Source Reference 19

Odor Impact Minimization Plan for MSS Transfer Station 1050 Andersen Drive, CA 94901, Edgar & Associates, February 10 2015

Marin Sanitary Service

CONSERVATION – OUR EARTH, OUR MISSION, OUR JOB

ODOR IMPACT MINIMIZATION PLAN

for the

Marin Sanitary Services Transfer Station

1050 Andersen Dr.
San Rafael, California 94901

Submitted to:

Marin County Community Development Agency
Environmental Health Services Division

Prepared by:

Edgar & Associates

1822 21st Street
Sacramento, CA 95811

February 10, 2015

Table of Contents

Regulatory Authority:

California Code of Regulations Title 14, Section 17863.4 (effective on April 4, 2003) requires an Odor Impact Minimization Plan (OIMP) for all compostable material handling operations and facilities. The following OIMP is being submitted to the Marin County Community Development Agency, Environmental Health Services Division for operations associated with the processing of compostable materials in the Marin Sanitary Services (MSS) complex in San Rafael, CA.

The Bay Area Air Quality Management District also has several rules regarding odors, Regulation 1-301 (Public Nuisance) and Regulation 7 (Odorous Substances), that the project must meet in which will be incorporated into this OIMP.

Facility Name:	Marin Sanitary Services Transfer Station
Facility Location:	1050 Andersen Dr. San Rafael, CA 94901 Phone (415) 456-2601
Mailing Address:	1050 Andersen Dr. San Rafael, CA 94901 Phone (415) 456-2601
Operator:	Marin Sanitary Service 1050 Andersen Dr. San Rafael, CA 94901 Phone (415) 456-2601
Contacts:	Patty Garbarino (President) Marin Sanitary Service 1050 Andersen Dr. San Rafael, CA 94901 Phone (415) 456-2601
	Evan Edgar, Principal Civil Engineer Edgar & Associates, Inc. 1822 21sr Street Sacramento, CA 95812 Phone (916) 739-1200

Regulatory Compliance

Marin Sanitary Services Transfer Station (MSSTS) currently operates under a Solid Waste Facilities Permit (SWFP) issued by the Marin County Community Development Agency, Environmental Health Services Division (EHS) and includes the Marin Resource Recovery Center (MRRC). The permit is for transferring of municipal solid waste (MSW), the processing of recyclables and construction and demolition (C&D), and the processing of green waste and food scraps.

Marin Sanitary Service (MSS) has been providing municipal solid waste collection and recycling services to the County of Marin community since 1948 serving over 30,000 residential and commercial accounts in 9 communities. MSS provides residential and commercial trash, recycling and green waste collection and operates a transfer station, recycling center, nonhazardous materials resource center, household hazardous waste collection program, debris box rental, concrete and soil recovery, wood recovery, commercial food waste collection program, and green waste composting operations. The MSS facility land use is permitted under Master Use Permit UP96-8 issued by the City of San Rafael (amending prior UP92-7) and a Planned Development (PD1580) zoning district. MSS waste management facility operations are also subject to strict County and State regulations and permitting requirements, including those enforced by the California Department of Resources Recycling and Recovery (otherwise known as CalRecycle – previously the California Integrated Waste Management Board).

This OIMP is submitted for all compostable material handling operations occurring at the facility as permitted and includes the processing of source-separated commercial organics within the Transfer Station and delivered to the Central Marin Sanitation Agency (CMSA), residential co-collected organics processed within the Resource Recovery Center and delivered to a permitted composting facility, and the proposed anaerobic digestion facility that will receive multi-family co-collected organics, mixed commercial organics and residential co-collected organics to produce biogas and digestate which will be further composted at an off-site compost facility after the digestion process.

Material Type:

Compostable materials handling occurs at three separate and distinct operations:

- Residential co-collected green waste and food waste processing within Marin Resource Recovery Center (MRRC)
- Commercial source-separated food waste processing within MSSTS
- Multi-family, mixed commercial organics, and co-collected residential organics within the proposed anaerobic digestion facility being located within the MSSTS or adjacent to the MRRC. The final location and operations will be incorporated into the next Solid Waste Facility Permit (SWFP) Revision of the MSSTS.

Site Operations:

Residential co-collected green waste and food waste within MRRC

The co-collected green waste and food waste is processed within the enclosed MRRC, which includes handling, sorting and grinding of the received materials, all occurring within 48 hours of receipt. The processed material will qualify as compost feedstock to be delivered to a permitted compost facility. Once food waste is co-collected with green waste, the processed feedstock can no longer be used as ADC according to Title 27 specifications.

