



VENTURA COUNTY FIRE PROTECTION DISTRICT  
FIRE PREVENTION BUREAU  
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(805) 389-9738

## STANDARD 14.9.1

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### COMPOSTING, MULCH AND ORGANIC PROCESSING (Ref: Ventura County Fire Code, Section 2808)

*The information contained in this standard is provided solely for the convenience of the reader and was being enforced by the Ventura County Fire Protection District at the time of its publication. The District reserves the right to make changes and improvements to this standard as and when required by law, or otherwise, at any time. (The District's current standards will be posted and made available for downloading by the public at the following web site: <http://fire.countyofventura.org>.)*

*Please note that the District assumes no liability for any damages incurred directly or indirectly as a result of any errors, omissions, or discrepancies between this standard and any applicable law. It is the sole responsibility of the person or persons conducting any work pursuant to this standard to ensure their work complies with any and all applicable codes, ordinances, and regulations.*

#### CHAPTER 1 ADMINISTRATION

**1.1 Scope.** This standard is the approved requirements of the fire code official under Ventura County Fire Code (VCFC), Section 2808. This standard applies to processing, storage and application of composting, mulch and organic materials for on-site generators, commercial facilities and normal agricultural activities. It also applies to chipping and grinding operations of compostable materials. This standard shall be used in conjunction with CalRecycle (formally California Integrated Waste Management Board), Ventura County Resource Management Agency (RMA) (Planning & Environmental Health Divisions), Ventura County Agricultural Commissioner, VCFC, Ventura County Ordinance Code (VCOC) and other applicable Laws, Regulations, Rules and Codes including incorporated Cities,(if applicable). Where any conflict occurs with the requirements of this standard and other Laws, Regulations, Rules and Codes, the most restrictive application shall apply, unless prohibited by Law.

**1.2 Purpose.** This standard was developed to address the concerns and issues associated with fires within or spreading from or to composting, mulch and organic processing and the hazards this poses to emergency responders, the surrounding communities and the wildland area. It is intended to provide basic built in fire safety measures for small users less than 200 cubic yards and address the concerns for larger users and facilities exceeding 200 cubic yards.

**1.3 Responsibility.** All individuals and companies who intend to engage in the processing or handling of composting, mulch and organic materials are subject to the requirements of the VCFC and this standard.

**1.4 Permits.** An annual VCFC permit shall be obtained by the property owner or operator when required by VCFC, Section 105.6.48. A permit is not required for legitimate agricultural operations on agricultural land meeting the requirements of this standard, unless approval has been granted for spreading depths or pile sizes exceeding the limits within this standard. A permit is not required for land application of less than 200 cubic yards per calendar year and in compliance with this standard.

**VCFC, Section 105.6.48 Miscellaneous combustible compost, composting, green waste, mulch, organic processing and yard waste.** An operational permit is required to store in any building or upon any premises, in excess of 200 cubic yards gross volume of combustible composting, green waste, mulch, organic processing, yard waste, or similar combustible material. See VCFC, Section 2808. Exception: On-site storage for normal agricultural operation in conformance with VCFC, Section 2808.1.2

**1.5 Modifications.** Increases in the limitations of this standard may be considered on a case by case basis provided a written request and justification based upon site-specific conditions prepared by a qualified expert acceptable to the County Agricultural Commissioner's Office (if applicable) and the fire code official, is submitted to and approved in writing by, the County Agricultural Commissioner's Office (if applicable) and the fire code official, prior to storage, processing and land application. Such written requests shall be made by both the property owner of record and the purchaser or user of the compostable material or mulch, if separate. Additional measures to prevent the ignition and spread of fire shall be provided as approved by the fire code official.

## CHAPTER 2 DEFINITIONS

**2.1 General.** The following words and terms shall, for the purposes of this standard and permit requirements of the VCFC, have the meanings shown herein.

**2.2 Agricultural Land.** As defined by VCOC, Section 4701.

**2.3 Application.** "Application" or "land application" shall mean the spreading of compostable material, compost, or mulch on land at the end user location.

**2.4 Chipping and Grinding Operation.** "Chipping and grinding operation(s)" shall mean any activity where compostable material is mechanically reduced (chipped or ground) and where such activity is subject to regulatory compliance by any regulation or standard, whether or not a solid waste permit is required.

**2.5 Compost and Compostable Material.** "Compost" and "Compostable Material" shall mean any organic material that when accumulated is capable of rapid decomposition and generating temperatures of at least 122 degrees Fahrenheit.

