



IMPLEMENTATION OF GENERAL WASTE DISCHARGE REQUIREMENTS FOR COMPOSTING OPERATIONS (ORDER WQ 2015-0121-DWQ)

REPORT TO THE STATE WATER RESOURCES CONTROL BOARD

October 2018



TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	1
2. INTRODUCTION	2
3. PERFORMANCE MEASURES	3
4. COMPOSTING OPERATIONS	10
4.1 COMPOSTING STATEWIDE.....	10
4.1.1. Permitting.....	10
4.1.2. Volume Composted.....	11
4.2 COMPOSTING FACILITIES ENROLLED UNDER WQ 2015-0121-DWQ.....	12
4.2.1. Feedstocks.....	12
4.2.2. Compliance Approaches.....	14
4.2.3. Compliance Issues and Costs.....	18
4.2.4. Composting Methods.....	20
5. ORGANIC MATERIALS MANAGEMENT	21
5.1 GENERAL OVERVIEW.....	21
5.2 CHIP AND GRIND FACILITIES.....	21
5.3 LAND APPLICATION OF UNCOMPOSTED ORGANIC MATERIALS.....	22
5.4 MANURE MANAGEMENT.....	24
5.5 CALIFORNIA HEALTHY SOILS INITIATIVE.....	25
6. SUMMARY	27

TABLES AND FIGURES

Figure 1. Permitting Process Time Comparison.....	9
Figure 2. Estimated Annual Compost Throughput by Regulatory Mechanism.....	12
Figure 3. Feedstocks Used by Tier I and Tier II Facilities.....	13
Figure 4. Volume and Feedstocks Composted at Manure-Composting Facilities.....	14
Figure 5. Scheduled Year for the Completion of Compliance Modifications at Enrolled Facilities.....	15
Figure 6. Proposed Compliance Modifications at Tier I and Tier II Facilities.....	16
Figure 7. Number of Existing Tier II Facilities Proposing Compliance Modifications.....	16
Figure 8. Proposed Working Surface Improvements at Existing Tier II Facilities.....	17
Figure 9. Proposed Wastewater Pond Improvements at Existing Tier II Facilities.....	17
Figure 10. Estimated Cost per Acre for Tier II Modifications.....	19
Figure 11. Estimated Cost per Cubic Yard of Annual Compost Throughput for Tier II Modifications.....	19
Figure 12. Composting Methods at Enrolled Facilities.....	20
Table 1. Summary of Goals, Strategies and Performance Measures.....	5-7
Table 2. Performance Measure Deliverables.....	8
Table 3. Waste Discharge Requirement Types for Composting Operations Statewide.....	10
Table 4. Summary of Land Application Enforcement Cases.....	24

APPENDICES

Appendix A – Glossary of Terms.....	28
Appendix B – List of Acronyms and Abbreviations.....	30
Appendix C – Summary of Groundwater Monitoring Results.....	31

1. EXECUTIVE SUMMARY

On August 4, 2015, the State Water Resources Control Board (State Water Board) adopted General Waste Discharge Requirements for Composting Operations, Order WQ 2015-0121-DWQ (Composting General Order). The State Water Board directed staff to work with stakeholders to develop performance measures and report on implementation of the Order. On September 19, 2017, Water Board staff presented a report to the Board that included information about performance measures, enrollment, and compliance with the Composting General Order. Stakeholders expressed concerns regarding limitations of the on-farm composting exemption and requirements for composting herbivore manure. The State Water Board requested staff to evaluate the requirements and report back in March 2018. At the March 20, 2018 board meeting, staff presented stakeholder concerns and concepts for potential conceptual revisions to the Composting General Order. The State Water Board directed staff to revisit the requirements and revise the Composting General Order accordingly.

The Composting General Order was developed to efficiently support the diversion of organic material from landfills to composting operations while providing requirements to protect water quality. The Order applies to facilities that aerobically compost materials such as green waste, manure, anaerobic digestate, biosolids, food scraps, and paper products. Not all composting activities need to enroll in the Composting General Order. Some composting operations are issued individual Waste Discharge Requirements (WDRs) due to site-specific conditions and operations. Composting activities that occur as part of materials or nutrient management at agricultural operations with agriculture-specific WDRs and/or are implementing requirements through other orders may be exempt from the Composting General Order. Small commercial composting operations may be either exempt or conditionally exempt from the Composting General Order.

There are 116 compost facilities enrolled or are in process of enrolling under the Composting General Order, operating pursuant to individual WDRs or conditional waivers of WDRs, or are identified as exempt.

Water Board staff coordinated three public meetings for stakeholders in 2016 to provide input on the development of goals and performance measures. The goals developed in collaboration with stakeholders are:

1. Assess water quality protection;
2. Provide effective and transparent communication of permit requirements and compliance information between regulators and stakeholders;
3. Support diversion of organic materials to composting and anaerobic digestion facilities and engage in the Healthy Soils Initiative; and
4. Assess implementation costs.

Water Board staff continue to monitor the effectiveness of the Composting General Order through performance measures that include data collection and reporting. In addition, staff continue to conduct outreach and regularly participate in interagency work groups on organics management, the Healthy Soils Initiative, and engage in collaborative activities with other agencies and groups to promote sustainable organics management and remain receptive to industry stakeholders and emerging concerns.

2. INTRODUCTION

The State Water Board adopted the Composting General Order on August 4, 2015. Resolution No. 2015-0054 (Resolution) certified the Environmental Impact Report, State Clearinghouse No. 2015012021 (EIR). The Resolution directed staff to report to the State Water Board on the development and progress of performance measures and the status of enrollment and compliance with the Composting General Order. This is the second annual report presenting an update on performance measures, compliance with the Composting General Order, and education and outreach activities conducted for organic materials management.