The amount of green material collected from residential sources can amount to as much as 53 TPD. The amount of co-collected food waste could add a peak of 5 to 11 tons per day, which can be accommodated in 15 to 30 minutes of additional processing. The two materials combined may range from 58 TPD to 64 TPD. The existing green waste and wood waste grinding operation can handle 20 tons per hour. Therefore an incremental increase in food waste tons will not impact the design of the operations. MRRC has design capacity to efficiently process this material.

Commercial source-separated food waste processing program within MSSTS

The primary function of the food waste processing operations within the enclosed MSSTS is to further aid in the recovery of commercial organic materials by providing a food waste feedstock for energy generation using anaerobic digestion (AD) technology at the Central Marin Sanitary Agency's (CMSA) Waste Water Treatment Plant (WWTP). Other publicly-operated treatment works (POTW) in the region, such as East Bay Municipal Utilities District, have similar AD projects underway and can provide a contingency plan for feedstock delivery if needed.

Collection trucks will enter the Transfer Station from Jacoby Street, pass along certified scales and be weighed, and dump food waste into a food waste bunker for storage. A front-end loader would then load the food waste from the bunker into the infeed bin above the infeed conveyor. Limited storage of the food waste will occur, typically 8 hours but occasionally up to 48 hours from the time the collection truck is received to when the processed food waste is removed from the Transfer Station. The material would be stored in a water tight dump box and there will be no overnight storage of food waste in collection vehicles. The permitted holding time for all materials at the MSS Transfer Station is 48 hours. After storage, the material is hauled to the Central Marin Sanitary Agency's Waste Water Treatment Plant to be combined with wastewater for anaerobic digestion.

The proposed equipment for the separation facility includes a storage bunker, front-end loader, infeed bin, and infeed conveyor with chain belt with flutes bolted to the belt, food waste hammer mill grinder, and a water-tight dump box below the food waste grinder. The processing equipment would be placed on the concrete floor inside the Transfer Station building. A drive-

over containment berm has been constructed around the food waste processing operations to contain any free liquids that may be generated. Any free liquids will drain into the adjacent Transfer Station pit where the solid waste would absorb the liquids into the voids of the mass. Prior to grinding, the food waste will be sorted to remove plastic and other contaminants such as corks, food service items and table linens, which could be damaging to the grinder or be deleterious to the digestion process. Plastic and other contaminant material will be removed manually on the sort line and placed in a bin below that will be removed every 48 hours and dumped in the adjacent transfer station. The sorting operations may require two people working for about two hours per day processing the food waste, one in the front end loader and the other on the sorting line, plus additional time to clean and service the equipment.

A horizontal hammermill grinder is used for operation. Material is fed through a feed conveyor into the hammermill grinder. The hammers, which are attached to a rotor or shaft, impact the feed material, breaking it into smaller pieces. Below the hammer circle is a series of cast grates. The material remains inside the hammermill and is crushed or torn between the hammers and grates until its size is sufficiently reduced to pass through the grates where it is discharged onto water-tight dump box below.

The project will process a maximum of 15 TPD to 20 TPD, well below the design capacity of the system. The system is designed to process 20 tons per hour and since only 15 to 20 tons per day will be received, it is anticipated the system will be in operation approximately one hour per day. The system and the loading rate may occasionally be slowed by contamination. The processed material will be stored in the water-tight dump box at the end of the processing line typically for 8 hours prior to transport to the Central Marin Sanitary Agency's (CSMA) Waste Water Treatment Plant.

A debris box truck will be parked on the Andersen Street side of the Transfer Station to haul the water-tight dump box of processed food waste from the MSSTS facility to CMSA, which is approximately 0.5 mile east of MSSTS on Andersen Drive. CMSA operates 24 hours per day, 7 days per week and will be available to receive the processed food waste upon delivery by MSS. A standard of communication and deliveries will be developed between MSS and CMSA.

Multi-family, mixed commercial organics, and co-collected residential organics within the proposed Anaerobic Digestion facility

The AD Facility will receive pre and post-consumer food waste from multi-family residential, processed food waste, and co-collected residential green waste and food waste. The AD facility will be located within the MSSTS or adjacent to the MRRC and will be included in the next SWFP Revision of the MSSTS. The compostable material feedstock for the AD process will generate biogas in the form of methane, biogenic carbon dioxide and trace amounts of hydrogen sulfide, oxygen and nitrogen. The resulting digestate (residual solids and liquids) from the AD process will be reduced 30% by volume, will be considered compostable, and will be transferred within 24 hours to a designated composting facility in the area.

The facility involves a new technology to the United States, which will employ a pre-fabricated, small-scale, dry anaerobic digestion system called SmartFerm. The SmartFerm dry AD technology is licensed exclusively in the US to Zero Waste Energy, LLC (ZWE), and a San Jose-based developer of organic waste treatment projects utilizing dry AD technology.

