters (baghouse) and the post-processing operation is vented to A-13, A-14, A-15, A-16 baghouses, with exhaust from the baghouses exhausted back into the building. The owner/operator shall meet all the following requirements to ensure that the baghouses (A-12 through A-16) are properly operated and maintained.

a. The owner/operator shall clean the baghouse filter bags and empty the particulate collection hoppers at regular intervals in accordance with the manufacturer's instructions to ensure proper operation of the baghouse.
b. The owner/operator shall equip each baghouse with a device that measures pressure drop across each baghouse. The owner/operator shall monitor the pressure drop across each baghouse on a weekly basis. If the pressure drop across any baghouse is lower than 2 inches of water or greater than 12 inches of water; the owner/operator shall immediately initiate inspection and maintenance of the affected baghouse to correct the problem.
c. In addition to weekly pressure drop monitoring, the owner/operator shall inspect the baghouses and filter bags on a quarterly basis for evidence of particulate emissions breakthrough and the need for filter bag replacement. If any of the following are observed: visible particulate emissions in the plume, dust buildup near the baghouse exhaust outlet, abnormal pressure drops, or filter bag tears, holes, or abrasions, the owner/operator shall immediately conduct maintenance on the baghouse to correct the problem.

(Basis: BACT and Cumulative Increase and Regulations 6-1-301, 6-1-310, 6-1-311, and 2-1-403)

25. The owner/operator shall develop and maintain a District approved odor management plan (OMP) detailing all processes and procedures, equipment, management practices, abatement and control measures that are employed or are scheduled to be implemented to minimize fugitive emission of odors. The owner/operator shall submit a proposed OMP at least 90 days prior to initial startup. If the APCO determines that the proposed OMP is not satisfactory, the APCO will notify the owner or operator in writing of any deficiencies within 30 days. The owner/operator shall correct the identified deficiencies and resubmit the proposed OMP within 45 days. If the APCO determines that the owner or operator failed to correct any deficiency identified in the notification, the APCO will disapprove the OMP. The owner/operator shall revise and continue to re-submit the OMP for APCO review until it is approved. The APCO will approve the corrected OMP if it is determined that the plan meets the requirements of this permit and shall provide written notification of its decision to the owner or operator within 30 days of receipt of the OMP from the owner/operator. The owner/operator shall update the OMP as needed to address any confirmed odor complaints and shall submit an updated OMP to the APCO within 45 days of notification by the APCO. The updated OMP shall be made available for District inspection upon request. The updated OMP shall be certified and signed by a Responsible Manager and shall include, but not be limited to:

a. Table of Contents
b. Company Description
c. Company Organizational Chart and Schedule of Management Operators
d. Description of Facility Operations
e. Management Practices to Reduce Odors. A description and evaluation of odor prevention measures.
f. Description of Abatement and Control Equipment
g. Technical Data that includes a Process Flow Diagram and Facility Layout/Floor Plan that provides a complete description of facility operations, including locations of all processing equipment (exempt and permitted equipment) and associated monitoring and control equipment.
h. Description of all Employee Training to minimize odors and frequency of any ongoing training.
i. A description of the equipment, processes and procedures installed or implemented within the last 5 years to reduce emissions, including the year of installation for each device.
j. A description and schedule of future plans to implement additional odor reduction measures.
k. Information pertinent to the process operating parameters requested by the APCO as necessary to enable determination of compliance with applicable provisions of this permit.

Failure to implement and maintain equipment, processes, procedures or odor prevention measures in accordance with the APCO approved OMP is a violation of this permit.
(Basis: Regulation 1-301)

26. The owner/operator shall employ best management practices for housekeeping and maintenance at the standards identified in the OMP of Part 25 to reduce the quantity of odorous material not being used as feedstock. Good housekeeping shall include maintaining all outside work areas and outdoor pavement associated with this facility, by removing material including, but not limited to, debris or sludge, to the extent feasible. Leachate shall be collected, handled, and disposed of in accordance with best management practices. (Basis: BACT and Regulation 1-301)

27. All bays and doorways shall be maintained in good working order and shall be closed at all times except when material is being transferred in and out or for maintenance and operational access. The owner/operator shall use any method available to minimize building air from being released to the atmosphere. (Basis: BACT, Cumulative Increase, Regulation 1-301)

28. All roadways associated with this facility shall be maintained in a clean or wetted condition. When on-site, all vehicles hauling odoriferous or material that may produce particulate emissions shall be enclosed/tarped and the material shall remain covered at all times while in the vehicle except during loading and unloading of material into the vehicle, and/or while being transported between buildings on site or to the designated tarping area. All refuse trucks shall be maintained in condition to prevent leakage of solid or liquid material. Trucks shall be cleared of any debris to minimize nuisance emissions. (Basis: Regulation 1-301 and Regulation 6-1-305)