**2.6 Contaminants.** "Contaminants" shall mean pieces of non-compostable solid waste that include, but are not limited to, plastics, metals, glass, clothing, wood containing lead-based paint or wood preservatives, and other similar materials. Ref: VCOC Sec 4701

**2.7 Disposal.** As defined by VCOC, Section 4701

**2.8 Legitimate and Agronomically Beneficial Agricultural Operations.** As determined and classified by the Agricultural Commissioner or his authorized representative.

**2.9 Mulch.** "Mulch" shall mean compostable material limited to landscape waste and crop production byproducts consisting of leaves, grass clippings, weeds, yard trimmings, wood waste, branches and stumps, and whole plants/trees, that have been mechanically reduced in size, whether composted or not.

**2.10 Recyclable Material.** "Recyclable material" shall mean any type of material that would otherwise become solid waste but, instead, is or may be recycled, as defined in the Public Resources Code, Section 40180 as "recycle" and shall include material that is commingled or source separated; including compostable materials.

**2.11 Tipping Area.** "Tipping area" is a designated area within a facility that is used to receive raw feedstock material that has not been processed.

**2.12** For purposes of this standard, the terms **Fire Hazard Severity Zones (FHSZ), Hazardous Fire Area (HFA), State Responsibility Area (SRA), and Wildland-Urban Interface (WUI) Area**, shall be as defined in Chapter 2 of the Ventura County Fire Code (VCFC).

**HAZARDOUS FIRE AREA (HFA)** is land which is covered with grass, grain, brush, or forest, whether privately or publicly owned, which is so situated or is of such inaccessible location that a fire originating upon such land would present an abnormally difficult job of suppression or would result in great and unusual damage through fire or resulting erosion and includes any location within 500 feet of a forest or brush, grass, or grain covered land, exclusive of small individual lots or parcels of land located outside of a brush, forest grass, or grain covered area.. Such areas are designated by the fire code official. The fire code official is authorized to utilize, as references, the definition of Wildland-Urban Interface Area, State SRA maps, Local Agency Fire Hazard Severity Zone Maps designated pursuant to California Government Code, Sections 51175 through 51189 and the International Wildland-Urban Interface Code.

### CHAPTER 3 GENERAL REQUIREMENTS

**3.1 WUI Area.** For the purposes of this standard, WUI Areas shall be as designated by the Fire District, and shall include at a minimum all areas of a HFA area. The area may be increased based upon site conditions.

**3.2 Land Application Under 200 Cubic Yards Annually.** Land application of less than 200 cubic yards per calendar year shall comply with Section 5.2 and any local, City or County regulations.

**3.3 Fire Protection Plan (FPP).** The owner or operator shall prepare a FPP for any facilities processing and/or storing over 200 cubic yards and all commercial facilities. The FPP shall address monitoring for, controlling and extinguishing fires. The FPP shall be submitted to the fire code official, County of Ventura RMA and if applicable, the Agriculture Commission Office, for review and approval.

***Exception:** On-site storage for normal agricultural operation in conformance with this Standard.*

**3.4 Fire Protection Plan Contents.** The FPP shall include the following:

- (1) A scaled (20 or 40) and dimensioned site plan indicating property lines, buildings, access roads, fire hydrants, location of tipping areas, piles and push out area.
- (2) Available fire flow (if from a purveyor) or location and size of water tanks (if no purveyor).
- (3) Monitoring procedures for pile temperature and moisture content.
- (4) Fire suppression methods.
- (5) Other procedures and methods to reduce fire within piles.
- (6) Methods to control contaminants and contaminant storage / disposal procedures.
- (7) Employee training.
- (8) Equipment and resources available on-site for fire prevention / suppression.
- (9) Thresholds for calling 9-1-1.

(10) Reports and other justifications if requesting to exceed this standard.

**3.5 Address Numbers.** Properties or facilities subject to a VCFC permit shall post address numbers prior to occupancy or use. Address numbers shall be on an elevated post at the driveway entrance and at any other location to clearly indicate direction to the property or facility. Numbers shall be a minimum of 10 inches high, of contrasting color to the background and readily visible at night. Brass or gold plated numbers shall not be used. (See Fire Prevention Standard 14.4.1)

**3.6 Disposal.** Storage, processing and application of compost, compostable material, mulch, and combustible yard waste not in accordance with this standard and the VCFC is a fire hazard and may be subject to removal utilizing the provisions of VCFC, Section 304 and VCFC, Appendix W.

**3.7 Height Limits.** All height limits for feedstock, processing areas and storage piles are to be measured as it exists when received, processed or placed into piles. Land application of mulch is to be measured after one week of settling.

**3.8 Records.** Records of delivery manifests (both incoming and outgoing) and percentage of contaminant certifications shall be maintained on-site or at a location approved by the fire code official for a period of 3 years and shall be subject to review by the fire code official upon request.

