RULE 1133.3 EMISSION REDUCTIONS FROM ~~GREENWASTE~~COMPOSTING OPERATIONS

(a) Purpose

The purpose of this rule is to reduce ~~fugitive~~ emissions of volatile organic compounds (VOC) and ammonia from ~~occurring during greenwaste c~~Composting ~~o~~Operations.

(b) Applicability

This rule applies to ~~the~~ owners and operators of ~~all new and existing greenwaste c~~Composting ~~o~~Operations that are not subject to Rule 1133.2 – Emission Reductions from Co-Composting Operations and excluding Bioreactors with a design capacity of less than 1,000 tons per calendar year.~~that produce active or finished compost from greenwaste by itself or greenwaste in combination with manure or foodwaste, unless otherwise exempted under subdivision (g) of this rule.~~

(c) Definitions

For the purposes of this rule, the following definitions shall apply:

~~(1) ACTIVE COMPOST means material that is in the process of being rapidly decomposed and is biologically unstable. Active compost is generating temperatures of at least 122 degrees Fahrenheit during decomposition. Active compost includes, but is not limited to, pathogen-reduced mulch.~~

(1)~~(2)~~ ACTIVE PHASE is the portion of the composting process characterized by rapid decomposition and biological instability, generating temperatures of at least 122 degrees Fahrenheit (50 degrees Celsius). The Active Phase includes the Pathogen Reduction Process.~~means the phase of the greenwaste composting process that begins when organic waste materials are mixed together for composting and lasts a minimum of 22 days under controlled conditions or until the compost has a Solvita Maturity Index of five or greater measured pursuant to subparagraph (c)(4)(A).~~

(2) AERATION SYSTEM is a system where air is forced through Organic Waste Material being composted, through the use of fans or blowers.

(3) AGRICULTURAL OPERATIONS are defined in Rule 102 – Definition of Terms.

(4)~~(3)~~ BACKYARD COMPOSTING is~~means~~ composting conducted by a household including~~, but not limited to,~~ single family residences, condominiums, duplexes, or apartment buildings.

(5)~~(4)~~ BASELINE EMISSION FACTORS are~~mean~~ the uncontrolled emission factors for ~~greenwaste c~~Composting ~~o~~Operations for VOC and ammonia, respectively.

(6) BIOREACTOR is a fully or partially enclosed vessel primarily constructed of non-earthen materials that facilitates aeration with augers, tumblers, ventilation holes, or blowers to rapidly decompose solid Organic Waste Material, typically in three (3) days or fewer. The composting of Piles with an Aeration System vented to an emission control system is not a Bioreactor.

(7) BIOSOLIDS are the residual solid wastes produced by the anaerobic digestion of sewage and other Organic Waste Material at publicly owned treatment works.

(8)~~(5)~~ COMMUNITY COMPOSTING is~~means~~ composting conducted by a residential neighborhood association using feedstock generated within the residential neighborhood to produce compost for the neighborhood's use.

~~(6) COMPOSTING means a process in which solid organic waste materials are decomposed in the presence of oxygen through the action of bacteria and other microorganisms.~~

(9)~~(7)~~ COMPOST OVERS are~~mean the oversized~~ woody materials that do not decompose in a typical composting cycle and are screened out of ~~f~~Finished Compost~~product~~ at the end of composting. Compost Overs have completed the Pathogen Reduction Process.~~Compost overs have been through the pathogen reduction process outlined in Title 14, Section 17868.3 of the California Code of Regulations.~~

(10) COMPOSTING OPERATION is an operation where solid Organic Waste Material is decomposed in the presence of oxygen through the action of bacteria and other microorganisms.

(11) CONTROL EFFICIENCY is the effectiveness, expressed in percent, of an emission control system or mitigation measure to eliminate, reduce or control the issuance of a specific air contaminant.

(12)~~(8)~~ CURING PHASE is~~means~~ the portion~~phase~~ of the ~~greenwaste~~ composting process that begins immediately after the end of the ~~a~~Active ~~p~~Phase of composting and characterized by slower decomposition until reaching biological stability.~~lasts a minimum of 40 days or until the compost has a Solvita Maturity Index of seven or the product respiration rate is below ten milligrams of oxygen consumed per gram of volatile solids per day as measured by direct respirometry, pursuant to subparagraph (e)(4)(B).~~

(13) DIGESTATE is the residual material produced by the anaerobic digestion of Organic Waste Material excluding sewage or Biosolids.

~~(9) EXISTING GREENWASTE COMPOSTING OPERATIONS mean all greenwaste composting operations that have begun operations on or before July 8, 2011.~~

(14)~~(10)~~ FINISHED COMPOST is~~means~~ a humus-like material ~~and/or compost overs~~ that results from the controlled biological decomposition of ~~o~~Organic ~~w~~Waste ~~m~~Materials and is biologically stable. Both the ~~a~~Active Phase and ~~c~~Curing ~~p~~Phases of ~~the greenwaste~~ composting are required to achieve this product.