29. Within 180 days of initial start-up of Phase 1 and Phase 2, the owner/operator shall ensure that a District approved source test is conducted at biofilters A-7, A-9, and A-11 to demonstrate compliance with emission limits in Parts 19 and 20, and annually thereafter. The source test on the biofilters shall measure methane, ethane, total non-methane organic compounds, acetaldehyde, isopropyl alcohol, methanol., naphthalene, propylene, allyl chloride, carbon disulfide, vinyl acetate, 2-butanone, 1,2-dichloroethane, toluene, ethylbenzene, m & p-xylenes, styrene, o-xylene, and ammonia in the exhaust from A-7, A-9, and A-11. The owner/operator shall use EPA Method TO-15 to perform the toxic air contaminant source testing. Emissions averaged over the test period shall be expressed in units of pounds per hour and pounds per wet ton where wet ton is the throughput fed to the source being abated by the biofilter. The source tests shall be conducted while the sources in the OMCF are operating under conditions representative of normal operations. The owner/operator shall document the following operating parameters during times of biofilter testing: biofilter air flow rate, blower exhaust discharge pressure, biofilter media temperature, moisture content and pH. Samples for pH, moisture content, and temperature of the biofilter media shall be measured at a depth of at least two feet below

the media surface. The owner/operator shall retest the biofilters to demonstrate compliance with Parts 19 and 20 of this permit condition within 120 days of replacing more than 50% of the biofilter media.
(Basis: BACT and Cumulative Increase)

30. At least 90 days prior to conducting any source testing required by Part 29 of this permit condition, the owner/operator shall submit a source test protocol to the District Permit Engineer and to the Manager of the Source Test Section that will demonstrate compliance with Parts 19 and 20. At least 14 days prior to the scheduled test date, the owner/operator shall obtain approval of the source test protocol from the Manager of the Source Test Section. At least 7 days prior to the scheduled test date, the owner/operator shall notify the District Permit Engineer and the Manager of the Source Test Section of the scheduled test date. Source testing shall be conducted using methods and procedures approved by the District. Within 60 days of completing the source test, the owner/operator shall submit the results of these tests to the Manager of the Source Test Section and to the District Permit Engineer. (Basis: BACT and Cumulative Increase)

31. If the facility receives more than 2 Notices of Violation (NOVs) for "public nuisance" from the District in any consecutive 12-month period and the OMCF is confirmed to be the source of the nuisance odors, the owner/operator shall consult with the District regarding appropriate odor control measures, receive District approval regarding necessary odor control measures, and commit to implementation timelines. Odor control measures may include one or more of the measures suggested in the OMP or other measures agreed upon by the owner/operator and the District. The owner/operator shall update the OMP and submit the plan for APCO approval within 60-days of receiving the NOVs. If notified by the District, the owner/operator shall submit a permit application to the District to modify the Permit to Operate and/or this permit condition within a reasonable time frame mutually agreed upon between the District and applicant.
(Basis: Regulations 1-301 and 2-1-403)

32. The owner/operator shall maintain the following records:
    a. On a daily basis: Documentation of the amount of material received at each source at the OMCF as applicable (S-64, S-65, S-66, S-67, S-68, S-69, S-70) and processing times for putrescible materials and operating hours as needed to demonstrate compliance with the throughput, processing time, and emissions limits.
    b. On a monthly basis: Summarize throughput rates for each source at the OMCF (S-64, S-65, S-66, S-67, S-68, S-69, S-70) and summarize POC and NH_3 emissions and emission rates for each abatement device at the OMCF (A-7, A-9, A-11) each month and for each consecutive rolling twelve-month period.
    c. Records of all biofilter and baghouse parametric monitoring events, results, deviations from potential and optimal operating parameter limits established per the BMP, corrective actions taken, and re-monitoring events, and dates that compliance was restored, as detailed in the BMP and Parts 21 and 24.
    d. Records of all inspections, maintenance events, and repair actions for the biofilter and baghouse.
    e. Maintain a BMP manual identifying the ranges for temperature, moisture, oxygen, and of any other applicable operating parameters for the composting operation and biofilters. The BMP shall be submitted to the District for review within 120 days of conducting the District approved initial source test required by Part 29 and must be approved by the District before issuance of the Permit to Operate.
    f. Maintain records of IVC feedstock initiation dates, completion dates, and temperature records. Identify and record any instances and reason why the minimum retention time described in Part 16 of this permit condition were not met.
    g. Maintain records of IVC compost operating parameters and biofilter monitoring and test data as required in the BMP. Identify and record any instances when the IVC compost or biofilter operating parameters were outside of the desired ranges memorialized in the BMP. Identify and record the action taken to rectify the situation.
    h. Maintain records of the blower and monitoring system downtime and the remedy. Maintain records of all maintenance activities conducted on the blower, associated piping, monitoring, and control systems.
    i. Maintain records of finished compost sales and dates removed from the site. Maintain records of the removal and disposal of any material due to process breakdown or failed testing.