## CHAPTER 4 STORAGE & PROCESSING

**4.1 Internal Temperatures.** Internal temperatures of all piles exceeding six (6) feet in height at any location shall be monitored daily. Piles under six (6) feet shall be monitored at least once every 7 days. Temperature measurements shall be taken every 50 feet along the pile length at a depth of 24-36 inches. If any pile's internal temperature exceeds 160 degrees Fahrenheit at any location, immediate action shall be taken to reduce and maintain the temperature below 160°F.

**4.2 Contaminants.** Contaminants shall not exceed one percent (1.0%) of total volume of each pile of compostable material or mulch, including feedstock piles. Contaminant level in piles intended for land application within Ventura County shall comply with Section 5.1.2.

**4.3 Delivery & Tipping Area.** Feedstock and raw materials shall be placed into designated tipping areas or piles upon delivery and shall comply with all storage requirements for compost and mulch.

**4.3.2 Tipping Area.** A maximum of two (2) designated tipping areas may be provided at a single facility and shall be shown on the approved facility site plan. Tipping areas shall comply with the following:

**4.3.2.1 Size.** Tipping areas shall not exceed a maximum area of 50 feet by 50 feet.

**4.3.2.2 Height.** Material within a tipping area shall not exceed five (5) feet in height at any time.

**4.3.2.3 Separation.** Tipping areas shall be separated from all piles and other tipping area by a minimum 20 foot wide fire access lane.

**4.3.2.4 Fire Hydrant.** A fire hydrant or approved fire water supply outlet shall be located within 150 feet of all edges of the tipping area.

**4.3.2.5 Time Limit.** All material within a tipping area shall be processed within five (5) days of receipt or shall be placed into piles complying with Section 4.4.

**4.4 Pile Size.** Pile size shall not exceed the limits of **Table 4.4** based upon the aggregate amount of materials on-site at any one facility or parcel.

**Table 4.4 Maximum Pile Size base upon aggregate amounts on-site at any one facility.**

Aggregate Amount (Cubic Yards)	Maximum Size (Cubic Yards)	Maximum Height (Feet)	Maximum Length (Feet)	Maximum Width (Feet)
200 or less	10	6	No Limit	No Limit
Over 200	1500	12	150	25

**4.5 Pile Separation Distance.** Piles shall be separated from other piles or row piles as follows:

**4.5.1 20 cubic yards or less.** Piles shall be separated a minimum of 10 feet. (See Exhibit B and C for examples of pile size calculations)

**4.5.2 Over 20 cubic yards.** Piles shall be separated a minimum of 15 feet between pile rows and a minimum 20 feet at required cross aisles. (See Exhibit B and C for examples of pile size calculations)

**4.6 Maximum grid of piles and rows.** Rows of piles shall not exceed 500 feet by 500 feet. Grids shall be separated by a minimum 50 foot wide clear space used for no other purpose.

*Exception: Push out area and fire protection equipment as approved by the fire code official.*

A.1 **Pile separation from Building(s).** Piles shall be separated from building(s) in accordance with **Table 4.7.**

**Table 4.7 Minimum Pile Separation from Building(s) (feet) based on location**

Pile Size (Cubic Yards)	SRA, FHSZ, HFA or WUI Area	All Other Areas
20 or less	100 feet	10 feet
Over 20	100 feet	30 feet

A.1 **Pile Separation from Combustible Vegetation.** Piles shall be separated from combustible vegetation in accordance with **Table 4.8.**

**Table 4.8 Minimum Pile Separation from Combustible Vegetation (feet) based on location**

Pile Size (Cubic Yards)	SRA, FHSZ, HFA or WUI Area	All Other Areas
10 or less	10 feet	10
Over 10 to 200 max 5 piles in grid	20 feet	10
Over 200 or over 5 piles in grid	50-100feet*	30 feet

\* As determined by fire code official based upon site review.

**4.9 Push-Out/Clear Area.** Piles exceeding 20 cubic yards shall be provided with push-out areas. Push-out areas shall be maintained clear at all times to allow for the largest pile to be spread out to a depth of 2 feet. Push-Out areas shall be located within 250 feet of all edges of any pile and shall be located a minimum of 20 feet from any building.

**4.10 Property Line Set Backs.** Piles shall be separated from property lines a minimum of 10 feet. Increased set back distances may be required by local Zoning regulations.

