Research Findings:

Compost Regulation Review

A Review of Regulations Affecting Composting and Compost Operations in California

People, Food & Land Foundation
Nourishing Land, Empowering Communities

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Funded by
The Schmidt Family Foundation
John Wick
Peggy Rathmann

Supported by Calla Rose Ostrander

Reserach and Writing by Stephanie Cain

Special thanks to the following for providing information and insight during the writing and research collection process:

California Alliance for Community Composting: Kourtnii Brown
California Compost Coalition: Neil Edgar
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The Regulatory Process of Compost: A Review

Composting operations are considered a significant piece of infrastructure with major land use implications. Consequently, multiple sets of regulations prescribe authorizations for establishing new sites. Regulatory hurdles for composters can exist in the form of overlapping permits, local zoning ordinances, inspection programs governing different environmental impacts, municipal health codes, and state laws. Obtaining the permits involved with establishing composting operations greater than 100 cubic yards is time-consuming and sometimes prohibitively expensive, and increasingly so the larger the facility is. This section aims to clarify the existing regulatory hurdles specific to compost creation as it currently stands for the state of California.

There are five main governing bodies that regulate compost operations:

1. Local planning and zoning departments
2. Local enforcement agencies
3. California Department of Resources, Recycling and Recovery (CalRecycle)
4. California State Water Resource and Control Board (Water Boards)
5. Regional Air Pollution and Control Districts (Air Districts).

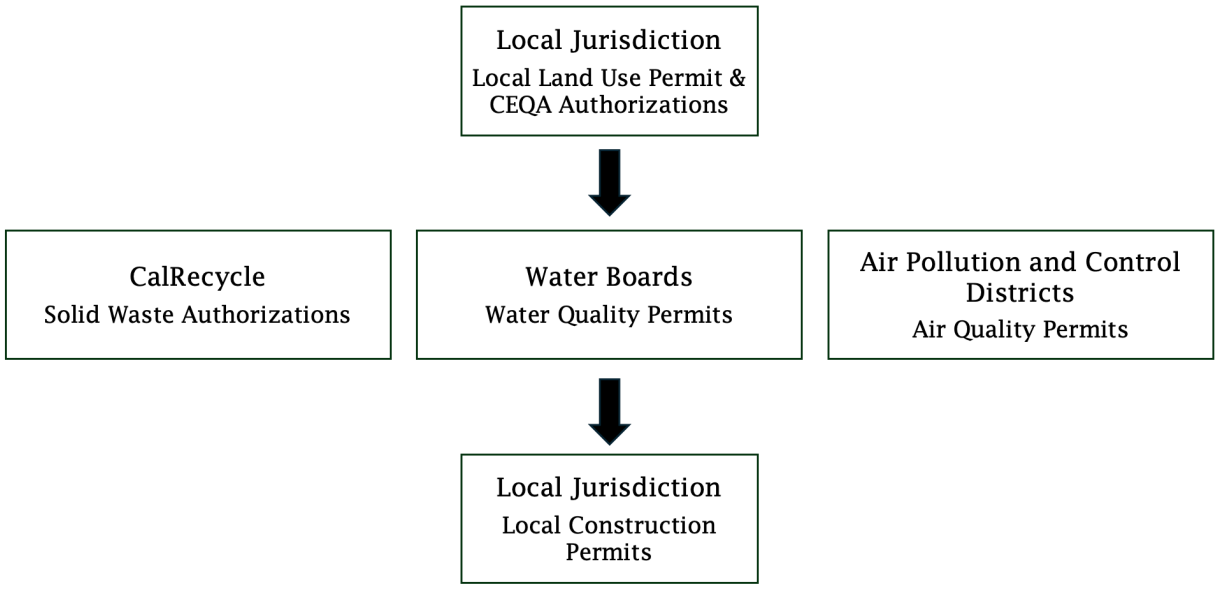

Table 1: Regulatory Agencies' Permitting Protocol for New Composting Operations.