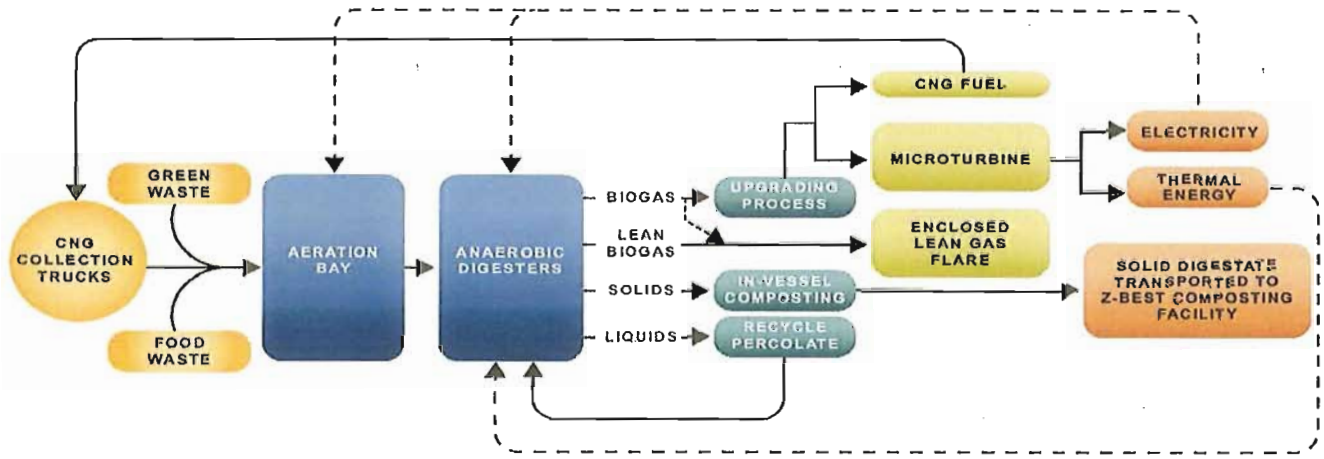
There are three options for the AD system. Option A includes an aeration bay, 4 anaerobic digesters, a percolate tank, an environmental control device, an emergency generator and the capacity to process 5,000 tons per year (tpy) of feedstock. Option B includes an aeration bay and has 8 anaerobic digesters instead of 4, allowing up to 12,500 tpy of material to be processed annually. This would generate over 41 million cf/yr of methane that would then be harnessed to produce combined heating and power (CHP). The amount of CHP generated annually at the increased capacity of Option B would be enough to support the electricity needs of the entire facility.

Option C includes the same annual capacity (12,500 tpy) and key components as Option B and differs in that the harnessed biogas would enter a biogas upgrade system and would produce renewable compressed natural gas (CNG) instead of CHP. The amount of CNG generated annual would be 160,000 diesel gallon equivalent (DGE) that could be used to supply collection vehicles or other CNG vehicles in the community.

The overview of system operations is as follows:

- The source-separated organic waste will be delivered to a negative air pressure aeration bay.
- The SmartFerm dry fermentation process begins in which feedstock is inoculated with percolate to begin the digestion process. The percolate is charged with microbial enzymes that enable the decomposition process.
- Electrical power would be supplied by a combination of the boiler system and grid-supplied power.
- A biofilter is used to clean the exhaust gases.
- The biogas rendered from the upgrading process is submitting to a combined heating and power (CHP) process rendering electricity and thermal energy that will feed back into the anaerobic digestion process (Option A processes less feedstock and therefore generates less electricity and thermal energy than Option B).
- Alternatively in the case of Option C, the biogas generated is purified to pipeline quality CNG using a biogas upgrade for transportation fuel.
- The compression and fueling system is designed to integrate with the BioCNG system and provide the transportation fuel.
- The remaining digestate is removed from the digesters and transported by vehicle to a nearby permitted facility to be composted.

Figure 1, Operational Process Summary



The compostable feedstock will be delivered by Marin Sanitary Services collection vehicles during operating hours.

The aeration bay could theoretically store up to 6 days of material in case of contingency, but will generally store feedstock for up to 48 hours. The feedstock is mixed within the aeration bay with a front-end loader to achieve an optimal blend of approximately 67% food waste and 33% green waste. Because the dry fermentation process requires that there be structure and porosity in the mixed feedstock to allow percolate to seep through the mass, no pre-processing of the yard debris is necessary. The aeration bay has a rolling door that closes when being loaded and is on negative air for odor control. The blended feedstock is then transferred by a bucket loader to one of the AD units for a period of 21 days. It may take an average of two days to fill an AD unit.