**4.11 Fire Flow/Water Supplies.** Facilities with over 200 cubic yards shall provide a water supply. The minimum fire flow shall be no less than 500 GPM @ 20 PSIR for a minimum of one (1) hour duration for pile heights up to six (feet) and two (2) hour duration for pile heights over six (feet). If there is no water purveyor, an alternate water supply with storage tank(s) shall be provided for fire suppression. The water supply tank(s) shall provide a minimum capacity of 2500 gallons per pile (maximum 30,000 gallons) for piles not exceeding six (6) feet in height and 5000 gallons per pile (maximum 60,000) for piles exceeding six (6) feet in height. Water tank(s) shall not be used for any other purpose unless the required fire flow is left in reserve within the tank at all times. An approved method shall be provided to maintain the required amount of water within the tank(s).

**4.12 Fire Hydrant(s).** When a water supply is required by Section 4.11, fire hydrant(s) with at least one (1) 2-1/2 inch NST male outlet shall be located within 600 feet of all pile edges (1200 foot spacing). Fire hydrant(s) shall be set back a minimum of 20 feet from any pile. When using an on-site water storage tank, required fire hydrant(s) may be located on the tank. Signs, minimum of 4 inch high letters, shall be posted at all fire hydrant outlets stating "WATER FOR FIRE DEPARTMENT USE ONLY".

**4.13 Fire Department Access Roads.** Facilities with over 200 cubic yards shall provide a minimum, most weather, 20 foot wide fire department access road extending to and around the perimeter of all pile grids shall be provided. Cross aisle access width of a minimum 20 feet shall be provided. The access road shall be of sufficient width to allow for a 40 foot inside turning radius at all turns in the road. All access roads shall have a vertical clearance of thirteen feet six inches (13' 6") when located in non-SRA area and fifteen feet zero inches (15' 0") if located within the SRA.

**4.14 Turnarounds.** Approved turnaround areas for fire apparatus shall be provided when dead-end Fire Department access roads exceed 150 feet. Turnaround areas shall not exceed a 5% cross slope in any direction and shall be located within 150 feet of the end of the access road.

**4.15 Material-handling Equipment.** Facilities with over 200 cubic yards shall have an approved material-handling equipment shall be available on-site for moving and pushing out piles exceeding internal temperatures limitations and during fire-fighting operations.

## CHAPTER 5 AGRICULTURAL OPERATIONS AND LAND APPLICATION

### 5.1 Storage.

**5.1.1 Temporary Pile Storage for Land Application.** Temporary pile storage for land application associated with normal agricultural operations shall not exceed the time limitations as specified within VCOC Section 4704. Temporary pile storage shall comply with all requirements of Sections 4.7; 4.8; 4.10 and 4.14 for pile storage and this Chapter.

**5.1.2 Contaminants – Piles for Land Application.** Contaminants shall not exceed one-tenth of one percent (0.1%) of total volume of each pile of compostable material and mulch being stored for land application.

**5.1.3 Delivery for Land Application.** Mulch delivered to a parcel for land application shall be placed into piles complying with this standard.

**5.1.4 Pile Size.** Piles sizes for temporary storage shall comply with Sections 5.1.4.1 and 5.1.4.2.

**5.1.4.1 Agricultural Land.** Piles or windrows shall not exceed six (6) feet in height, 16 feet wide at the base, and no longer than 300 feet (150 feet in SRA, FHSZ, HFA or WUI area). Temporary piles exceeding the height or width requirements of this section shall require a Fire Code permit and is subject to all requirements of VCFC Section 2808 and this standard.

**5.1.4.2 Non-Agricultural Land.** The maximum amount of material on any parcel shall not exceed 200 cubic yards. Piles shall not exceed six (6) feet in height and 10 cubic yards per pile.

**5.1.5 Pile Separation Distance.** Pile separation distance shall be a minimum of 15 feet between adjacent piles. Crops and orchard trees may be planted within area between piles as long as fire department access roads are provided in accordance with Section 5.1.6. Separation from buildings shall comply with Sec 4.7.

**5.1.6 Fire Department Access Roads.** A minimum, most weather, fire department access road shall be provided in accordance with **Table 5.1.6**. The access road shall be of sufficient width to allow for a

40 foot inside turning radius at all turns in the road. All access roads shall have a vertical clearance of thirteen feet six inches (13' 6") when located in non-SRA area and fifteen feet zero inches (15' 0") if located within the SRA area

**Table 5.1.6 Fire Access Roads**

Fire Access Road	SRA, FHSZ, HFA or WUI Area	All Other Areas
Width:	15 feet	10-12 feet
Distance to all portions of any pile:	75 feet	150 feet

**5.1.7 Push-Out/Clear Area.** Approved push-out or clear areas shall be provided for temporary pile storage exceeding thirty (30) days and when piles are over 100 cubic yards in size. Push-out/clear areas may be areas around orchard trees and within rows between crops and orchard trees. The intent is to provide areas to spread piles and move unburned material away from a pile in the event of fire within the pile. Push-out/clear areas shall be located within a reasonable distance to the storage area but not more than 500 feet and shall be not located within of 20 feet of any building.