Adapted from CalRecycle's Small/Medium Composting Project Permitting

Each of these entities, shown in Table 1, has its own requirements for approving and monitoring the operation of organic material processing facilities. Each governing body's requirements reflect their specific interests and often differ. Despite attempts to provide resources and support regarding their permitting processes and associated costs, the matrix of operating standards, feedstock limits, and potential mitigation requirements create a significant cost and time barrier to entry for new composting operations.

The major approval processes required for a composting operation are as follows:

1. Local Jurisdiction Land Use & CEQA Approvals (and later construction permits)
2. CalRecycle Solid Waste Authorizations
3. Water Board Water Quality Permits
4. Air Pollution and Control District Air Quality Permits

Gaining all the required approvals may not happen in order and can vary based on the size and priorities of the operation, making it a highly site-specific process (source: CR small/medium). Navigating these requirements for fully registered facilities requires time, upfront capital, and a deep understanding of the bureaucratic processes of the many regulatory agencies involved. Without a comprehensive grasp of the obstacles involved, the permitting process can be inhibitory for individuals and organizations attempting to enter the market, as well as the jurisdictions planning for compost creation. By knowing what regulatory barriers aspiring compost facility operators face, planners can set up local policies to better streamline infrastructure development that can help improve diversion rates through more local and regional composting capacity.

I. Local Land Use & California Environmental Quality Act (CEQA) Approvals

Composting operations are first subject to the rules of local land use and zoning codes and then, after receiving all necessary approvals, the final construction permits. Zoning is the process of parceling out a city or county into different sections called ‘zones’; often categorized under themes such as residential, commercial, agricultural, industrial, and so on. Each of these zones allow certain uses to occur in those mapped areas, either as a matter of right (if the use is listed within the zoning codes) or through acquiring a specific permit (minor use permit, conditional use permit, major use permit, etc). Which uses are allowed or permitted under each zone is predominantly up to the city or county themselves and relies on their specific definitions of each use.

Historically, zoning practices have aimed to protect neighboring communities from ‘nuisance,’ the loosely defined concept that “a man shall not use his property so as to harm another” (source). Nuisances often associated with any organics material recovery operation may include odors, dust, noise, runoff, and pests. The fear of these nuisances spilling over into neighboring residential or commercial areas has led the majority of zoning laws to limit where stand-alone compost facilities can exist, how big they can get, and what kind of materials they can manage and process from off-site. Additionally, local zoning codes often don’t have specific language regarding composting as a potential stand-alone or accessory land use, which leads to composting operations being categorized under industrial activities as solid waste facilities and, therefore, subjected to more stringent regulations and limited permissible zone and activities (source). Local land use requirements often have the longest lead time and are a prerequisite to securing the remaining approvals from other enforcement agencies (CR small/medium).

The California Environmental Quality Act (CEQA) is the state’s process to disclose and minimize environmental damage that may arise from any project that is either subject to discretionary approval or has the potential to alter the environment. The CEQA

process can be complex and generally requires a preliminary review, preparation of an initial study, and generation of either a Negative Declaration, a Mitigated Negative Declaration, or an Environmental Impact Report, depending on the extent of the potential environmental impacts. These documents often include required mitigation measures to reduce overall ecological impact.

Typical Land Use Authorizations for Composting Operations

For a composting site to begin operations without a land use approval, composting must be specifically listed as an approved land use or allowed by right under a city or county's zoning code in any or all zones. Generally, however, zoning codes lack specific language that allows for "stand-alone" or "accessory use" composting activities, which may require composters to apply for project-specific land use approval. The most common land use approval a composter will apply for is a Conditional Use Permit (CUP), which allows a city or county to consider special uses that may be essential or desirable to the community but are not allowed as a "matter of right"(source). This zoning approval, whether granted with a CUP or other required land use permit, usually triggers the CEQA process, which can cost up to $12,000 and take multiple years to complete.