(15)~~(11)~~ FOODWASTE is~~means~~ any ~~pre- or post-consumer~~ food scraps collected from the food service industry, grocery stores, or residential food scrap collection. Foodwaste also includes food scraps that are chipped and ground. Food scraps co-collected with curbside Greenwaste collection are considered Greenwaste.

(16)~~(12)~~ GREENWASTE is~~means~~ any ~~organic~~ waste of organic origin ~~material~~ generated from gardening, agriculture, or landscaping activities including~~, but not limited to,~~ grass clippings, leaves, tree and shrub trimmings, and plant remains. Food scraps co-collected with curbside Greenwaste collection are considered Greenwaste. Small woody materials, such as prunings and trimmings up to four (4) inches in diameter, are Greenwaste.

~~(13) GREENWASTE COMPOSTING means composting of greenwaste by itself or a mixture with foodwaste, or with up to 20 percent manure, per pile volume basis.~~

(17) MANURE is the solid waste and soiled bedding produced by livestock and zoological operations from the keeping of animals.

~~(14) NEW GREENWASTE COMPOSTING OPERATIONS mean greenwaste composting operations that have not started operations as of July 8, 2011.~~

(18)~~(15)~~ NURSERY COMPOSTING is~~means~~ composting conducted ~~at a nursery~~ to produce compost for on-site use at a facility where seedlings, young plants, and trees are grown for sale or distribution.

~~(16) ORGANIC WASTE means any organic waste material that includes foodwaste, greenwaste, woodwaste, or manure, or a mixture thereof.~~

(19) ORGANIC WASTE MATERIAL is any waste material of organic origin that may be used as feedstock to produce Finished Compost, Compost Overs, or intermediate material. Organic Waste Material includes Greenwaste, both curbside and non-curbside, Woodwaste, Foodwaste, Biosolids, Digestate, and Manure.

~~(17) OPERATOR means any person that operates a greenwaste composting operation.~~

(20) PATHOGEN REDUCTION PROCESS is the process outlined in Title 14, Section 17868.3 of the California Code of Regulations.

(21)~~(18)~~ PILE is~~means~~ Organic Waste~~compostable~~ ~~m~~Material that is heaped together.

(22)~~(19)~~ RECREATIONAL FACILITY COMPOSTING is~~means~~ composting conducted at parks, arboretums, and other recreational facilities using feedstock generated on-site to produce compost for on-site use.

(23) SCHOOL COMPOSTING is composting conducted at a public or private learning facility to produce compost for the primary purpose of education.

~~(20) SOLVITA MATURITY INDEX means an index that defines the stage where compost exhibits resistance to further decomposition, as tested by the Solvita Maturity Test®.~~

~~(21) START-UP means the first day of active greenwaste composting operations at the facility.~~

(24)~~(22)~~ THROUGHPUT is~~means~~ the mass of Organic Waste Material~~manure, foodwaste, or greenwaste~~ in tons per calendar year as received by the Composting Operation~~facility~~ and processed through composting, excluding recycled materials.

~~(23) TMECC means Test Methods for the Examination of Composting and Compost published by the US Composting Council Research and Education Foundation.~~

(25)~~(24)~~ WOODWASTE is~~means~~ lumber, and the woody material portion of mixed demolition wastes and mixed construction wastes. Large woody materials, such as branches, tree trunks, and stumps exceeding four (4) inches in diameter are Woodwaste.~~Woodwaste also includes large wood materials of curbside greenwaste or mixed greenwaste that is screened or unscreened, such as tree trimmings, branches, tree trunks, stumps, and limbs exceeding two inches in any dimension.~~

(26) WINDROW COMPOSTING is the process in which Organic Waste Material is placed in elongated Piles and are mechanically turned on a periodic basis.

(d) Requirements

(1) ~~Effective July 8, 2011, t~~The owner or operator of a ~~greenwaste c~~Composting ~~o~~Operation~~s~~ shall ~~comply with the following requirements~~:

(A) Chip or grind, as necessary, and use Organic Waste Material~~greenwaste~~ for on-site composting as allowed by the Local Enforcement Agency.

(B) Use ~~f~~Foodwaste for on-site composting within 48 hours of receipt or cover ~~f~~Foodwaste with ~~screened or unscreened f~~Finished ~~c~~Compost or Compost Overs until used, unless otherwise required by the Local Enforcement Agency.