j. Maintain records of vehicle trip data for vehicles used for green waste, food waste, compost , biofilter material deliver, transfer, processing, and pickup; paved and unpaved road distances; vehicle fleet weights; and associated emissions calculations.
k. Maintain records of test data and associated emission calculations to demonstrate compliance with the annual mass emission limits for Phase's 1 and 2 in Parts 19 and 20, respectively. The owner/operator shall maintain all records in a District-approved log. The owner/operator shall retain the records for two years from the date of entry and make them available for inspection by District staff upon request. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations. (Basis: Cumulative Increase)

Recommendations

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source is a major modification (as defined in District Regulation 2-2-218 for having an increase in POC emissions greater than the major modification thresholds) which triggers the public notification requirements of District Regulation 2-2-405. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following sources:

S-64 OMCF Organic Material Stockpiles
Abated by Dust Collector DC-1 A-12 (12,316 cfm) and Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-65 OMCF Pre-Processing Material Handling Operation
Abated by Dust Collector DC-1 A-12 (12,316 cfm) and Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-66 OMCF Rotary Drum Reactors #1 and #2 (Phase 1)
Abated by Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-67 OMCF Rotary Drum Reactors #3 and #4 (Phase 2)
Abated by Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-68 OMCF In-Vessel Composting Lanes #1 through #8 (Phase 1)
Abated by Acid Gas Scrubber and Biofilter #3 A-9 (Surface area = 5,176 sq ft, Depth = 8 feet, Blower flow rate = 48,000 cfm, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-69 OMCF In-Vessel Composting Lanes #9 through #16 (Phase 2)
Abated by Acid Gas Scrubber and Biofilter #4 A-11 (Surface area = 5,176 sq ft, Depth = 8 feet, Blower flow rate = 48,000 cfm, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

S-70 OMCF Post-Processing Material Handling Operation
Abated by Dust Collectors DC-2 A-13 (12,316 cfm), DC-3 A-14 (12,316 cfm), DC-4 A-15 (12,316 cfm), and DC-5 A-16 (10,012 cfm) and Acid Gas Scrubber and Biofilter #2 A-7 (Surface area = 4,227 sq ft, Depth = 8 feet, Blower flow rate = 35,000 cfm Phase 1 and 38,000 cfm Phase 2, Media type = Biomix of broken and fibrous roots 50-120mm (approx. 30%) and pine bark/woodchips 20-50mm (approx. 70%))

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Stanley Tom, P.E. Date
Air Quality Engineer

Appendix A

Operating Scenarios

<u>Typical operating scenario</u>

Pre-processing operations occur for five days in the week. The maximum total incoming organic waste from all sources to the OMCF is 729.7 tons/day which includes both compostable and non-compostable material. The initial pre-processing separates out 41.93 tons/day of inert/non-compostable materials out of the RDR feed stream. The available feed to the RDRs is based on 687.7 tons/day (729.7 – 41.93 tons/day) for each of the five days the pre-processing operation occurs.

The RDRs are fed six days in the week with materials from the pre-processing operation. The actual daily throughput through the RDRs is 573.14 tons/day (687.7 tons/day x 5 days pre-processing / 6 days RDR feed). The material passing through the RDRs is further broken down in size as it traverses the RDRs. The material coming out from the RDRs is further screened for material sizing before being transferred to the IVC lanes The total non-compostable residue, post-RDR is 137.74 tons/day thus resulting in 435.4 tons/day (573.14 – 137.74 tons/day) as the feed to the IVC lanes.

The IVC lanes are fed six days in the week with screened, compostable waste from the RDRs with a throughput of 435.4 tons/day. The resulting compostable material from the IVC operation is then sent to the post-processing operation.

Post-processing operations occur six days in the week. The output of the IVC lanes is processed for final inert screening/removal prior to automated loadout onto trucks as a marketable compost product.