CEQA processes vary depending on the size and impact of the proposed composting activity. Some small composting operations can operate without CEQA documentation, while others may require CEQA clearance documents such as Negative Declarations, Mitigated Negative Declarations, or Environmental Impact Reports. According to CalRecycle, mitigation measures for composting operations generally aim to reduce impacts on air quality, geology, hydrology and water quality, noise, and odor. A CUP may also include specific conditions and best management practices that the operation must comply with to reduce these common threats to environmental health. These conditions may reflect the CEQA documents' environmental impact mitigation standards or be stand-alone conditions regarding compliance with administrative and regulatory requirements for that jurisdiction.

Challenges with Current Land Use Approval Process

The primary challenge in obtaining local land use approvals for composting operations is navigating the appropriate permitting process. When zoning codes do not contain compost-specific terminology and composting operations are classified as land use involving solid waste management activities, CUPs and CEQA documentation are required. The involvement of CEQA considerably extends the permitting process while the interpretation of land use requirements is at the discretion of local planning departments,and approval or denial of a project typically rests with the local elected officials such as the zoning commissioner. Securing support from multiple stakeholders, including community members, community-based organizations, and city officials, can help with the success of securing local permitting for a composting project.

II. CalRecycle Solid Waste Authorizations

California's Department of Resources Recycling and Recovery (CalRecycle) is the governmental entity that regulates state recycling and solid waste management programs and facilities and the administrator for the Short-Lived Climate Pollutants Reduction Act (SB 1383). As of 2022, SB 1383 mandates that every jurisdiction in California must divert 75% of 2014 levels of organic materials from landfills by 2030 with the intention that recovered materials be used as a resource to build healthy soils or reduce methane emissions causing global warming. SB 1383 requires cities and counties to annually procure the products that result from organics recovery operations, whether renewable natural gas or compost. These procurement requirements aim to increase demand for bioresources, drive infrastructure investments, and create employment opportunities within the state. This change provides a significant opportunity for local jurisdictions to support community composters directly.

Table 2: CalRecycle Permitting Structure

Feedstock	Excluded Activity	EA Notification Tier	Registration Permit	Compostable Materials Handling Permit	Full Solid Waste Facility Permit
Mixed (includes food material)	100 cy limit 750 sqft size limit	5,000 cy limit 2-year expiration Research only	-	-	> 100 cy materials > 750 sqft size
Agricultural	No limit Remains on-site 1,000 cy compost giveaway limit	No limit No compost giveaway limit	-	-	-
Agricultural & Green	-	No agricultural limit 12,500 cy green limit	-	-	> 12,500 cy green materials
Chip & Grind	-	< 200 tons per day	> 200 and < 500 tons per day	> 500 tons per day	-
Vegetative Food	-	-	< 12,500 cy materials limit	> 12,500 cy materials limit	-

Note: cy limit refers to the maximum cubic yards of feedstock materials, final compost, and any additional processing materials that are allowed on-site at any given time as per CalRecycle regulations.

CalRecycle Compost Permitting

Unless explicitly defined as an "excluded activity," all composting activities must receive authorization from CalRecycle before a site begins operations (source). There are four potential avenues for authorization:

- an Enforcement Agency (EA) Notification
- a rarely used Registration Permit
- a Compostable Materials Handling Permit
- a Full Solid Waste Facility Permit (the same permit given out to traditional landfills).

The authorization required is predominantly determined by feedstock material type and total cubic yards of composting material on-site at any given time. Table 2 shows a high-level overview of the authorization system, and a detailed overview of each tier is provided in the following sections.

Excluded Activities

Some composting activities are excluded from regulation, these activities include:

1. Vermicomposting (not including the handling of materials prior to and after processing)
2. Mushroom farming (not including the handling of materials prior to and after processing)
3. Certain agricultural operations processing only materials generated on-site
4. Small-scale composting operations less than 100 cubic yards

Agriculture Exclusion: For an agricultural composting operation to qualify as an excluded activity, the composter must make their compost on-site, only using materials generated on-site. This compost can then only be applied back onto the soil of that same agricultural site[1]. In this scenario, there is no limit to how many cubic yards of agricultural materials can be composted on-site. However, these operations are not allowed to give away or sell more than 1,000 cubic yards of compost annually, severely limiting the product's economic value to the producer. This exclusion is highly limiting to most large farms in the California Central Valley, which predominantly produce only a single crop on their site: To make proper compost, you need at least one carbon-dominant material (such as woody biomass from orchard trimmings) and one nitrogen-dominant material (such as manure). This exclusion does not allow two agricultural producers to combine their feedstock, even if the sites or farms are directly adjoining.