(C) Conduct the Active Phase:

(i) For Composting Operations processing more than 5,000 tons of Foodwaste per calendar year, for all Piles containing more than ten

(10) percent Foodwaste, by weight, by using an Aeration System that is vented to an emission control system in accordance with paragraph (d)(3).

(ii) For all other Piles and all other Composting Operations, either by Windrow Composting in accordance with paragraph (d)(2) or by using an Aeration System vented to an emission control system in accordance with paragraph (d)(3).

(D) Conduct the Active Phase until meeting at least one of the following criteria:

(i) For a minimum of 22 consecutive calendar days, beginning when Organic Waste Material is mixed together for composting.

(ii) The Active Phase Pile has a Compost Maturity Index of 4.5 or greater as measured by the Solvita Maturity Test in accordance with subparagraph (e)(4)(A).

(iii) The Active Phase Pile has completed the Pathogen Reduction Process.

(E) Conduct the Curing Phase until meeting at least one of the following criteria:

(i) For a minimum of 40 consecutive calendar days after the end of the Active Phase.

(ii) The Curing Phase Pile has a Compost Maturity Index of 6.0 or greater as measured by the Solvita Maturity Test in accordance with subparagraph (e)(4)(A).

(iii) The Curing Phase Pile respiration rate is below ten (10) milligrams of oxygen consumed per gram of volatile solids per day as measured by direct respirometry in accordance with subparagraph (e)(4)(B).

(2) Windrow Composting Best Management Practices

~~Effective upon start-up for new greenwaste composting operations and effective November 8, 2011 for existing greenwaste composting operations, t~~The owner or operator of a ~~greenwaste c~~Composting ~~o~~Operation~~s~~ conducting the Active Phase of composting by Windrow Composting shall~~processing greenwaste only or up to 20 percent manure, by volume, or up to 5,000 tons per year of foodwaste throughput shall comply with the following requirements~~:

(A) Cover each ~~a~~Active ~~p~~Phase ~~p~~Pile with ~~screened or unscreened f~~Finished ~~c~~Compost or Compost Overs within 24~~twenty-four~~ hours of initial ~~p~~Pile formation such that the top of the cover is at least six (6) inches thick~~. and~~

~~the pile shall not be turned for the first seven days of the active phase of composting, unless subparagraph (d)(2)(D) applies.~~

(B) Within six (6) hours before turning ~~F~~for at least the first 15~~fifteen~~ days after initial Active Phase ~~p~~Pile formation~~ for the active phase period of composting, within six hours before turning~~, apply water or other liquid approved by the Executive Officer ~~as necessary~~ to the surface area of each ~~a~~Active ~~p~~Phase ~~p~~Pile until~~such that~~ the top one-half of the Active Phase ~~p~~Pile is sufficiently wet to~~at~~ a depth of at least three (3) inches. ~~Alternatively, the operator may apply water during turning using a windrow turner which is equipped with water spraying technology during the entire windrow turning process.~~

(i) ~~For the purpose of this subparagraph, "wet"~~ The owner or operator shall ~~be~~ determine~~d~~ if an Active Phase Pile is sufficiently wet by the~~means of a~~ squeeze ball test pursuant to clause (d)(2)(B)(ii) or an alternative approved by the Executive Officer, California Air Resources Board (CARB), or~~and~~ the United States Environmental Protection Agency (U.S. EPA).

(ii) Squeeze Ball Test

The owner or operator ~~The ball test~~ shall take~~be conducted by taking~~ a sample of ~~the compostable~~ material while wearing a protective glove from the top one-half of the Active Phase ~~p~~Pile, at least three (3) inches below the outer surface. The owner or operator shall~~material should be~~ squeeze~~d~~ the sample into a ball using hand pressure~~ and wearing a protective glove~~. An Active Phase Pile is sufficiently wet if the sample~~There should be at least enough water to~~ form~~s~~ a ball when compressed, but the ball may break when tapped.

(iii) If the ball crumbles upon release of ~~the~~ hand pressure, the owner or operator shall apply additional approved liquid~~water~~ to the Active Phase Pile~~windrow~~ prior to turning until the Active Phase Pile is sufficiently wet~~material passes the ball test~~.

(iv)~~(C)~~ If a rain event occurs ~~prior to watering the pile~~ within six (6) hours before turning an Active Phase Pile and the Active Phase ~~p~~Pile is sufficiently wet~~ to a depth of three inches~~, the owner or operator may turn the Active Phase ~~p~~Pile without adding additional approved liquid~~water~~. If the ~~top half of the~~ Active Phase ~~p~~Pile is not

sufficiently wet~~dry to the three inch depth~~, the owner or operator shall apply additional approved liquid~~water~~ to the Active Phase ~~p~~Pile pursuant to clause~~subparagraph~~ (d)(2)(B)(iii) before turning.