In each of the above steps the throughput reductions reflect removal of non-compostable material and processing of the compostable material. Reductions are not attributable to any conversion of material to fugitive emissions. The non-compostable residue consists of inerts, inorganic material, or material not suitable for composting. This material is shipped offsite for appropriate disposal. The City of San Leandro, as lead agency under CEQA, considered both onsite and offsite emissions of the OMCF (referred to as the Organics Facility) in an adopted (2011) Initial Study/Negative Declaration (IS/ND).

<u>Alternative operating scenarios</u>

<u>Scenario #1</u>

If there is a two day disruption of feedstock supply from the OMRF, the throughput to preprocessing could increase to 1000 tons per day for three days based on three shifts operating rather than the two shifts under normal operation. This is the basis for the proposed maximum throughput of 1,000 tons per day for S-65. However, the RDR is expected to operate under the typical operating scenario of 573 tons per day.

OMRF Down 2 Days (Pre-processing Max Operating Assumption)	Mon	Tue	Wed	Thu	Fri	Sat	Sun		Mon	Tue	Wed	Thu	Fri	Sat	Sun
Conveyed to Pre-processing	0	0	1000	1000	1000	729	0		729	729	729	729	729	0	0
Conveyed to Stockpile	0	0	941	941	941	686	0		686	686	686	686	686	0	0
Processed in RDR	0	0	573	573	573	573	573		573	573	573	573	573	573	501
Balance in Stockpile	0	0	368	736	1104	1217	644		757	870	983	1096	1209	636	135

Scenario #2

If the RDRs are shut down due to a breakdown or for maintenance for two days but the other operations continue operating according to target operating assumptions, the maximum quantity stockpiled could be 1,711 tons per day, which is the basis for the proposed maximum throughput of S-64.

OMCF Down 2 Days (Target Operating Assumptions)	Mon	Tue	Wed	Thu	Fri	Sat	Sun		Mon	Tue	Wed	Thu	Fri	Sat	Sun
Conveyed to Pre-processing	729	729	729	729	729	0	0		729	729	729	729	729	0	0
Conveyed to Stockpile	686	686	686	686	686	0	0		686	686	686	686	686	0	0
Processed in RDR	0	0	573	573	573	573	573		573	573	573	573	573	573	573
Balance in Stockpile	686	1372	1485	1598	1711	1138	565		678	791	904	1017	1130	557	-16

Scenario #3

If the RDRs are shut down due to a breakdown or for maintenance for two days and the RDR fill volume is assumed to be increased slightly and the density of the process material is assumed to be about 60% higher than under normal operations (due to density fluctuations resulting from rainy days, seasonal effects or changes in the feedstock material due to waste generation fluctuations or material processing changes upstream), the RDR could process a maximum throughput of up to 908 tons per day for the first three days following the shutdown which is the basis for the proposed maximum throughput of S-66 and S-67. The 908 tons per day is an estimate by the manufacturer of the maximum amount of material that could be processed through the RDR while the other operations continue operating under their typical operating scenarios.

(Increased RDR Density and Fill Volume Assumptions)	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Conveyed to Pre-processing	729	729	729	729	729	0	0
Conveyed to Stockpile	686	686	686	686	686	0	0
Processed in RDR	0	0	908	908	908	573	133
Balance in Stockpile	821	1507	1285	1063	841	268	135

The stockpiling and composting operation are expected to be a source of organic, ammonia, and particulate emissions. All VOC emissions discussed in this evaluation are assumed to be precursor organic compounds (POC), and particulate matter emissions are attributed to vehicular traffic (including vehicles delivering feedstock and taking away rejects and finished compost), screening, separating, and conveying operations.

Appendix B

Building Capture Efficiency Assumptions

Building Capture Efficiency Assumptions

The following is a summary of the air balance and ventilation design for the Pre and Post-Processing/RDR rooms and the IVC Phase 1 (Lanes 1-8) and Phase 2 (Lanes 9-16) buildings.

IVC Lane Rooms Air Balance

The ventilation flows are essentially identical for both the IVC Lanes 1-8 room and IVC Lanes 9-16 room. The floor area of IVC Lanes 1-8 room is 40,069 square feet and the floor area of IVC Lanes 9-16 room is 41,013 square feet. Supply air for both rooms will be provided (40,000 cubic feet per minute (cfm) per room of fresh air) by variable speed intake fans located on the west wall of both rooms, plus an assumed leakage rate ingress from the outside of 6,000 cfm. Additionally, it is estimated the building air will expand by 4,000 cfm due to the increased air temperature from composting occurring within the building. This inlet air will be ducted to the abatement systems by a 48,000-cfm induced draft blower. Each IVC room has its own dedicated blower. The height of each IVC room is 35 feet. The number of air exchanges for IVC Lanes 1-8 room is 2.05 per hour [(48,000 cfm x 60 min/hr) / (40,069 ft2 x 35 ft)]. The number of air exchanges for IVC Lanes 9-16 room is 2.01 per hour [(48,000 cfm x 60 min/hr) / (41,013 ft2 x 35 ft)].