Small Scale Exclusion: Small composting operations are excluded so long as they do not exceed the de minimis amount of 100 cubic yards and 750 square feet, and only if they process green material, agricultural material, vegetative food material[2], food material[3], or a combination thereof. This exclusion is significant because it is the best way for a small composter that accepts traditional food waste to avoid being permitted as a Full Solid Waste Facility. Other authorizations that allow for certain amounts of "vegetative food material" exist but are not commonly used.

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1 It may also be applied to an agricultural site owned or leased by the owner, parent, or subsidiary of the composting activity.
2 Vegetative food material is defined as plant material with no additives such as salt, fats and oils, preservatives, or adulterants. It is separated out from other food material and the municipal solid waste stream.
3 Food material is defined as waste material of plant or animal origin that results from the preparation or processing of food for animal or human consumption. It is separated from the municipal solid waste stream.

EA Notification Tiers

Activities falling in the EA notification tier do not require a full permitting process with CalRecycle. Instead, the compost operator must inform their local enforcement agency (LEA) of their proposed operation through a written statement. Under this authorization, the LEA has the discretion to establish specific operating standards for the composting facility, which are usually based on the local jurisdiction's municipal codes for handling any "solid waste" materials.

Table 3: CalRecycle's Authorization Structure for Agricultural Composting

CalRecycle's Authorization Tier for Agricultural Composting Operations					
Feedstock	*Authorization Tier*	*Materials On-Site Limit*	*Annual Giveaway Limit*	*Off-site feedstock materials allowed?*	*Finished compost must remain on-site?*
Agricultural Only	Excluded Activity	No limit	1,000 cy	No	Yes
	EA Notification	No limit	No limit	LEA Discretion	No
Agricultural & Green	EA Notification (on Zoned Ag Land)	Ag: No limit Green: LEA discretion on 12,500 cy limit	1,000 cy	LEA Discretion	LEA Discretion
	EA Notification (not on Zoned Ag Land)	Ag: No limit Green: 12,500 cy limit	1,000 cy	LEA Discretion	LEA Discretion

Agricultural Sites: Agricultural composting operations that do not qualify for exclusion may need to file an EA notification. Table 3 summarizes the regulation regarding agricultural composting operations by feedstock material type, limited to agricultural only or agricultural and green. Composters that only process agricultural materials, there is no limit on how much agricultural material can be handled or the amount of final compost sold or given away. Composters that process both agricultural and green materials and either: a) are on land that is not zoned for agricultural use or b) sell or giveaway more than 1,000 cubic yards of compost annually have a defined green materials limit of 12,000 cubic yards. Composters who are on land zoned agricultural use and give away less than 1,000 cubic yards of compost annually will have to abide by potential green material feedstock limits set forth by the LEA.

Green Material Sites: A green material composting operation may have no more than 12,500 cubic yards of materials on-site at any time. To allow for seasonal variations in the rate at which compost is used by consumers (particularly agricultural producers), the operator may request in writing that the final compost product be temporarily excluded from the calculation of the 12,500 cubic yard maximum. This is known as the "seasonal storage adjustment." The EA may decide whether this adjustment be granted on the basis that the additional amount of compost on-site does not pose a risk to environmental or public health. The EA may determine that the amount of compost stored may be extended to the storage time and storage volume specified in the land use entitlement for the site.

Research Sites: With a two-year operation agreement, research composting operations may process any kind of organic waste for research purposes so long as there is no more than 5,000 cubic yards of material on-site at any one time. The operation agreement can be renewed if the LEA continues to approve the research. If the composter wishes to continue despite no longer falling under the EA notification standards, they must seek the appropriate authorization, such as filing for the proper CalRecycle permit.