(C)~~(D)~~ In lieu of complying with the requirement of subparagraph (d)(2)(B), the owner or operator may turn Active Phase Piles using a windrow turner equipped with liquid spraying technology that applies approved liquid during the entire turning process.~~If the pile needs to be turned within the first seven days for managing temperature or pathogen reduction pursuant to Title 14 Division 7, Chapter 3.1, Section 17868.3 of the California Code of Regulations, the operator does not need to re-apply the screened or unscreened finished compost cover and shall apply water pursuant to subparagraph (d)(2)(B) for the first fifteen days of the active phase.~~

(D)~~(E)~~ The owner or operator may implement an alternate mitigation measure ~~that will be~~ based on a test protocol approved by the Executive Officer, CARB~~California Air Resources Board~~, or~~and~~ ~~the~~ U.S. EPA~~United States Environmental Protection Agency and~~ that either~~demonstrates~~:

(1) Meets a Control Efficiency~~emission reductions by at least~~ equal to or greater than 40 percent, by weight, for VOC emissions and ~~emission reductions by at least~~ equal to or greater than 20 percent, by weight, for ammonia emissions; or~~ for combined screened or unscreened finished compost cover and water application.~~

(2) Does not exceed 2.97 lbs VOC emissions per ton of Throughput and does not exceed 0.57 lbs ammonia emissions per ton of Throughput.

(3) Aeration System Vented to Emission Control System

~~Effective July 8, 2011, t~~The owner or operator of a ~~greenwaste c~~Composting ~~o~~Operations ~~processing greater than 5,000 tons per year of foodwaste throughput~~ conducting the Active Phase of composting using an Aeration System vented to an emission control system shall ~~comply with the following requirements, for the purpose of regulatory compliance~~:

(A) Use ~~Any active phase of composting containing more than 10 percent foodwaste, by weight, shall be conducted using~~ an emission control system~~device~~ designed and operated that, either:

(i) Meets~~with a~~ ~~an overall system~~ ~~c~~Control ~~e~~Efficiency ~~of at least~~ equal to or greater than 80 percent, by weight, ~~each~~ for VOC emissions and equal to or greater than 80 percent, by weight, for ammonia emissions, as compared to one of:~~.~~

(I) Inlet emission rates for VOC and ammonia, respectively, to the emission control system;

(II) Baseline Emission Factors of 4.25 pounds of VOC per ton of Throughput and 0.46 pounds of ammonia per ton of Throughput, respectively; or

(III) Operation-specific Baseline Emission Factors for VOC and ammonia, respectively, if submitted by the owner or operator and approved by the Executive Officer to represent the uncontrolled emission factors of the Active Phase of the Composting Operation; or

(ii) Does not exceed 0.85 lbs VOC emissions per ton of Throughput and does not exceed 0.092 lbs ammonia emissions per ton of Throughput.

(B) Demonstrate compliance with subparagraph (d)(3)(A), as applicable, by source testing in accordance with paragraph (e)(1):

(i) Within one (1) year of startup of the emission control system; and

(ii) Every three (3) years thereafter.

(C) Install, operate, and maintain the emission control system in accordance with the manufacturer's operation and maintenance manual or other similar written materials supplied by the manufacturer or distributor to ensure that the emission control system remains in proper operating condition.

~~(B) The operator may implement a control alternative if the alternative is approved by the Executive Officer, California Air Resources Board, and the United States Environmental Protection Agency, to achieve VOC and ammonia reductions that are greater than or equal to the reductions required pursuant to subparagraph (d)(3)(A).~~

~~(C) For new greenwaste composting operations that intend to compost greater than 5,000 tons per year of foodwaste throughput, a permit shall be obtained for an emission control device, as specified in subparagraph (d)(3)(A) or (d)(3)(B), prior to construction.~~

~~The annual throughput calculation may exclude any non-putrescible materials, including, but not limited to paper, woody, other low-water, high cellulose materials, and non-compostable contaminants and green waste that are separated either before or after composting and shipped off-site for disposal provided they are quantified and appropriate records are maintained for.~~

~~(4) No later than October 10, 2011, for existing greenwaste composting operations that, as of July 8, 2011, process or plan to process greater than 5,000 tons per year of foodwaste throughput, the operator shall file a permit application for an emission control device and fully implement the emission control device in accordance with subparagraphs (d)(3)(A) or (d)(3)(B) within six months upon approval of the permit application.~~

~~(5) The overall control efficiency required in subparagraph (d)(3)(A) shall be demonstrated by a source test within three months after implementation of the emission control device, or within nine months of permit approval, whichever occurs sooner, and every three years thereafter. For the purpose of this rule, the baseline emission factors to be used shall be 4.25 pounds of VOC per ton of throughput and 0.46 pounds of ammonia per ton of throughput for the active phase of composting only. The Executive Officer may approve the use of alternate baseline emission factors, if the operator demonstrates through the approved source test that alternate baseline emission factors are representative of uncontrolled operations for that facility~~