Air will be drawn into the composting lanes to maintain aerobic conditions via the lane supply air fans, which inject air into the compost lanes from floor nozzles through the composting material and into intake ducts on the lane walls near the top of the compost pile.

The air pressure between the lane cover and the surface of the compost is maintained at vacuum conditions to ensure that emissions from the compost do not enter into the main room airspace and are instead pulled into the exhaust system leading from the covered lanes to the respective abatement system.

There are no truck doors leading directly to the outside from the IVC section of the building. There are two roll up doors in the transfer wagon maintenance room, one on either side of the maintenance room, allowing the transfer wagon to be moved into the maintenance room and for large parts to be brought in from outside. These doors will not be opened simultaneously, thus ensuring integrity of the building seal at all times. Since there are no doors open to the outside and the air in the compost lanes is maintained at vacuum conditions, with an air balance of approximately 48,000 cfm in/out (to abatement), the IVC lane room capture efficiency would approximate that of the OMRF when the doors are closed, which is assumed to be 99%. For the purposes of the emission calculations in this application, a capture efficiency of 95% (versus 99%) is conservatively assumed.

For the OMRF, the applicant performed an air balance test on August 31, 2018. The test and balance report showed the building ventilation system operated as designed. The minimum exhaust design criteria of 120,000 cfm was met and the conditions required for 95% capture efficiency for the OMRF building was demonstrated.

Pre-Processing Operation Air Balance

Supply air to the pre-processing operation includes 20,000 cfm drawn from the post-processing room and 10,000 cfm from a variable speed west wall inlet fan. Additionally, it is estimated that approximately 5,000 cfm will be drawn into the room from building and door leakage due to vacuum conditions that will be maintained in the building by a 35,000-cfm induced draft blower that exhausts to the acid scrubber/biofilter #2 (A-7) abatement system.

The Pre-Processing area will have five 12' x 8' (96 sq. ft.) roll up doors on the west wall, only one of which will be opened at a time relatively infrequently and for a short duration to enable an inert material roll-off bin to be removed and replaced as needed.

With all doors closed, a 99% capture efficiency is expected as assumed with the OMRF. With the maximum of one roll-off door open, the face velocity is estimated to be 106 feet per minute (fpm) with 1.9 air changes per hour. This exceeds the face velocity of 50 ft/min in the OMRF application, which was assumed to represent 90% building capture. In the OMRF application, the loading doors were open approximately 35% of the operating time and closed during all other periods based on the proposed design and operation. While the tipping doors were closed, the District used a 99% capture efficiency. In the OMCF application, the percent of operating time that the roll-off doors are expected to be in an open condition will be well below 35%, which, combined with the same assumption of 99% building capture while the doors are closed, will result in an average capture rate of 95%. Since the pre-processing operation will operate with all doors closed a greater percentage of time than at the OMRF, an overall building capture of 95% is conservatively assumed. The permit conditions will require the facility to perform an air balance test to verify the assumed building capture efficiency.

Post-Processing Operation Air Balance

The ventilation design calls for approximately 20,000 cfm of air supplied by 17,500 cfm of fresh air inlet from a variable speed west wall inlet fan, along with an estimated 2,500 cfm of building porosity leakage and temperature-induced expansion.

The post-processing area has five (5) 12' x 12' (144 sq. ft. per door) roll up doors on the west wall, with a maximum of two doors that could be opened simultaneously to enable shipment of product (compost) and/or waste materials from the post-processing operation. With two doors open simultaneously, the resulting estimated face velocity would be 61 ft/min.

This exceeds the face velocity of 50 ft/min in the OMRF application, which was assumed to represent 90% building capture. In the OMRF application, the loading doors were open approximately 35% of the operating time and closed during all other periods based on the proposed design and operation. While the tipping doors were closed, the District used a 99% capture efficiency. The percent of operating time that the doors could be in an open condition would be expected to be less than 35%, which, when combined with the same assumption of 99% building capture when the doors are closed, will result in an average capture efficiency of 95%. Since S-70 (Post-Processing Material Handling Operation) will operate with all doors closed a greater percentage of time than at the OMRF, an overall building capture efficiency of 95% will be conservatively assumed.