Registration Permit and Compostable Materials Handling Facility Permit

Chip and Grind Sites: Chip and grind operations may require one of three potential authorizations: an EA notification, a Registration Permit, or the full Compostable Materials Handling Facility Permit. The level of authorizations will depend on how many tons of green material are received per day.

Vegetative Food Material Sites: Similarly, composting operations that process vegetative food materials may either be subject to a Registration Permit or a Compostable Materials Handling Facility Permit, depending on the amount of materials on-site (see Table 2). However, the permits for vegetative food material are rarely used due to the limited flexibility surrounding the definition of what constitutes as "vegetative food material," which does not accept post-consumer food material. Because these permits require similar land use authorizations, composters often apply for a Full Soil Waste Permit for more flexible operating standards.

CHIP & GRIND

A chipping and grinding facility in California is a facility that mechanically reduces the size of compostable materials, but does not produce compost. It is considered a compostable materials handling facility or operation.

Chipping and grinding facilities must meet the requirements of California Code of Regulations (CCR) Title 14, Division 7, Chapter 5.0, Article 3.0. Some of the requirements include:

Handling of materials: The facility can only handle materials that are allowed at a green material composting operation or facility, excluding manure.

Food waste: The facility cannot take food waste, unless the Local Enforcement Agency allows it.

Green waste: The facility must chip or grind and utilize green waste on-site or remove it within 48 hours.

Full Solid Waste Facility Permit

Any composting operations that fall outside the requirements laid out above must apply for a Full Solid Waste Facility Permit. This permit regulates traditional landfills and large commercial composting facilities. It is also necessary for composting operations that manage more than 12,500 cubic yards of materials or process feedstock that includes food materials, digestate, biosolids, and mixed materials. These feedstock materials are commonly seen as a higher risk to environmental health and public safety and therefore regulated more heavily. Composters that want to manage more than 100 cubic yards of total composting materials and hope to process food materials from off-site will either need to apply for a Full Solid Waste Permit or limit their operations to qualify as an excluded activity. A clear midsize path for facility permit approval does not currently exist.

Challenges with CalRecycle Permitting

For All Composting: The current permit structure established by CalRecycle is complex and presents several challenges for composting operations. It includes various excluded activities, the involvement and discretion of Enforcement Agencies (EAs), multiple permit types, and rigid definitions and operating standards. Navigating this tiered system requires careful planning and direct consultation with the LEA.

The system is primarily based on arbitrary limits regarding operational processing capacity and is heavily influenced by the type of feedstock being processed. This haphazard policy framework discourages growth and diversification in the utilization and recycling of these valuable resources. Challenges presented by a lack of comprehensive policy surrounding organic material resources management make it difficult for regular composting operations to expand and adapt to changing needs. Furthermore, these restrictions lead to conditions that prioritize large municipal composting facilities with the financial resources to navigate the complex regulatory matrix, namely franchise haulers who can obtain the capital necessary to finance 3-8-year permitting processes based on their existing hauling businesses and exclusive franchise agreements.

For Community Composting:

CalRecycle's Compostable Materials Handling Permit does not adequately address the needs of community composting operations. Community-driven organic waste often contains a mix of different feedstocks, including vegetative food materials, food materials, and green materials. This makes them ineligible for an EA notification, Registration Permit, and Compostable Materials Handling Permit, which are all required if they want to receive funding and credit for compost procurement. The current de minimis exclusion, while allowing these operations to establish footholds at the non-profit level, effectively limits the growth of compost processing capacity at the community level.

State Water Boards

The State Water Resources Control Board and the nine Regional Water Quality Control Boards (Water Boards) are required to protect the state's waters by setting water quality standards and wastewater compliance requirements. Rather than processing individual composting permits, the State Water Board adopted The General Order for Waste Discharge Requirements for Composting Operations (General Order). The General Order allows for Regional Water Boards to permit composting operations to ensure water quality is maintained. (source)

Water Board's Composting General Order Permitting

The General Order allows the Water Boards to permit composting operations and address potential impacts on water quality based on feedstock material, operation size, and site conditions as they relate to groundwater and proximity to surface water. The order also provides some exemptions based on size, feedstock, and application rates. Table 4 summarizes the Water Board's permitting structure.