**5.1.8 Water Supply –Temporary Pile Storage for Land Application.** An approved water supply shall be provided for temporary pile storage exceeding thirty (30) days and when there is over 5000 cubic yards aggregate material within a single storage zone. Piles separated by a minimum of 250 feet may be considered within separate storage zones for purpose of this section. If water tanks are used, the amount shall be 1500 gallons per pile (maximum 20,000 gallons). Use of on-site irrigation water supply and connections or water trucks normally kept on the same site (parcel) of the pile storage may be used when approved by the fire code official. Type and location of water supply outlets/connections shall be approved by the fire code official.

**5.1.9 Material-handling Equipment.** Approved material-handling equipment shall be available on-site, or at a location approved by the fire code official for moving and pushing out piles exceeding internal temperatures limitations and during fire-fighting operations.

**5.1.10 Notification of Temporary Piles for Land Application.** The property owner and/or tenant shall notify the Fire Prevention Division in writing when temporary pile storage exceeds 5000 cubic yards upon any parcel. The notification shall be on the VCFPD Form #13.6.11 and includes: Assessor parcel number, property address and/or location, property owner, tenant (if applicable), contact phone number, estimate of amount of material that will be stored prior to application, estimated application time frame. Temporary pile storage is subject to random site review by the fire code official.

**5.2 Land Application.**

**5.2.1 Land Application Average Depth Limitations.** The land application depth limitations shall be the average depth measure in a 10 foot by 10 foot area. The depth limitation includes the combination of any existing material and new material upon the ground.

**5.2.3 Land Application in HFA and WUI Areas.** Land Application shall not exceed an average three (3) inches in depth within HFA areas and WUI areas.

**5.2.4 Land Application in All Other Areas.** Land application in all other areas shall not exceed the limitations as specified within VCOC Section 4704.

**5.2.5 Land Application within Defensible Space.** Land application within 100 feet of any structure is subject to VCFC Appendix W, Fire Hazard Abatement, requirements and shall not exceed the following average depth limitations listed in **Table 5.2.5.**

**Table 5.2.5 Land Application Limitations within Defensible Space of a Structure**

<b>Distance to Structure</b>	<b>Average depth Limitation</b>
Less than 30 feet	See Standard 14.9.2
30 – 100 feet	3 inches*

\*Must have an agronomically beneficial agricultural use. Otherwise see Standard 14.9.2

**5.2.6 Land Application Combustible Vegetation Set Back.** Land application is prohibited within 10 feet of combustible vegetation within HFA and WUI areas.

**5.2.7 Contaminants.** Contaminants during land application shall not exceed amounts as specified under VCOC, Section 4701-13(b) and 4704(a) as measured in any 10 foot by 10 foot area.

## **CHAPTER 6 REFERENCE ITEMS**

**6.1 California Code of Regulations.** For the purpose of clarity, the following definitions are reprinted from California Code of Regulations (CCR) Title 14, Chapter 3.1. They are current as of the date of this standard.

### **Section 17852. (a).**

(A) "Active Compost" means compost feedstock that is in the process of being rapidly decomposed and is unstable. Active compost is generating temperatures of at least 50 degrees Celsius (122 degrees Fahrenheit) during decomposition; or is releasing carbon dioxide at a rate of at least 15 milligrams per gram of compost per day, or the equivalent of oxygen uptake.

(5) "Agricultural Material" means material of plant or animal origin, which result from the production and processing of farm, ranch, agricultural, horticultural, aquacultural, silvicultural, floricultural, vermicultural, or viticultural products, including manures, orchard and vineyard pruning's, and crop residues.

(6) "Agricultural Material Composting Operation" means an operation that produces compost from green or agricultural additives, and/or amendments.

(10) "Chipping and Grinding Operations and Facilities" means an operation or facility that does not produce compost that mechanically reduces the size or otherwise engages in the handling, of compostable material and:

(A) The site does the following:

1. The site handles only material, excluding manure, allowed at a green material composting operation or facility as set forth in section 17852(a)(22); and
2. Each load of green material is removed from the site within 48 hours of receipt. The EA may allow a site to keep green material on-site for up to 7 days if the EA determines that the additional time does not increase the potential for violations of this Chapter.