To demonstrate compliance with these capture efficiency assumptions, the owner/operator will be required by the proposed permit conditions to perform testing to verify that the OMCF building is operating under negative pressure under the ventilation scenarios outlined in Part 16 of permit condition #26859. Anemometer readings should show an average of at least 50 feet/minute of inlet air flow at the doors. The test and balance report as required by the permit conditions will verify compliance with the capture efficiency assumptions.

For the OMRF, the applicant performed an air balance test on August 31, 2018. The test and balance report showed the building ventilation system operated as designed. The minimum exhaust design criteria of 120,000 cfm was met and the conditions required for 95% capture efficiency for the OMRF building was demonstrated.

Appendix C

Emission Factor Basis and Calculations

Precursor Organic Compounds

Stockpiling operations include POC emissions due to the biological decomposition of waste. Municipal solid waste (MSW) streams contain organic and rapidly decomposable material such as food waste, leaves, grass , and trimmings. The evaluation considered the waste stream data, expected storage time in the stockpile for this project, and the available green waste stockpile emissions data presented in the document entitled "ARB Emissions Inventory Methodology for Composting Facilities" to estimate a POC stockpile emission factor for MSW. Consistent with the OMRF application (#28167), a POC factor of 0.101 pounds of POC per wet ton-day for uncontrolled emissions due to stockpiling of MSW is assumed in this evaluation.

In addition, the applicant conducted flux chamber testing to quantify potential emission rates of POC associated with the OMRF feedstock (MSW) during processing in the OMRF. Raw MSW was tested and it was assumed the material remained unchanged throughout the process. In addition, maximum surface areas were assumed for both the tipping floor and conveyors even though it is not expected that the entire surface of the process would be covered by waste. The resultant tested values are summarized in Table A-1 below for an average 2-day stockpile period.

Table A-1. Emission Factors for Tipping Floor and Conveyor System

Operation	POC Emissions	
	(pounds/day)	(pounds/ton)
Tipping Floor	8.5	0.0065
Conveyor System	25	0.020
	Total	**0.0265**

The total POC emission factor based on the test results summarized in Table A-1 is 0.0265 lb/ton is less conservative than the District's proposed use of 0.101 lb/wet ton that has been used to estimate emissions for this application.

<u>RDR and IVC Operations (S-66, S-67, S-68, S-69)</u>

The applicant has provided computer modeling data which estimates the material degradation rate in both the RDR and IVC operations. As shown in Table A-2, the total material degradation in the RDR operations is about 20% and the total material degradation in the IVC operations is about 80%. These percentages will be used to calculate emissions from each of the RDR and IVC operations.

Table A-2. OMCF Degradation Ratio

Operating Unit	Daily Degradation Rate (%)	Days in Unit	Total Degradation % per Unit	Ratio
RDR	2.60%	2.5	6.5%	16.7%
IVC	1.71%	19	32.5%	83.3%

A POC emission factor of 3.58 lb/wet ton is recommended for green waste and food waste in Table III-1 of the document titled "ARB Emissions Inventory Methodology for Composting Facilities" dated March 2nd, 2015 and will be used to estimate POC emissions from the composting process occurring in the RDRs and IVCs.

Non-Precursor Organic Compounds

An emission factor for NPOC was derived by reviewing specific compounds in total VOC as provided in an article published by the University of California Davis entitled "Volatile Organic Compound Emissions from Green Waste Composting: Characterization and Ozone Formation". This article determined that acetone (an NPOC) comprised 0.47 percent by volume of the total VOC from composting operations. Therefore, for S-66 through S-69, the NPOC emission factor is found through the following equation:

EF (NPOC) = (0.47/100) x 3.58 lbs/wet ton = 0.0168 lb/ton

Ammonia

A source test performed on uncontrolled storage piles of green waste and food waste at a facility not owned or operated by the applicant in August 2017 measured the ammonia emission rate. The higher emission rate of 5.3E-04 lb/wet ton from the green waste storage pile (4.3E-04 lb/wet-ton) and food waste storage pile (5.3E-04 lb/wet-ton) from this source test was used to quantify ammonia emissions from S-64.

NH_3 emission factor of 0.78 lb/wet ton recommended for green waste and food waste in Table III-1 of the document titled "ARB Emissions Inventory Methodology for Composting Facilities" dated March 2nd, 2015 was used to estimate NH3 emissions from the composting process occurring in the RDRs (S-66 and S-67) and IVCs (S-68 and S-69) discussed below.