~~(6) All emission control devices shall be installed, operated, and maintained in accordance with the manufacturer's operation and maintenance manual or other similar written materials supplied by the manufacturer or distributor of such equipment to ensure that the system remains in proper operating conditions. Such documentation shall be made available to the Executive Officer upon request.~~

~~(7) All records, including application of screened or unscreened finished compost and water, operation and maintenance of an emission control device, and source tests, shall be kept and maintained at the facility pursuant to subdivision (f).~~

(e) Test Methods and Protocol

(1) Source Testing~~For a greenwaste composting operation subject to paragraphs (d)(3) through (d)(5), the operator shall conduct all required source and laboratory tests in accordance with an Executive Officer approved test protocol developed in accordance with the guidelines provided in Attachment A of this rule.~~

The owner or operator of a Composting Operation required to perform source testing shall:

(A) Prior to conducting source testing to demonstrate compliance, submit a source test protocol for approval to the Executive Officer in accordance with the guidelines provided in Attachment A;

(B) Submit an updated or new source test protocol if there are any changes to the emission control system or if the Executive Officer requests an updated or new source test protocol;

(C) Conduct source testing pursuant to the valid source test protocol approved by the Executive Officer; and

(D) Submit the source test report to the Executive Officer within 60 days of completing all sampling for source testing.

(2) ~~For a greenwaste composting operation subject to paragraphs (d)(3) through (d)(5), t~~The owner or operator of the Composting Operation shall use a ~~District approved~~ laboratory approved by the Executive Officer for all required testing.~~in accordance with the Attachment A of this rule.~~

(3) The following methods shall be used to determine compliance ~~with this rule~~:

(A) South Coast ~~SC~~AQMD Method 207.1 – Determination of Ammonia Emissions from Stationary Sources.

(B) South Coast ~~SC~~AQMD Method 25.3 – Determination of Low Concentration Non-Methane Non-Ethane Organic Compound Emissions from Clean Fueled Combustion Sources.

(C) South Coast ~~SC~~AQMD Method 1.1 – Sample and Velocity Traverses for Stationary Sources.

(D) South Coast ~~SC~~AQMD Method 1.2 – Sample and Velocity Traverse~~Traverses~~ for Stationary Sources with Small Stacks and Ducts.

(E) South Coast ~~SC~~AQMD Method 2.1 – Determination of Stack Gas Velocity and Volumetric Flow Rate (S-Type Pitot Tube).

(F) South Coast ~~SC~~AQMD Method 2.2 – Direct Measurement of Gas Volume through Pipes and Small Ducts.

(G) South Coast ~~SC~~AQMD Method 2.3 – Determination of Gas Velocity and Volumetric Flow Rate from Small Stacks or Ducts.

(H) South Coast ~~SC~~AQMD Method 4.1 – Determination of Moisture Content in Stack Gases.

(4) Triplicate samples shall be taken for the following test methods:

(A) Test Methods for the Examination of Composting and Compost (TMECC) 05.08-E – Solvita Maturity Index (April 7, 2002) or its successor.

(B) TMECC 05.08-A – Specific Oxygen Uptake Rate (April 7, 2002) or its successor.

(f) Recordkeeping

The owner or operator of a Composting Operation shall:

(1) Maintain the following records, as applicable:

(A) A copy of the annual Composting Operation report submitted in accordance with subdivision (g);

(B) Records of dates and amounts of composting conducted;

(C) Application of Finished Compost, Compost Overs, and approved liquids, in accordance with paragraph (d)(2);

(D) Source test reports, in accordance with subparagraph (e)(1)(D);

(E) Operation and maintenance of any emission control system, in accordance with paragraph (d)(3); and

(F) Manufacturer's operation and maintenance manual or similar, in accordance with paragraph (d)(3).

(2) Maintain records for the prior five (5) years of operation. The most recent two (2) years shall be retained on-site, which shall be immediately available upon request by the Executive Officer. The remaining three (3) years of records shall be made available to the Executive Officer within one (1) week of request.

~~Records shall be kept in a format approved by the Executive Officer.All operational records and information recorded pursuant to the provisions of this rule shall be maintained for the prior five years of operation, with the most recent two years retained at the facility, which shall be immediately available upon request by the Executive Officer. The remaining three years of records shall be made available to the Executive Officer within one week of request.~~

(g) Reporting

The owner or operator of a Composting Operation shall submit to the Executive Officer annually, no later than July 1st of each calendar year, a report summarizing the Composting Operation of the previous calendar year in a format approved by the Executive Officer. The report shall include annual Throughputs of each Organic Waste Material received and annual Throughputs of Finished Compost and Compost Overs.