A wheel loader will transport the waste from the aeration bay into one of the digesters to begin the three-part AD process. In the start-up phase, the digesters are sealed and the waste is initially treated aerobically using an in-floor aeration system, which is activated immediately after the digester door is sealed. The aeration system pumps air into the organic waste material which creates aerobic digestion conditions to self-heat the material up to process temperatures. Temperature is measured with thermocouple devices located in each digester. During this phase, no biogas is produced and exhaust air is treated in an acid scrubber which removes ammonia. Following this, the air is treated by a humidifier then finally a biofilter which removes the particulate material, volatile organic compound (VOCs) and odor compounds. When thermophilic temperature is reached (approximately 120 to 130 degrees Fahrenheit [°F]), aeration ceases and anaerobic conditions are created as the aerobic microbes consume the available oxygen in the digester. This initial startup phase of the process lasts for approximately 12 hours; the fermentation phase begins once the start-up phase is complete.

Following the initial aeration of the organic material, thermophilic anaerobic conditions are maintained and percolation begins. This is known as the fermentation phase. Under anaerobic conditions, the organic waste is finely sprayed with conditioned process water containing the thermophilic micro-organisms ("percolate") that decompose the waste and produce biogas. This percolate is pumped in a closed loop between the digesters and the heated and insulated percolate tank located beneath the digester area. Percolate is sprinkled on the material on a daily basis for approximately 20 days causing the production of biogas. The percolate is collected in a drainage system, screened for solids in a specially designed weir called a "sandtrap" and gravity fed into the percolate tank where it is recharged with the thermophilic organisms required for digestion. In addition, high quantities of organic acids, which arise during the beginning of the process, are stored and degraded in the percolate tank to ensure proper pH balance.

The required thermophilic process temperature in the digesters is maintained through accurate process control of temperature and flow of percolate in the percolate tank. For this function the percolate tank is externally heated by the burner/boiler system and insulated. The production of biogas begins quickly after percolation. Biogas is primarily composed of approximately 60% methane and 35 to 40 percent carbon dioxide (CO2), in addition to small quantities of hydrogen sulfide, oxygen and nitrogen. The biogas is collected in an exhaust port on the back wall of each digester and stored in an external double-membrane biogas storage bladder located on the roof of the AD system. Stored biogas is available for later use in the CNG fuel production or is generated as electricity and thermal energy through the CHP process. The shut-down or "termination phase" of a digester generally commences six (6) hours or less before the digester hatch is opened. The process is as follows:

- Termination of percolation.
- Introduction of fresh air through the in-floor aeration system to terminate anaerobic digestion process and preserve carbon for composting.
- Purged air and biogas mixture are removed via a dedicated fan located in the mechanical room.

Exhausted purge biogas is collected in the biogas collection system until methane content reaches 22 percent at which point the purged biogas is combined with some of the stored biogas and sent to the burner/boiler system. When the methane content of the digester purge air decreases to 1 percent, the burner/boiler operation is terminated and the air is flushed to the acid scrubber, humidifier, and then to the biofilter. The stored biogas will be routed either to CHP or to a BioCNG biogas conditioning system. The BioCNG unit will process up to 100 standard cubic feet per minute (scfm) of biogas to produce up to 160,000 diesel gallon equivalents (DGE) of BioCNG annually. Following the termination phase of the process the digestate is removed from the anaerobic digesters and transported immediately to a designated compost facility. Ammonia and odor will be controlled by an acid scrubber, humidifier, and biofilter and negative air flow employed when digester doors are opened.

Odor Control

Current odors related to breakdown of putrescible waste are limited to within the Transfer Station and the co-collected green waste and food waste in MRRC, and are mitigated by the regular removal of material. The co-collected organic material in MRRC is usually ground that day and shipped out that night. The maximum hold time for each waste type is listed in the table below, where putrescible material such as commercial food waste and co-collected organic materials are limited to minimize odor. The proposed AD Facility will be fully enclosed, on negative air, with the emission being treated within a biofilter.

In order to control odor releases, MSS aims for maximum holding times of less than the allowable 48 hours for all municipal solid waste (MSW), green waste and/or food waste in accordance with Title 14. Typical operations would process the co-collected green waste and food waste in 24 hours where up to 48 hours is permitted. Typical operations for commercial food waste storage is 8 hours where up to 48 hours is permitted. Typical operation for the AD facility will blend organics within 24 hours of when material arrives and place it into the digesters within 48 hours of arrival.