Particulate Matter

Material Handling (S-65 Pre-Processing Operation and S-70 Post-Processing Operation)

The particulate matter emission factor for handling of the material is from AP-42 Section 13.2.4 Aggregate Handling and Storage Piles Table 13.2.4-1 November 2006.

The following equation has been suggested for use when estimating particulate matter emissions from batch drop operations of aggregate materials, such as adding material to stockpiles or removing them from a stockpile and dropping them into a truck. This equation will be used to estimate particulate emissions due to material handling. The equation is appropriate for material silt contents ranging from 0.44%-19% and moisture contents ranging from 0.25% – 4.8%.

$EF = k*(0.0032)*[(U/5)^{1.3}]/[(M/2)^{1.4}]$

Where
EF = emission factor (lb/ton)
k = particle size multiplier = 0.35, for PM_{10}
k = particle size multiplier = 0.053, for $PM_{2.5}$
U = mean wind speed (mph)
M = material moisture content (%)

Pre-Processing Operation (S-65)
EF = emission factor (lb/ton)
k = particle size multiplier = 0.35, for PM_{10}
k = particle size multiplier = 0.053, for $PM_{2.5}$
U = mean wind speed (mph) = 1.3 (AP-42 Section 13.2.2, indoor operation)
M = material moisture content (%) = 50% (Applicant proposed. Moisture content of 4.8% will be used since that is the moisture content range of the equation according to AP-42. Initial moisture content testing will be required in the permit conditions to verify the moisture content assumption.)

$EF (PM_{10}) = 0.35*(0.0032)*[(1.3/5)^{1.3}]/[(4.8/2)^{1.4}] =$ 5.71E-05 lb/ton
$EF (PM_{2.5}) = 0.053*(0.0032)*[(1.3/5)^{1.3}]/[(4.8/2)^{1.4}] =$ 8.64E-06 lb/ton

Post-Processing Operation (S-70)
EF = emission factor (lb/ton)
k = particle size multiplier = 0.35, for PM_{10}
k = particle size multiplier = 0.053, for $PM_{2.5}$
U = mean wind speed (mph) = 1.3 (AP-42 Section 13.2.2, indoor operation)
M = material moisture content (%) = 30% (Applicant proposed. Moisture content of 4.8% will be used since that is the moisture content range of the equation according to AP-42. Initial moisture content testing will be required in the permit conditions to verify the moisture content assumption.)

$EF (PM_{10}) = 0.35*(0.0032)*[(1.3/5)^{1.3}]/[(4.8/2)^{1.4}] =$ 5.71E-05 lb/ton
$EF (PM_{2.5}) = 0.053*(0.0032)*[(1.3/5)^{1.3}]/[(4.8/2)^{1.4}] =$ 8.64E-06 lb/ton

Material Processing (S-65 Pre-Processing Operation and S-70 Post-Processing Operation)

Debagging Operations

The material processed will be handled by the debagger. The particulate emission factor for the debagger is from AP-42 section 10.3 Plywood Veneer and Layout Operations Table 10.3-1 (4th Edition) for log debarking, assuming 60% of emissions are PM_{10} with a 50% fraction of $PM_{2.5}$. The use of these emission factors is consistent with

Application 25019 (for West Contra Costa County Landfill - Richmond) and Application 26437 (for Waste Management of Alameda County – Altamont Pass).

EF (PM_{10}) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP = 0.0144 lb/ton
EF ($PM_{2.5}$) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP x 0.5 lb-$PM_{2.5}$/lb-PM_{10} = 0.0072 lb/ton

Screening Operations
The material processed will be screened by the screener. The particulate emission factor for the screener is from AP-42 section 10.3 Plywood Veneer and Layout Operations Table 10.3-1 (4th Edition) for log debarking, assuming 60% of emissions are PM_{10} with a 50% fraction of $PM_{2.5}$. The use of these emission factors is consistent with Application 25019 (for West Contra Costa County Landfill - Richmond) and Application 26437 (for Waste Management of Alameda County – Altamont Pass).

EF (PM_{10}) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP = 0.0144 lb/ton
EF ($PM_{2.5}$) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP x 0.5 lb-PM_{10}/lb-$PM_{2.5}$ = 0.0072 lb/ton

Conveyor Transfers
PM_{10} and $PM_{2.5}$ emissions from conveyor transfer operations are conservatively estimated using USEPA AP 42, Table 11.19.2-2, PM_{10} Emission Factor for Uncontrolled Conveyor Transfer Point (Crushed Stone). The uncontrolled $PM_{2.5}$ emission factor was estimated by multiplying by a ratio of $PM_{2.5}/PM_{10}$ for controlled transfer. The use of these emission factors is consistent with Application 25019 (for West Contra Costa County Landfill - Richmond) and Application 26437 (for Waste Management of Alameda County – Altamont Pass).