(h)~~(g)~~ Exemptions

~~(1) Composting facilities subject to Rule 1133.2 – Emission Reductions from Co-Composting Operations, are exempt from the provisions of this rule.~~

~~(2) If the operator of any greenwaste composting operation installs an emission control device, in accordance with paragraphs (d)(3) through (d)(6), the provisions of paragraph (d)(2) do not apply.~~

(1)~~(3)~~ The owner or operator of any of ~~T~~the following types of Composting ~~facilities and o~~Operations shall be~~are~~ exempt from the provisions of subdivisions (d) through (g)~~requirements of this rule~~, provided that the Composting ~~o~~Operation is not subject to the Local Enforcement Agency Notification or Permit regulations pursuant to Title 14 Division 7, Chapter 3.1, Section 17857.1 of the California Code of Regulations:

(A) Community ~~c~~Composting.~~;~~

(B) Nursery ~~c~~Composting.~~;~~

(C) Backyard ~~c~~Composting.~~; and~~

(D) Recreational ~~f~~Facility ~~c~~Composting.

(E) School Composting.

(F) Agricultural Operation.

(2) The owner or operator of a Composting Operation with a Throughput of less than 100 tons per calendar year shall be exempt from the provisions of subdivisions (d) through (g), except for subparagraph (f)(1)(B) to record Throughput and paragraph (f)(2) to maintain records.

ATTACHMENT A

GUIDELINES FOR THE DEVELOPMENT OF SOURCE TEST PROTOCOLS FOR VOC AND AMMONIA EMISSIONS FROM ~~GREENWASTE~~ COMPOSTING OPERATIONS

Source test protocols are to consist of testing plans to measure VOC and ammonia emissions due to the composting process. When used for determining the emission control system~~device~~ Control ~~e~~Efficiency ~~requirement specified for new and existing facilities~~, the measurements shall consist of lb/hr measurements at the inlet and exhaust of the emission control system~~device~~ and are subject to the applicable requirements that follow. When used for determining the Control Efficiency~~overall emission reduction~~ requirements as compared to the ~~b~~Baseline ~~e~~Emissions ~~f~~Factors, emissions are to be reported as % reductions for the ~~a~~Active ~~p~~Phase ~~composting~~ in terms of pounds of emissions per ton of ~~t~~Throughput (total raw material as received) and are subject to the applicable requirements that follow. The following are general requirements for all testing as well as specific requirements for the rule sections for each facility-specific protocol which must be prepared by the source test contractor and approved by the South Coast ~~SC~~AQMD prior to testing. Source test protocols are facility-specific, reflecting the unique conditions and configuration of each Composting Operation and may vary from these guidelines. Any such deviations from test method(s) must be approved by South Coast AQMD in the source test protocols.

1. Alternative Test Methods

The reference test methods for ammonia, VOC, and flow rate cited in this guideline shall be used to determine compliance with this rule. Alternative test methods may be used if they are determined to be equivalent and approved in writing by the Executive Officer, CARB~~the California Air Resources Board~~, ~~and~~or U.S. EPA ~~the U.S. Environmental Protection Agency~~. For the source test protocols, as defined as the manner in which the reference test methods are employed to obtain a measurement of the emissions, alternatives to the procedures cited in these~~this~~ guidelines may be used if they are determined to be equivalent and approved in writing by the Executive Officer.

2. LAP Requirements

The sampling, analysis, and reporting shall be conducted by a laboratory/source test firm that has been approved under the South Coast ~~SC~~AQMD Laboratory Approval Program (LAP) for the cited South Coast ~~SC~~AQMD reference test methods, where LAP approval is available. For South Coast ~~SC~~AQMD reference test methods for which no LAP program is available, the LAP approval requirement shall become effective one (1) year after the date that the LAP program becomes available for that South Coast ~~SC~~AQMD reference test method.

3. Operating Conditions

The testing must be conducted under representative operating conditions with respect to seasonal conditions, compost composition, process ~~t~~Throughput, processing of the materials, and ~~p~~Pile geometries. The following operating parameters shall be recorded during testing and reported with the test results:

a) A thorough description of the composting process and process diagram of each processing area and including residence times in each of the composting process areas.
b) Process ~~t~~Throughput as determined by facility's billing scales or other calibrated measuring device that represents the tons of the material as received that is present at the facility during the time of the testing. When using the South Coast AQMD~~District~~ Baseline Emission Factors, the process ~~t~~Throughput is to include all of the raw ~~o~~Organic Waste ~~m~~Materials that are composted excluding material that is recycled from previous similar processing. Several ~~t~~Throughputs may be necessary if applicable to the different processing areas or ~~p~~Pile ages.
c) Compost composition (percent and type of Organic Waste ~~m~~Material~~s~~ i.e. ~~m~~Manure, ~~g~~Greenwaste, ~~f~~Foodwaste, etc…).
d) Age of all ~~p~~Piles that were tested and all ~~p~~Piles present at the facility during testing, with age expressed in either calendar days or Compost Maturity Index as measured by the Solvita Maturity Test in accordance with subparagraph (e)(4)(A).
e) Detailed dimensions of all ~~p~~Piles or the biofilter so that a surface area for each ~~p~~Pile type can be calculated.
f) A description of the biofilter system, including a process diagram and type of biofilter media.
g) Age of the biofilter media.
h) A thorough description of the humidification and moisture maintenance system for the biofilter.
i) Identification of peripheral monitoring equipment, such as moisture or temperature sensors, and data from them during testing.

4. Ammonia Sampling

South Coast ~~SC~~AQMD Method 207.1 shall be used to obtain the ammonia samples from each source of emissions to be tested. When sampling from a flux chamber, a sample line of minimal length should be connected to a midget sampling train consisting of; two (2) midget impingers each filled with 15 mL~~l~~ of 0.1N ~~S~~sulfuric ~~A~~acid, an empty impinger~~bubbler~~, and an impinger~~bubbler~~ filled with tared silica gel. The samples shall be analyzed for ammonium content as ammonia by ion chromatography or ion selective electrode.

5. VOC Sampling

Duplicate integrated gas samples shall be taken from each source of emissions to be tested using South Coast ~~SC~~AQMD Method 25.3. ~~The~~ South Coast AQMD Method 25.3 apparatus should be connected to sample directly inside the flux chamber or duct as applicable. Compost emissions are considered as water soluble sources where the 50 ppm applicability limit of South Coast AQMD Method 25.3 does not apply.

6. Specific Requirements for Testing ~~Greenwaste~~ Composting Operations Control Equipment Performance

For surface types of emissions, such as with open faced biofilter exhausts, the exhaust emission rate shall be determined as in accordance with ~~in the following~~ Section (8) below.

For an emission control system~~device~~ inlet or exhaust that is vented through a testable duct, the gas velocity within the duct shall be measured according to South Coast ~~SC~~AQMD Methods 1.1, 2.1, and 3.1. The flow rate shall also be corrected to dry standard conditions using the moisture content as determined by South Coast ~~SC~~AQMD Method 4.1. This flow rate may then be used to determine mass emission rates.

~~The overall destruction~~Control ~~e~~Efficiency shall be~~is~~ calculated as follows:

$$CE\text{~~ODE~~} = 100 \times (1 - (E / I)) \quad \text{(Equation 1)}$$

Where:

CE~~ODE~~ = ~~Overall Destruction~~Control Efficiency (%)
E = Total Exhaust Emission Rate (lb/hr)
I = Total Inlet Emission Rate to Emission Control System~~Device~~ (lb/hr)

7. Specific Requirements for ~~Existing Greenwaste~~ Composting Operations (Baseline Emission Factors)~~and New Greenwaste Composting Operations (Overall Emissions Reduction)~~

A proposed measurement from the ~~a~~Active Phase~~greenwaste composting process~~, including ~~but not limited to~~ surface emissions of all ~~p~~Piles where the materials are composted, and outlets (vents or surfaces) of emission control systems~~devices~~ must be included in the protocol. If the emissions are vented to atmosphere from a vent stack such as from an otherwise uncontrolled aerated static ~~p~~Pile or other vent to atmosphere, then the stack concentration, determined using methods specified in Sections (4) and (5) and flow rate measurements as specified in ~~the previous~~ Section (6) are required. From all surface types of emissions such as from compost ~~p~~Piles and biofilter surfaces, the procedure for measuring surface emissions as specified in Section (8) is required. A measurement for fugitive emissions from aerated static ~~p~~Pile surfaces must also be included.

Each type of ~~p~~Pile must be tested. If the facility includes several identical ~~p~~Piles, then only the largest ~~p~~Pile need be tested. If the facility has more than three (3) different age ~~p~~Piles that are otherwise identical in processing and composition, then at a minimum three (3) ages can be tested including newer, middle-aged, and older~~, and middle aged~~ ~~p~~Piles from the Active Phase. A newer Pile in the Active Phase has not yet achieved peak temperature and is typically less than seven (7) days old or has a Compost Maturity Index (CMI) of 1.5 or less as measured by the Solvita Maturity Test in accordance with subparagraph (e)(4)(A). A middle-aged Pile in the Active Phase has achieved peak temperature and is typically between seven (7) and 14 days old or has a CMI between 1.5 and 3.0. An older Pile in the Active Phase has decreasing temperature and is typically between 14 and 22 days old or has a CMI between 3.0 and 4.5. In any case, the surface area of all

~~p~~Piles at the facility must be included in the determination of ~~p~~Pile dimensions as ~~recorded~~ specified in Section (3).