Storage Time of Materials

Material Type	Location	Typical holding time	Maximum holding time
MSW	MSSTS	24 hours	48 hours
Commercial food waste	MSSTS	8 hours	48 hours
Green Waste	MRRC	24 hours	48 hours
Co-collected green waste and food waste	MRRC	24 hours	48 hours

The closest receptors will be operations staff and management who will be onsite during operating hours to monitor the compostable materials handling operation. The operation is sited in a heavy industrial area with only a few residential receptors located within 1000 feet across Highway 101 to the west.

The following odor impact minimization control will be employed for the proposed AD system:

- Enclosed areas for processing of compostable feedstock with negative aeration.
- Dedicated source separated organic waste aeration bay for short-term storage of received feedstock.
- The AD thermophilic process that optimizes methane production, reducing VOCs in the residual digestate material.
- Hydrogen sulfide (H2S) removal system post AD and prior to biogas production.
- Siloxane/VOCs removal system and CO2 removal system.
- Specially designed burner/boiler system to combust biogas with low methane content and recover heat for AD process heating requirements.
- An internal combustion engine stripping ammonia and other pollutants from the methane during the anaerobic digestion but prior to shipment offsite.
- An acid scrubber to remove ammonia emissions from AD start-up and shut-down phases.
- Use of a biofilter for additional control of POCs and ammonia before exhausting to the air.

Section 17863.4 (b) (1) - Odor Monitoring Protocol

Composting facilities regulated by CalRecycle are required to have an Odor Impact Minimization Plan (OIMP). The OIMP includes identifying of neighboring odor receptors and a plan to mitigate their exposure to potential odors, a survey of geological considerations, a Complaint Response Protocol and an Odor Complaint Reporting Form. The Complaint Response Protocol describes the procedures to follow upon receiving a complaint. The protocol includes measures to identify the odor and requires appropriate adjustments to storage process controls and facility improvements to reduce odors.

The closest receptors will be staff and management who will be onsite during operating hours to monitor the organic waste handling operation and the loading of material in the Aeration Bay. The handling of digestate will occur during off-peak hours when the majority of personnel and adjoining neighbors are unable to detect potential odors.

The MSS complex is surrounded by industrial (PG&E service yard and Golden Gate Transit bus yard) and building material (Golden State Lumber and Rafael Lumber yards) uses to the north, the public/quasi-public (Central Marin Sanitation Agency Wastewater Treatment Plant) uses to the west, the incorporated boundaries for the City of Larkspur to the south, and the U.S. Highway 101 and SMART (Sonoma Marin Area Rail Transportation) right-of-ways (ROW) to the west. The MSS site is located approximately 400' west of the closest residences within the City of San Rafael boundaries, separated by both the Highway 101 and SMART ROWs. The closest residences to the MSS site are located approximately 200' south of San Quentin Ridge (Area E), in the City of Larkspur.

Our analysis of prevailing wind conditions based on data collected from the Marin Bay park site (approximately 5 miles north) is that the predominant wind pattern is from the south with occasional northerly wind breezes, mainly in winter months. This dominant airflow should minimize any significant impact to neighbors as predominant wind patterns typically blow away from the closest sensitive receptors.

Each day the operator will evaluate onsite odors and evaluate planned operations for the potential to release objectionable odors. If the operator detects an objectionable onsite odor, he will take the following actions:

1. Investigate and determine the likely source of the odor.

2. Determine if onsite management practices could remedy the problem and immediately take steps to remedy the situation.

3. Determine whether or not the odor is traveling beyond the site by patrolling the site perimeter and noting existing wind patterns.

4. Determine whether or not the odor event is significant enough to warrant contacting the adjacent neighbors or the LEA.

In the event of significant odors where a complaint has been filed, the protocol is for the operator to inspect the location of a received complaint. The operator shall attempt to determine if an offensive odor exists and notify the LEA of the complaint and the determination of odor source. In the event that the complaint cannot be verified in this manner, the operator will continue to perform self-monitoring and continue the best management practices (BMPs) described in his operating document. In the event an offensive odor is detected, the operator shall present the LEA with additional or enhanced BMPs to minimize the likelihood of future odor detection.

Front-line MSS staff handling in the in-take of compostable feedstock into the aeration bay will determine before dumping if loads are overly contaminated or odoriferous. These loads may be rejected and re-routed to the transfer station for rapid removal to the landfill. Additionally overly contaminated and/or odoriferous loads entering through public disposal may also be rejected so as to avoid odors and complaints. These loads would be directed to the transfer station and routed to landfill instead.

The practice of moving loads of material during off-peak hours will avoid potential sensitive receptors throughout the day. A wind-sock could be placed to determine wind direction and only move materials during periods of wind that blow away from potential sensitive receptors.

If the control system fails or is ineffective, a misting system may be placed on the canopy to neutralize odors, or the canopy may be further enclosed to ensure a negative pressure during the transfer of materials.