(B) If the site fails to meet the definition of green material because it exceeds the contamination limits in section 17852(a) (21), the site shall be regulated as set forth in the Transfer/Processing Regulatory requirements (commencing at section 17400).

(C) If the site fails to meet the definition of this section because the green material remains on-site for a longer period of time than allowed, then the site shall be regulated as a compostable material handling operation or facility, as set forth in this Chapter.

(11) "Compostable Material" means any organic material that when accumulated will become active compost as defined in section 17852(a) (1).



(19) "Feedstock" means any compostable material used in the production of compost or chipped and ground material including, but not limited to, agricultural material, green material, food material, biosolids, and mixed solid waste. Feedstock shall not be considered as either additives or amendments.

(21) "Green Material" means any plant material that is separated at the point of generation, contains no greater than 1.0 percent of physical contaminants by weight, and meets the requirements of section 17868.5. Green material includes, but is not limited to, yard trimmings, untreated wood wastes, natural fiber products, and construction and demolition wood waste. Green material does not include food material, biosolids, mixed solid waste, material processed from commingled collection, wood containing lead-based paint or wood preservative, mixed construction or mixed demolition debris. (36) "Stabilized Compost" means any organic material that has undergone "the Process to Further Reduce Pathogens (PFRP)", as described in section 17868.3, and has reached a stage of reduced biological activity as indicated by reduced temperature and rate of respiration below that of active compost.

**6.2 Public Resource Code.** For the purpose of clarity, the following definitions are reprinted from the California Public Resource Code (PRC). They are current as of the date of this standard.

40116. "Compost" means the product resulting from the controlled biological decomposition of organic wastes that are source separated from the municipal solid waste stream, or which are separated at a centralized facility. "Compost" includes vegetable, yard, and wood wastes which are not hazardous waste.

40116.1. "Composting" means the controlled or uncontrolled biological decomposition of organic wastes.

40140. "Hazard" includes any condition, practice, or procedure which is or may be dangerous, harmful, or perilous to employees, property, neighbors, or the general public.

40172. "Processing" means the reduction, separation, recovery, conversion, or recycling of solid waste.

**6.3 Web Sites.** The following are web sites that may provide additional information regarding composting and mulch. They are current as of the date of this standard.

<http://www.calrecycle.ca.gov/Laws/Regulations/Title14/ch31.htm>

<http://www.calrecycle.ca.gov/SWFacilities/Permitting/FacilityType/Compost/default.htm>

<http://www.calrecycle.ca.gov/SWFacilities/Permitting/FacilityType/Compost/default.htm#Resources>

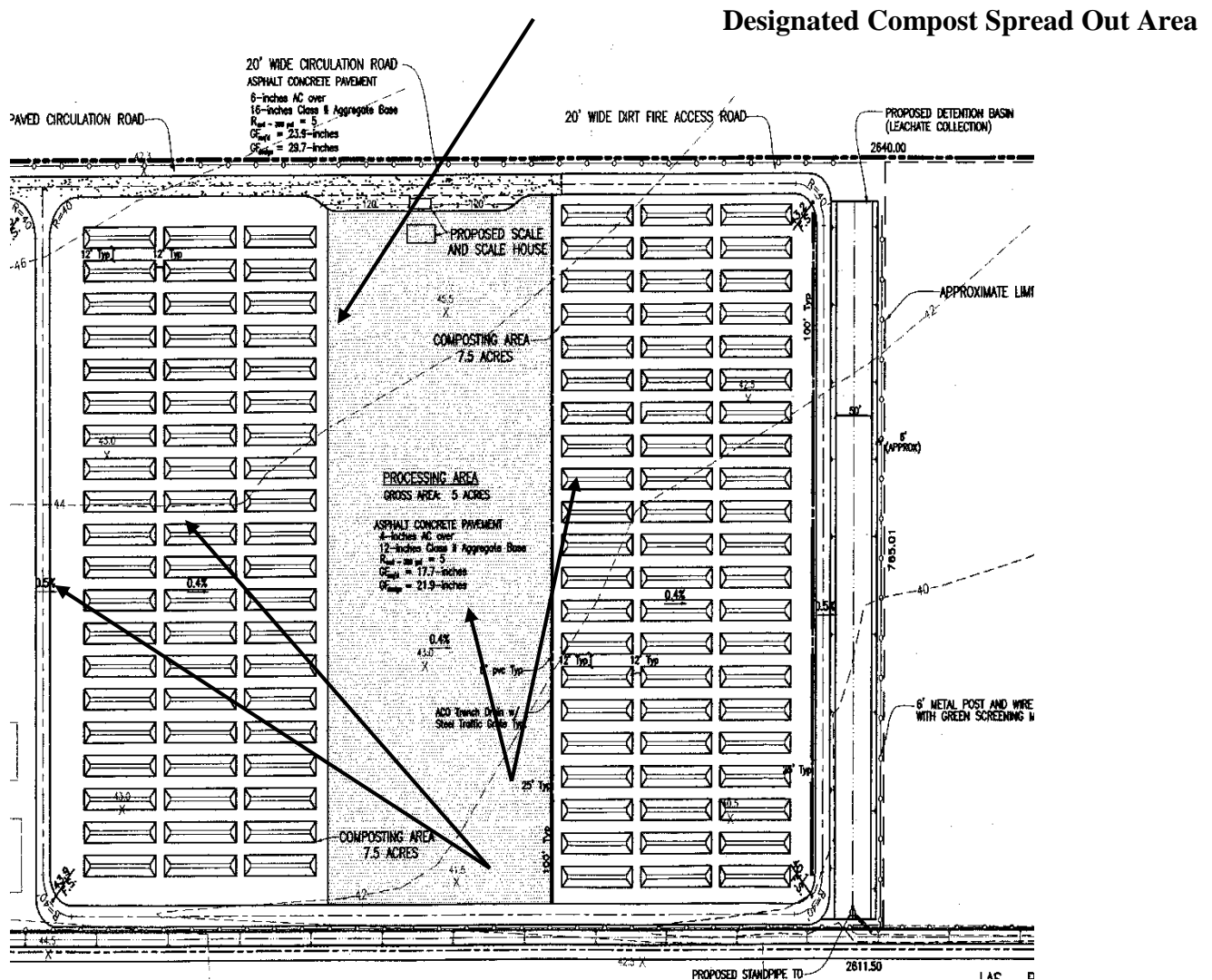
<http://www.calrecycle.ca.gov/LEA/Mail/2004/CompostFires.htm>