EF (PM_{10}) = 0.0011 lb/ton
EF ($PM_{2.5}$) = 0.0011 lb-PM_{10}/ton x (1.3E-05 / 4.6E-05) lb-$PM_{2.5}$/lb-PM_{10} = 0.00031 lb/ton

<u>*Vehicle Traffic Emissions*</u>
The emission factors due to mobile equipment operating within the OMCF building are calculated below. The applicant has stated that roadway emission calculations for the exterior of the building are unnecessary since there are no increases or decreases to the number of mobile equipment coming into and out of the facility as a result of the OMCF operation. The Negative Declaration (State Clearing House Number: SCH2010112069) prepared by the City of San Leandro states the proposed project would not generate new traffic as there will be no increase in the amount of waste accepted at the facility. The composting operation will result in a reduction in the number of transfer truck trips over baseline conditions by 8-10 trips per day due to the reduction in the volume of food/green and mixed organic waste stream during the decomposition process to produce compost. The amount of green and food waste and other organics that could be processed as reviewed by the City of San Leandro in the CEQA documentation was 1,000 tons/day and 365,000 tons/year which is consistent with the facility's current solid waste permit issued by the LEA. The maximum throughput that will be processed through the RDR and IVC operations in this application is 908 tons/day and 205,700 tons/year. Though the stockpile (S-64) will have a permitted throughput of 1,711 tons per day and 218,200 tons per year, the stockpiled material will not be processed (like it would be in the case of the RDR/IVC). Instead, the stockpiled material will be held for pre-processing prior to being fed into the RDR. It should be noted that 1,711 tons per day represents the estimated maximum stockpiled amount in the event of non-normal operation during a breakdown scenario. Vehicle traffic was also reviewed by the City of San Leandro in the CEQA documentation at a maximum of 5,761 vehicles per day and the project will not increase the inbound truck traffic beyond permitted traffic volumes evaluated by the City of San Leandro.

Vehicle Traffic Dust Within OMCF Building
Dust will be generated within the OMCF Building due to mobile equipment (loaders, forklifts, etc.). Although the building floor will be paved, it could contain debris. As a worst case estimate, uncontrolled emissions for these operations will be based on unpaved road calculation equations.

The emission factor for mobile equipment on unpaved roads within the project building is calculated based on miles traveled per year of unpaved road estimated by the applicant. The permit conditions will require that the facility maintain records of vehicle trip data and associated emission calculations. These mileage estimates were provided in the application. These are estimates based on the consideration of the preliminary design and operations plan.

Pre-Processing Operation	= 303 miles per year
RDR Loading	= 1,439.5 miles per year
Maintenance Area	= 118.2 miles per year
Total	= 1,860.7 miles per year

The following equation found in AP-42 Chapter 13.2.2 November 2006 will be used to calculate emissions.

$EF = k(s/12)^a(W/3)^b$ and $EF_{ext} = E[(365 - P)/365]$
$EF_{ext} = [k(s/12)^a(W/3)^b]\ [(365 - P)/365]$

Where

EF_{ext}	=	Annual Emission factor, pounds per vehicle miles traveled (lbs/VMT)
k	=	empirical constant (lbs/VMT) = 1.5, for PM_{10} from Table 13.2.2-2
k	=	empirical constant (lbs/VMT) = 0.15, for $PM_{2.5}$ from Table 13.2.2-2
a	=	empirical constant = 0.9, for PM_{10} industrial roads from Table 13.2.2-2
b	=	empirical constant = 0.45, for PM_{10} industrial roads from Table 13.2.2-2
s	=	surface material silt content (%)
	=	6.4 mean value for municipal solid waste landfills from Table 13.2.2-1
W	=	mean vehicle weight (tons) = 19.5 estimate provided by applicant
P	=	number of days with at least 0.01 in. of precipitation in the averaging period
	=	0 days, (AP-42 Figure 13.2.1-2, conservative assumption for maximum emissions)

$EF_{unpaved}\ (PM_{10}) = [1.5(6.4/12)^{0.9}(19.5/3)^{0.45}]\ [(365 - 0)/365] =$ 1.978 lbs/VMT
$EF_{unpaved}\ (PM_{2.5}) = [0.15(6.4/12)^{0.9}(19.5/3)^{0.45}]\ [(365 - 0)/365] =$ 0.198 lbs/VMT