Section 17863.4 (b) (2) - Meteorological Data

The MSS complex is comprised of five (5) adjoining parcels located at the end of Jacoby Street with approximately 82.15 acres in total area. Four (4) parcels are developed and used for MSS operations (Parcels A – D). These parcels are relatively level and comprise 31.28 acres. The fifth parcel (Parcel E) is a densely forested, 50.87 acre, hillside site with an average cross-slope of 39%. MSS also leases a separate 2.78 acre parcel to the west from Golden Gate Bridge Highway and Transportation District. This property is undeveloped, subleased for storage uses, and located across SMART rail right-of-way with access from Jacoby Street.

Climatic conditions in Marin County are not expected to significantly affect the facility operation. Marin County's climate is characterized as Mediterranean with moderate temperatures. These temperatures range from a monthly average low of 41F in January to a monthly average high of 81.6F in July, reported by the Western Regional Climate Center for the period of July 1, 1948 to December 31, 2005 at the San Rafael Civic Center, latitude N37 56' longitude 122 23', elevation 3 feet mean sea level (MSL), which is located approximately 4.4 miles northeast of the facility. Rainfall is seasonal; approximately 91% of the precipitation occurs from November through April. Snowfall is unusual at the site.

The prevailing off-shore wind direction is from the south and occasionally during winter, the northwest. If necessary, the transferring or processing of green and food material will be either curtailed or altered during brief periods of high winds to prevent odors or dust from being transported toward potential receptors.

Section 17863.4 (b) (3) - Complaint Response Protocol

Complaints may be received by either the operator or the LEA.

- The operator receives and reviews the complaint.
- The operator will go to the location of the complaint to assess if the site may be responsible for the odor.
- The operator documents complaints in the site operations log and on the attached complaint form.
- The operator assesses complaint and responds in the on-site log within 24 hours of receiving the complaint, or 48 hours should the citizen complaint be received on a weekend or holiday.
- The operator implements reasonable recommendations suggested by experts or regulatory agencies. The operator will continue operations utilizing best management practices.

- The operator and complainant (if known and choosing to participate) meet within a reasonable timeframe to assess the original problem and results from implementing the recommendations.

- Results and actions must be documented in the site operations log, which serves as the operation's permanent record.

Section 17863.4 (b) (4) - Design Considerations and Procedures to Minimize Odors

Design Consideration;

The current compostable material handling operation within MRRC occurs within an enclosed facility on a concrete pad with limited storage under ambient aeration conditions. There has not been an odor complaint for current operations and the compostable handling operations to take place in MSSTS will be similarly managed.

The following specific design measure will be used at the AD facility to reduce potential odors to less than significant during the pre-digestion, digestion, and removing of digestate phases of the process:

- The aeration bay where the feedstock will be received will be enclosed with a roll-up door. When the doors are opened, the building will be placed on a negative air flow, which will draw any potential odors in that will be exhausted through a biofilter.

- The selected dry fermentation technology does not require upfront grinding, sorting, and screening systems. Reduced processing minimizes odors and emissions. The feedstock material will already be source-separated food waste. The selected technology only requires minimal preparation, if any, for the incoming feedstock and would therefore result in less time in the open air where odor emissions could occur.

- MSS works with generators to limit contamination to ensure that the source-separated organic feedstock does not contain household hazardous waste, glass, metals, or other contamination. MSS will continually add training, awareness, and feedback to their both residential and commercial customers on the need to source-separate their organic materials.

- The anaerobic digesters where the feedstock will be digested will be enclosed with airtight doors. When the doors are opened to move feedstock, the digester will be placed on a negative air flow, which will draw any potential odors in that will be exhausted through a biofilter.

- Many of the emission generating activities would occur in enclosed buildings subject to negative aeration pressure and designed to capture all emissions generated within the enclosure and draw excess atmospheric air into the enclosure to assure no emissions

escape. The ventilation system would then discharge the air to a biofilter for cleaning prior to being emitted to the atmosphere.

- After the digestion process (approximately 21 days), the digestate would be removed from the digesters under negative air flow, resulting in residual gas emissions being captured by the system. The digestate will strategically be moved overnight to ensure sensitive receptors were unable to perceive odors generated during the moving of the digestate.

Biofiltration is a well-known treatment technology that has consistently documented destruction efficiencies of over 90% for volatile organic compounds (VOCs). A pilot-scale experiment conducted at California State University, Fresno, demonstrated a 99% destruction efficiency for VOCs. Tests conducted at the Inland Empire Regional Compost Facility resulted in a measured VOC destruction efficiency of 94%. The South Coast Air Quality Management District (SCAQMD) has published a list of operational biofilters and estimated destruction efficiencies which can be found at:

http://www.aqmd.gov/rules/doc/r1133/app_c_biofilter.pdf.