[http://frap.cdf.ca.gov/webdata/maps/ventura/fhszs\\_map.56.pdf](http://frap.cdf.ca.gov/webdata/maps/ventura/fhszs_map.56.pdf)

## EXHIBIT A

### Sample Layout Diagram and Sample Pile Measure & Calculation Diagrams

Note: This diagram is not to scale and is shown for reference purposes only. Pile sizes, number and locations shall comply with the requirements of this standard.



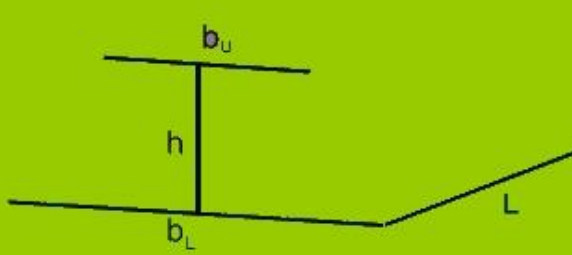
**Minimum 15 foot access width between piles**

**Minimum 20 foot access width along perimeter and cross aisles**

## EXHIBIT B

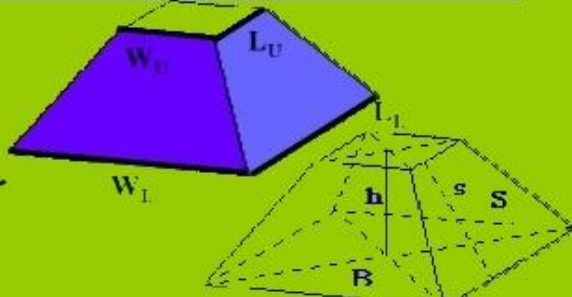
### Sample Pile Size Calculations

#### Trapezoidal Windrows



**Volume =  $h \times L \times \frac{1}{2}(b_L + b_U)$**

#### Square Pyramid Frustum Stockpiles



**Volume =  $h(L_L \times W_L) + (L_U \times W_U) + \text{sqrt}(L_L \times W_L \times L_U \times W_U) / 3$**

<b>Site Name:</b>	<b>Date:</b>
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h = Height (ft)	6
b <sub>U</sub> = Width (ft) <sub>U</sub>	11
b <sub>L</sub> = Width (ft) <sub>L</sub>	16
L = Length (ft)	150
<b>Volume in yds<sup>3</sup></b>	<b>450</b>
Number of Piles	
Total Volume	#VALUE!