Table 4: State Water Board's Composting General Order Permitting Structure

<table>
<tr><th>Excluded Activities</th><th colspan="2">Tier 1</th><th>Tier 2</th></tr>
<tr><td>< 500 cy of any material
>5,000 cy with some mitigation</td><td colspan="2">< 25,000 cy</td><td>> 25,000 cy</td></tr>
<tr><td>Agricultural Operations if:
• > 25,000 cy
• Feedstocks are agricultural, green, manure materials (no animal carcasses)
• Compost is returned to the same site and applied at an agronomic rate
• 5,000 cy giveaway limit</td><td colspan="2">• Vegetative agricultural and food materials
• Green and paper materials
• Residential food and green materials
• Manure
• Anaerobic digestate derived from Tier 1 feedstock</td><td>• Non-vegetative food materials
• Biosolids
• Anaerobic digestate derived from Tier 2 feedstocks</td></tr>
<tr><td rowspan="5">No percolation rate requirements</td><td colspan="2">Percolation rate within:</td><td rowspan="5">Percolation rate outside requirements</td></tr>
<tr><td>Soil Percolation Rate (min/in)</td><td>Minimum Depth to Groundwater</td></tr>
<tr><td>< 1</td><td>50 ft</td></tr>
<tr><td>1 - 5</td><td>20 ft</td></tr>
<tr><td>5 - 30</td><td>8 ft</td></tr>
<tr><td></td><td>> 30</td><td>5 ft</td></tr>
</table>

Exempt Activities

The Water Board General Order provides exemptions for certain composting activities that are deemed unlikely to degrade water quality, including the following:

1. Composting operations that receive, process, and store less than 500 cubic yards
2. Chipping and grinding operations
3. Composting operations that receive, process, and store less than 5,000 cubic yards if they:
    - cover materials during storms
    - minimize wastewater generation
4. Lot clearing by local government agencies for fire protection

The General Order also provides a conditional exemption to certain agricultural and on-farm operations so long as they meet these criteria:

1. less than 25,000 cubic yards of feedstock and compost at any time;
2. feedstocks are limited to agricultural, green, and manure materials, excluding animal carcasses;
3. the compost is returned to the same site or a property owned by the composting operator, applied at agronomic rates; and
4. no more than 5,000 cubic yards of compost is distributed annually.

Conditionally exempt activities must implement best management practices to prevent issues like ponding, erosion, and infiltration. However, some exemptions may still be subject to individual water discharge requirements based on site-specific conditions.

Tier 1 & 2 Operations

The General Order categorizes all other composting operations into two tiers based on potential water quality threats.

Tier 1: Operations handle less than 25,000 cubic yards of compost materials and can process feedstock deemed less harmful to water quality (see Table 2). They must also comply with specific soil percolation rates to prevent groundwater infiltration.

Tier 2: Operations include those managing 25,000 cubic yards or more, not meeting percolation standards, or processing feedstock that poses a greater risk to water quality, such as post-consumer food material and animal products.

Design, Construction, and Operation Requirements

The Water Boards provide minimum design standards for operations under both tiers that limit infiltration, runoff, and flooding to prevent water quality degradation. These standards require that all working surfaces must be constructed to

1. facilitate drainage and minimize ponding to avoid infiltration
2. transfer liquids into a containment structure to minimize wastewater drainage
3. prevent conditions that could cause contamination, pollution, or nuisance.

Some required construction projects include berms and drainage systems.

For Tier 2 operations, the Regional Water Board may require additional operating standards to maintain water quality. All working surfaces must be constructed to prevent specific infiltration specs. Drainage ponds are also required and must be constructed to certain permeability standards with a monitoring device at the lowest point in the pond. These design requirements are highly engineered, capital-intensive, and require regular maintenance and reporting(source).

Challenges with Water Board Permitting

Three main challenges arise with Water Board permitting: high costs, lengthy processing times, and inconsistencies between regulatory agencies.