Additionally, very high destruction efficiencies for methane and nitrous oxide have been demonstrated. A pilot-scale experiment done at California State University, Fresno, demonstrated 99.7% destruction efficiency for methane and 97.1% for nitrous oxide.

Tests conducted at the University of Texas, Arlington, demonstrated 100% removal efficiency for hydrogen sulfide through a biofilter.

For these estimates the following biofilter destruction efficiencies are used:

VOCs:	90%
Ammonia:	80%
Methane:	95%
Nitrous Oxide:	95%
Hydrogen sulfide:	95%

The biofilter will be sized to accommodate the airflow from the aeration vessel and the anaerobic digesters. The biofilter organic media material will be a blend of wood chips and compost; moisture will be maintained to an optimum level to keep the microbes healthy in the filter media. This is a model biolfilter used in the German operations and is typical of biofilters tested in the above-noted studies.

The biofilter media may need to be replaced every 12 to 18 months, and consists of readily available material from overs generated from MSS yard waste collections. During the periods of biofilter maintenance, the doors of the anaerobic digesters will remain closed.

Facility Siting: The siting of the AD Facility and compostable materials handling operations is away from many sensitive receptors, being in a fully enclosed facility on the existing MSS complex. See Attachments 3-5.

Proper Drainage: Standing water is a potential source of odors. The operations area is on a paved surface that is sloped to facilitate drainage and prevent standing water. The paving will be maintained to prevent ponding. General spill control programs and curbing will be in place. The material handling areas are covered by a canopy and protected from storm water. The Aeration Bay and AD cells are all enclosed and protected from storm water.

The loader access area under the canopy to move material from the Aeration Bay to the AD units will be paved and sloped towards a perimeter grated trench drain to capture liquids that may drip from the digestate or material that may spill on the pavement from loading and unloading. The grated trench drain will be drained to the sanitary sewer for treatment.

Personnel training: Personnel will be trained in the proper use of facility equipment. Potential hazards and safety features will be stressed as well as handling procedures to minimize the production of odors, such as leaving roll-up door on the Aeration Bay open unnecessarily. No employee will be permitted to operate equipment until the employee has demonstrated that he or she is competent to operate that equipment. Annual review and training ensuring continued safe operations of the facility and compliance with regulations will be conducted.

Utility service interruptions:

- Electric and Gas: The AD facility is expected to be self-sufficient for power generation; an emergency backup diesel generator may be employed should operational status dictate.
- Telephone: the office staff and the key employees on site utilize cellular telephones and/or radios to communicate and coordinate their daily and routine operating practices.

Section 17863.4 (b) (5) - Operation Considerations and Procedures to Minimize Odors.

Odor Mitigation Measures as part of Operations:

Within the MRRC and the MSSTS, compostable handling operations will occur within an enclosed facility on a concrete pad with limited storage under ambient aeration conditions.

The following specific measures will be used to reduce potential odors from the AD facility to less than significant during the pre-digestion, digestion, and the moving of digestate phases:

- The aeration bay where the feedstock will be received will be enclosed with a roll-up door. When the doors are opened, the building will be placed on a negative air flow, which will draw any potential odors in and the captured air will be exhausted through a biofilter.

- The anaerobic digesters where the feedstock will be digested will be enclosed with air tight doors. When the doors are opened to move feedstock, the digester will be placed on a negative air flow, which will draw any potential odors in that will be exhausted through a biofilter.

- Many of the emission generating activities associated with the anaerobic digestion process would occur in vessel and subject to negative aeration pressure. The digesters are designed to capture all emissions generated within the enclosure and to draw excess atmospheric air into the enclosure to assure no emissions escape. The ventilation system would then discharge the air to a biofilter for cleaning prior to being emitted to the atmosphere.

Section 17863.4 (d) – Annual Review of OIMP

The OIMP will be reviewed annually by the operator and revised as necessary.

A copy of this OIMP will be kept at the facility's administrative office. The OIMP will be revised within 30 days to reflect significant changes to operations that affect the OIMP, with a copy provided to the LEA, when appropriate.