If the facility elects to use an alternative to the South Coast AQMD~~District~~'s ~~b~~Baseline ~~e~~Emissions ~~f~~Factors, then a separate test must be conducted to establish this baseline on the uncontrolled composting operation (e.g., windrow method) with the same compost mix. Following the source test to determine ~~an~~ alternative ~~b~~Baseline Emission Factors, facilities would have the option to use the South Coast AQMD~~District~~'s ~~b~~Baseline ~~e~~Emissions ~~f~~Factors or the alternative ~~b~~Baseline ~~e~~Emissions ~~f~~Factors.

Control Efficiency~~Reduction of emissions~~ shall be calculated as follows:

$$\textit{CE\% Reduction} = 100 \times (1 - (TE / B)) \qquad \text{(Equation 2)}$$

Where:

CE = Control Efficiency (%)
TE = Total Active ~~and Curing~~ Phase Emissions (lb/ton ~~t~~Throughput)
B = South Coast AQMD~~District~~ Baseline Emission~~s~~ Factors or Alternative Baseline Emission~~s~~ Factors if Tested (lb/ton ~~t~~Throughput)

8. Procedure for Measuring Surface Emissions

The procedure for measuring surface emissions such as the compost ~~p~~Pile and biofilter surfaces that cannot be tested by conventional methods through a stack or duct, is a modified form of the procedures found in the ~~US Environmental Protection Agency's (~~U.S. EPA~~)~~ *Measurement of Gaseous Emission Rates from Land Surfaces Using an Emission Isolation Flux Chamber User's Guide* (U.S. EPA Guide). The modifications to the procedures in the U.S. EPA Guide are~~is~~ specified in the following requirements.

The flux chamber encompasses a fixed surface area of 1.4 ft^2 and contains a sweep air system to obtain a homogeneous air sample by employing a mixing fan and sweep gas (10% helium~~He~~ in air at 5 liters/min recommended). The sweep gas must contain a non-~~-~~reactive and non-present tracer such as the aforementioned 10% helium so that a correction for the contribution of the surface flow rate can be calculated.

A minimum of six (6)~~ten (10)~~ sample locations per Pile or a sufficient number at each ~~p~~Pile~~/surface~~ tested must be obtained in order to achieve a representative sample of the Pile surface emissions. A minimum of four (4) Piles at each Composting Operation (a newer Pile, a middle-aged Pile, an older Pile, and a pile in Curing Phase), or a sufficient number of Piles at the Composting Operation must be tested to represent the Composting Operation surface emissions. These locations can be composited for each ~~p~~Pile~~/surface~~ to reduce testing costs. For example, for one (1) hour sampling, six (6)~~ten (10)~~ random positions on the ~~p~~Pile should be tested for ten (10)~~6~~ minutes each. Alternatively, a lesser number of sample locations may be sampled provided that an evaluation of spatial variation demonstrates that the number of sample locations is sufficient.

The emissions shall~~must~~ be reported in units of lb/hr-ft^2, lb/hr, and lb/ton of ~~t~~Throughput. The following calculations shall apply to the test results:

$$\textit{Surface Flow Correction Factor} = C_t / C_s \quad \text{(Equation 3)}$$

Where:

C_t = Concentration of Tracer in Sweep Gas
C_s = Concentration of Sweep Gas in Flux Chamber Sample

$$\textit{Corrected Flux Chamber Results (lb/hr-ft}^2\textit{)} = \textit{UFC x SFCF} \quad \text{(Equation 4)}$$

Where:

UFC = Uncorrected Flux Chamber Results (lb/hr-ft^2)
SFCF = Surface Flow Correction Factor

$$\textit{lb/hr} = \textit{lb/hr-ft}^2 \textit{ x Total Compost Surface Area in Category} \quad \text{(Equation 5)}$$

$$\textit{lb/ton t Throughput} = \textit{lb/hr x (24 hr/day) / PT} \quad \text{(Equation 6)}$$

Where:

PT = Process Throughput (total ton/day as received)

$$\textit{Total Emissions (lb/ton t Throughput)} = \sum P \quad \text{(Equation 7)}$$

Where:

P = Active Phase and ~~c~~Curing Phase~~sources~~ of the Facility Compost Emissions (lb/ton ~~t~~Throughput)

For a facility where not every age of ~~p~~Pile was tested, the surface areas from each ~~p~~Pile in the facility must be included and sorted into appropriate age (newer, middle-aged, older in the Active Phase) and emissions categories (Active Phase and Curing Phase) from those that were measured.