First, composters need significant investments for constructing, permitting, and operating a compliant composting site. Tier 1 facilities struggle to remain cost-effective due to limits on the volume of composting material allowed on-site. Tier 2 operations face increased compliance costs, including requirements for concrete pads, water monitoring equipment, and detention ponds, especially when processing “non-vegetative food materials” like post-consumer food waste.

Second, obtaining approvals from the Water Boards can take years, creating a significant barrier for establishing a new composting operation. When permitting processes get prolonged, it can often mean additional costs for additional staff time or it can disrupt parallel permitting processes. CalRecycle advises submitting applications at least 12 months before starting operations due to the lengthy review process.

Finally, the Water Board’s permitting structure is inconsistent with other regulations, including those from CalRecycle. A December 2023 report highlighted these inconsistencies, noting that the State Water Board and CalRecycle developed an online tool to help users navigate permitting requirements. However, this tool has not yet been published, and it does not resolve the fundamental differences in volumes between the two agencies’ tiered permitting systems. For example, CalRecycle sets the volume limit for excluded activities at 100 cubic yards, while the Water Boards set it at 500 cubic yards. These differences are also seen with the Tier 1 threshold, which does not correlate with any of the CalRecycle tier thresholds.

Air Pollution Control Districts

Under the Federal Clean Air Act, local air pollution districts are required to produce and implement plans for preventing and mitigating any pollutant that exceeds federal levels. Air districts have control over "stationary sources" of air pollution, which includes industrial sources such as organics recycling operations. Active composting piles may release volatile organic compounds (VOCs) depending on feedstocks and how they are managed. Therefore, new compost operations must undergo a permitting process with their local air district, despite the fact that methane, a commonly-known VOC, is the primary short-term climate pollutant SB 1383 aims to reduce through organic waste recycling(source).

Understanding VOCs and Compost

The Federal Clean Air Act broadly categorizes volatile organic compounds (VOCs) while only accounting for new point sources. This framing does not accurately reflect the real air quality impacts of composting for three main reasons:

1. it does not differentiate between ozone precursor VOCs – the compounds that are responsible for negative health impacts – and non-ozone precursor VOCs
2. it focuses solely on point-source VOC emissions rather than air basin-wide emissions
3. it does not regulate naturally occurring VOC sources.

These limitations oversimplify the effects of composting on air quality and overlook potential regional air quality benefits that could result from increased composting.

While composting does emit some VOCs, such as ammonia and alcohol aerosols (Source?), most have a low potential for ozone formation; only about 10% of VOCs from composting green waste are classified as medium to high ozone precursors (source). Additionally, the Clean Air Act does not regulate naturally occurring emissions such as decay, meaning it doesn't account for all the organic waste that is not processed in regulated waste management operations; air districts do not track the VOCs from organic waste materials that are burned or stored in static piles and waste lagoons, even though they are more harmful than the VOCs from composting. Composting these materials would reduce the overall VOCs in the region. However, air districts do not consider those "savings" when analyzing the impacts of a new composting operation due to the Clean Air Act's focus on point-source emissions only (source).

This oversimplification creates obstacles for establishing new composting facilities, especially in "nonattainment" regions where air quality does not meet national standards and additional point-source emissions face strict regulation. In these regions, there are often specific management requirements that can lead to increased costs for a composter to operate.

Challenges with Air District Permitting

There are 35 local air pollution control districts in the State of California, and there is no standardized approach to regulating composting operations through the air districts. Each air district has different air quality standards and compliance measures to regulate composting operation emissions.

Generally, unless a composting operation qualifies for a permit exemption, an air district will first determine the composting activity's Potential to Emit, or the estimated emissions. Air districts then use these results to determine if the proposed activity exceeds the air district's threshold in pounds of VOCs per day and requires one of three compliance measures: a Health Risk Assessment (HRA), a Best Available Control Technology (BACT), or Emission Reduction Credits (ERCs). The thresholds for an HRA, BACT, and ERC vary by air district, as do thresholds or conditions that qualify for exemption. Most air districts provide no exemptions for composting activities, which can lead to prohibitive BACT requirements that result in projects not being financially viable. If a composter does attempt to get an exemption, they are often required to measure their emissions and provide data to air districts that verify their emissions are below their emission thresholds, an expensive process (source: CACC). Additionally, there are limited ERCs available for new facilities and existing operations, which restricts projects to sizes that remain below the ERC threshold. For a compost operator to ensure they comply with air district regulations, they must consult with their specific regional air district.