h = Height (ft)	6
W <sub>U</sub> = Width (ft) <sub>U</sub>	2
W <sub>L</sub> = Width (ft) <sub>L</sub>	10
L <sub>U</sub> = Length (ft) <sub>U</sub>	2
L <sub>L</sub> = Length (ft) <sub>L</sub>	10
<b>Volume in yds<sup>3</sup></b>	<b>4</b>
Number of Piles	
Total Volume	0

h = Height (ft)	6
b <sub>U</sub> = Width (ft) <sub>U</sub>	18
b <sub>L</sub> = Width (ft) <sub>L</sub>	25
L = Length (ft)	150
<b>Volume in yds<sup>3</sup></b>	<b>716.667</b>
Number of Piles	
Total Volume	0

h = Height (ft)	
W <sub>U</sub> = Width (ft) <sub>U</sub>	
W <sub>L</sub> = Width (ft) <sub>L</sub>	
L <sub>U</sub> = Length (ft) <sub>U</sub>	
L <sub>L</sub> = Length (ft) <sub>L</sub>	
<b>Volume in yds<sup>3</sup></b>	<b>0</b>
Number of Piles	
Total Volume	0

h = Height (ft)	12
b <sub>U</sub> = Width (ft) <sub>U</sub>	20
b <sub>L</sub> = Width (ft) <sub>L</sub>	25
L = Length (ft)	150
<b>Volume in yds<sup>3</sup></b>	<b>1500</b>
Number of Piles	
Total Volume	0

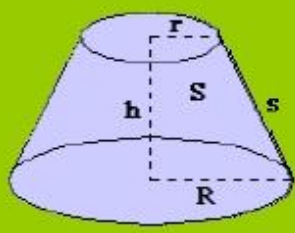
h = Height (ft)	
W <sub>U</sub> = Width (ft) <sub>U</sub>	
W <sub>L</sub> = Width (ft) <sub>L</sub>	
L <sub>U</sub> = Length (ft) <sub>U</sub>	
L <sub>L</sub> = Length (ft) <sub>L</sub>	
<b>Volume in yds<sup>3</sup></b>	<b>0</b>
Number of Piles	
Total Volume	0

h = Height (ft)	12
b <sub>U</sub> = Width (ft) <sub>U</sub>	20
b <sub>L</sub> = Width (ft) <sub>L</sub>	25
L = Length (ft)	150
Volume in yds <sup>3</sup>	1500
Number of Piles	
Total Volume	0

## EXHIBIT C

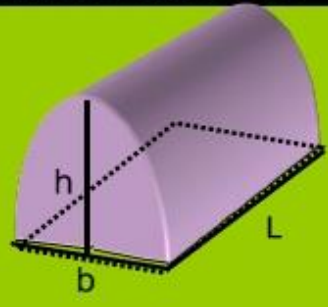
### Sample Pile Size Calculations

#### Conical Compost Piles



**Volume =  $\pi(R^2 + Rr + r^2)h/3$**

#### Parabolic Compost Piles



**Volume =  $2/3 \times b \times h \times L$**

h = Height (ft)	6
r = Radius (ft) <sub>U</sub>	2
R = Radius (ft) <sub>L</sub>	6
<b>Volume in yds<sup>3</sup></b>	<b>10.23926</b>
Number of Piles	
Total Volume	0

h = Height (ft)	6
V = Volume in yds <sup>3</sup>	350
b = Base (ft) <sub>L</sub>	16
<b>Length In Feet</b>	<b>147.6563</b>
Number of Piles	
Total Volume	0

h = Height (ft)	6
r = Radius (ft) <sub>U</sub>	2
R = Radius (ft) <sub>L</sub>	5
<b>Volume in yds<sup>3</sup></b>	<b>7.446738</b>
Number of Piles	
Total Volume	0

h = Height (ft)	6
V = Volume in yds <sup>3</sup>	300
b = Base (ft) <sub>L</sub>	16
<b>Length In Feet</b>	<b>126.5625</b>
Number of Piles	
Total Volume	0

h = Height (ft)	
r = Radius (ft) <sub>U</sub>	
R = Radius (ft) <sub>L</sub>	
<b>Volume in yds<sup>3</sup></b>	<b>0</b>
Number of Piles	
Total Volume	0

h = Height (ft)	6
V = Volume in yds <sup>3</sup>	200
b = Base (ft) <sub>L</sub>	16
<b>Length In Feet</b>	<b>84.375</b>
Number of Piles	
Total Volume	0

h = Height (ft)	
r = Radius (ft) <sub>U</sub>	
R = Radius (ft) <sub>L</sub>	
<b>Volume in yds<sup>3</sup></b>	<b>0</b>
Number of Piles	
Total Volume	0

h = Height (ft)	12
V = Volume in yds <sup>3</sup>	1500
b = Base (ft) <sub>L</sub>	25
<b>Length In Feet</b>	<b>202.5</b>
Number of Piles	
Total Volume	0