Today's date: ____/____/____

Attachment 1

Control No. ____-_____-____

(year-juris.-#)

ODOR COMPLAINT RESPONSE LOG

Complaint Received From: _____

Name of Complainant: _____

Address: _____

City: _____ Zip code: _____

Phone number: (_____) _____

Facility/Operation Name: _____

SWIS# (if applicable): _____-_____ -_____

Facility Address: _____

City: _____ Zip code: _____

Date Complaint Received (if applicable): _____/_____/_____

Date(s) and Time(s) Alleged Odors Detected: ____/____/____ ___:___AM/PM

Detected by: _____

Description of Alleged Odor(s) and/or Attachments_____

_____

_____

Name of LEA Representative Contacted (if applicable) _____

Date/time LEA Notified: ____/____/____ ___:___AM/PM

Inspection performed by LEA? _____ Other Agencies Present at Inspection? _____

_____

Inspection Resolution/Results (include date) _____

Follow-up:

To Complainant? _____

To Other Agencies? _____

Form Completed By: _____

Signature: _____ Date: ____/____/____

Attach Copy of Complaints or Referral From Other Agencies.

No. 33 October 7, 1996
Publication No. 232-96-009

ODOR COMPLAINT RESPONSE
(at Composting Operations and Facilities)

To All Local Enforcement Agencies

Purpose

This advisory presents strategies for responding to odor complaints at composting operations or facilities. It is a follow-up to LEA Advisory # 32 which focused on the jurisdiction over odor complaints by the Enforcement Agencies' (EA) and the Air Pollution Control Districts' and/or Air Quality Management District (Air District).

To summarize from Advisory # 32, the EA is lead for enforcement regarding odor complaints at composting operations and facilities. The California Environmental Protection Agency recommends an approach whereby the EAs and Air Districts develop working relationships to investigate and coordinate inspections regarding odor complaints. Any composting activities which fall outside of California Integrated Waste Management Board (CIWMB) regulatory requirements pursuant to Title 14, California Code of Regulations (14 CCR), Section 17855 et seq., are under the jurisdiction of the Air District. However, pursuant to 14 CCR, Section 18102, EAs may investigate and take enforcement actions at these activities to verify that they qualify as an excluded operation. EAs may use local nuisance and code enforcement laws, Health and Safety, Penal, or Civil Codes, or refer the odor complaint to the Air District.

Odor Complaint Response

Odors are excessive at a composting operation or facility if they are detected at objectionable levels by the inspector at a property boundary bordered by residences or other sensitive receptors. Please consider these suggestions when developing an EA/Air District compliance and enforcement strategy for responding to complaints.

- Mutual Understanding of Jurisdictional Areas
- Complaint Referral Process
- Documentation of Odor Complaint Response Including Follow-ups
- Solving the Problem

Mutual Understanding of Jurisdictional Areas

EAs are encouraged to prepare for their local Air District a list of all known compost operations, facilities and excluded composting activities so that the Air Districts may either refer a composting odor complaint to the EA or investigate the complaint. A list of all known composting facilities and operations shared within the EA jurisdiction will help to clarify the responsible enforcement agency.

Complaint Referral Process

14 CCR. Section 17867 (a) (2) requires that composting facilities and operations be conducted in a manner that minimizes odor impacts.

This section allows flexibility in determining the appropriate way of dealing with odor impacts at a compost facility or operation. If the EA has received an odor complaint and it is determined to have originated from an excluded activity, the EA should refer the complaint to the local Air District.

If the odor is determined to be derived from a composting facility or operation, the EA may elect to contact the local Air District when conducting an inspection of the site. Air Districts have knowledge of odor mitigation techniques that have proven successful. Some Air Districts may also have the ability to provide the EA with laboratory analysis of odorous air emissions.

Documentation of Odor Complaint Response Including Follow-ups

To assist in maintaining an effective enforcement program for handling odor complaints, EAs may wish to log all odor complaints and referrals received since October 16, 1995. A sample odor complaint response log is included as Attachment 1 of this advisory. EAs utilizing this log should note five unique components to the log:

1) Tracking of Air District odor complaint referrals, and/or a
2) Record of odor complaint in which the complainant contacted the EA directly,
3) Record of whether a multi-agency inspection was performed.
4) Record of inspection resolution and results.
5) Record of inspection follow-ups sent to the complainant and other agencies.

Solving the Problem

Working with the operator in a manner that both achieves compliance and enhances the ability of the facility or operation to process and market organic materials is key to the success of any strategy that is developed for odor complaints. The operator knows the operation and can usually identify changes which would help to reduce odor impacts. Resolution of the problem should be documented. For specific odor mitigation methods, see the selected references included as Attachment 2 of this Advisory.

Summary

Although the primary responsibility to respond to odor complaints from compost operations or facilities lies with the EA, and the responsibility of addressing odor complaints at excluded facilities lies with the Air Districts, this does not preclude either Agency from entering into working relationships to investigate complaints, analyze the source of the complaint, make determinations, and formulate coordinated compliance and enforcement strategies to ensure that performance standards are met. Strategies for enforcement include knowledge of mitigating methods and working with the operator and the local Air District. EAs are encouraged to utilize reference materials developed by industry to aid in mitigating odor problems at compost facilities.