The South Coast Air Quality Management District (SCAQMD), which covers most of Orange County, Los Angeles County, Riverside County, and San Bernardino County, and the San Joaquin Valley Unified Air Pollution Control District (SJVAPCD), which governs the agricultural center of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and some of Kern counties, have compost-specific regulations that affect small and medium composting operations. SCAQMD requires all chip-and-grind and composting operations to be registered within the air district, with some exceptions including community composters, backyard composters, and agricultural composters. SCAQMD also requires additional emission reduction practices for operations that compost green waste, food material, manure, and biosolids. These rules depend on the feedstock and volume of the compost operation and include requirements on covering initial compost piles, wetting compost piles, implementing "emission control devices" (which require an additional permit to acquire), and record keeping. SJVAPCD has similar rules and requirements for management practices that vary depending on feedstock and volume.

Discussion of Findings & Key Takeaways

The existing structure of state, regional, and local permitting pathways disincentivizes the development of small and medium composting operations, particularly those that process food and off-site materials. Ideally, state, regional, and local regulations should all cohesively incentivize small and medium composting operations to divert as much organic material as possible as close to its generation source and in ways that prioritize balanced recipes for composting, resulting in high-quality compost suitable for local land application and nutrient cycling. The regulations instead create barriers to entry for new composting sites, which is a clear misalignment with the State's goal to empower and support organic material diversion and utilizing natural and working lands to sequester carbon.

Obstacles that create a barrier to entry for new composting operations include:

1. Navigating the permitting process is a lengthy, costly endeavor that could take years before full approval and compliance.
2. Regulatory rules are often based on feedstock material volume and type, limiting composters' ability to combine diverse feedstock material, particularly community and on-farm composters who wish to bring in off-site materials.
3. The limitations on volume of materials allowed on-site stifles economic growth.
4. Water Board and Air Pollution Control Board compliance measures are fiscally prohibitive and based on potentially exaggerated risk of adverse environmental impacts.

There are opportunities for regulatory agencies, especially at the local and regional scale, to adjust their regulations and permitting processes to accommodate the increased need and demand for composting.

Shift Compost Regulations from Waste Management to Bioresource Development

The regulatory challenges that inhibit the growth of diversified composting stem from a lack of differentiation between composting and other kinds of waste management processing. Local, regional, state, and federal agencies all regulate composting as a waste management activity with potential risks to water and air quality rather than as the development of a bioresource. Fear surrounding the nuisance and point-source impacts of composting operations often drive regulatory agencies to not consider the systemic benefits of compost creation and application. Regulations often over emphasize the potential negative environmental effects of composting operations and obscure regional benefits on ecological systems. Air District regulations, in particular, bring this paradox to light, limiting the establishment of composting operations in regions that could benefit from improved air quality that compost creation and application could provide.

Regulating organic material as a resource could reframe compost management to prioritize combining diverse feedstock, gathering feedstock from off-site, and other practices that drive streamlined, accessible start up processes and potential for economic growth. This reframe would promote a more streamlined approach to permitting composting operations that encourages diversity in composting operation type and scale. Address Inconsistencies between Agencies

The lack of consistency among permitting structures creates a significant barrier to entry for aspiring composters, particularly for small- to medium-sized composters not connected to larger hauling operations or which lack the ability to access upfront capital. Navigating the different matrices of permitting requirements may require technical assistance, as requirements differ based on feedstock type, operation size, and location.

The same operation may be permitted differently based on the jurisdiction in which a composter is trying to establish due to regional air district requirements or local zoning rules. This inconsistency indicates an opportunity for a more streamlined approach to permitting composting operations in a way that encourages diversity in composting operation type and scale.