Compost contains beneficial micro-organisms and can be useful as a humus-rich soil amendment. Applying compost to land can help retain soil moisture, reduce irrigation needs and lower runoff potential. The use of compost is one of a combination of sustainability practices promoted by California's Healthy Soils Initiative to ensure agricultural soils have adequate organic matter and carbon content to be sustainable.

To create compost, organic substances are biologically decomposed in a controlled manner to produce a stabilized product. The process of generating compost can produce a leachate. Without adequate controls, leachate can pose a threat to water quality. The Composting General Order was adopted to provide measures to protect water quality while streamlining the permitting process to support diversion of organic materials away from landfills to composting operations. Depending on the types of feedstocks used, volume of materials on site, and hydrogeologic site conditions, facilities enrolled under the Composting General Order may need to comply with either Tier I or Tier II requirements. The requirements of the Composting General Order are not intended to be universally applied to all composting activities but to apply to most commercial composting operations. Some activities are exempt from these requirements; owners of facilities with exempt activities may file a Notice of Non-Applicability (NONA) with the applicable Regional Water Quality Control Board (Regional Water Board) detailing the reasons for exemption from the Composting General Order. Composting facilities in operation at the time the Order was adopted and without applicable WDRs were required to apply for coverage under the Composting General Order by August 4, 2016. Composting facilities operating pursuant to conditional waivers, individual WDRs, or other general orders applicable to composting operations may be able to continue operations in accordance with those orders. For example, a composting facility may be co-located at a facility operating pursuant to individual or general WDRs which include requirements for the composting operation. New or proposed eligible composting operations are required to seek coverage under the Composting General Order at least 90 days prior to commencement of the composting operation.

This report includes a discussion of performance measures associated with the Composting General Order, a description of composting operations enrolled under the Composting General Order, the permitting of composting operations statewide, and organic materials management.

3. PERFORMANCE MEASURES

Developing performance measures and providing subsequent reports is imperative in communicating to the public the effectiveness of the Water Boards in protecting California's waters. Establishing and using performance measures to track and report progress in meeting goals and targets helps to better manage and evaluate our programs, activities, priorities, and efficiency. Development of performance measures is intended to promote the improvement in communication and transparency between state regulators and the regulated community, to demonstrate the State Water Board's support for diversion of organic materials to composting and anaerobic digestion facilities, and to assess compliance with the Composting General Order.

State Water Board staff met with stakeholders in 2016 to collaborate on the development of performance measures for the implementation of the Composting General Order. Table 1, Goals, Strategies, and Performance Measures, summarizes ideas that were proposed at the 2016 stakeholder meetings. Table 2, Performance Measure Deliverables, shows the deliverables and their status. Below is a discussion of the actions taken by State Water Board staff in support of these goals.

Goal 1: Assess Water Quality Protection

The Composting General Order was developed to provide composting facilities with parameters to protect water quality. This report presents regulatory compliance information from facilities enrolled in the Composting General Order, previous regulatory status, tier information, and the volume of organic material that is processed at composting operations. State Water Board staff will evaluate water quality monitoring data from enrolled facilities and report potential incidences of groundwater impacts. Evaluating facility and monitoring information will aid in assessing the adequacy of Composting General Order requirements. So far, only two Tier II facilities have installed groundwater monitoring wells. One Tier II facility installed groundwater monitoring wells earlier this year in lieu of working surface hydraulic conductivity improvements; however, sampling results are not available yet. When groundwater monitoring data is available, this information will be added to the annual report. A different Tier II facility monitors groundwater quality in addition to meeting working surface hydraulic conductivity requirements, and submits reports through the State Water Board's GeoTracker database. The data do not appear to indicate a release of waste constituents to groundwater from this facility. A summary of groundwater monitoring results is included in Appendix C.

Goal 2: Effective and Transparent Communication of Permit Requirements and Compliance Information between Regulators and Stakeholders

Stakeholders expressed concern that requirements of the Composting General Order may be inconsistent with other applicable regulations. To foster consistency and transparency, State Water Board staff meet frequently with state and local agencies to discuss composting-related regulations and associated interagency issues. State Water Board staff meet with smaller stakeholder groups, engage in continuous communication with Regional Water Board staff and individual stakeholders about Composting General Order implementation and applicability, and engage in a variety of organics management conferences and training courses. In addition, a series of frequently asked questions and responses and a list of fully enrolled facilities are

provided online (www.waterboards.ca.gov/water_issues/programs/compost/). State Water Board staff are developing, in collaboration with CalRecycle staff, an online, interactive tool for the composting community. This tool guides the user through a series of questions to give the user an idea of what permits may be needed for a composting operation from both CalRecycle and the Water Board. The objectives of the tool are to 1) assist composters to navigate through the requirements of both agencies, 2) help streamline the permitting process, and 3) increase transparency and consistency in agency staff's application of requirements. This tool is anticipated to be available early 2019.

Goal 3: Support Diversion of Organic Materials to Composting and Anaerobic Digestion Facilities and Engage in the Healthy Soils Initiative

Stakeholders expressed concern that compliance with Composting General Order requirements may result in green waste materials currently received at composting facilities to be redirected to landfills or directly applied to land with no composting or pathogen reduction. State Water Board staff continue to collaborate with CalRecycle and the Local Enforcement Agency (LEA) staff, conduct education and outreach regarding proper land application practices and applicable regulations, encourage the responsible management of organic material through composting and anaerobic digestion, and communicate enforcement on illegal dumping. A discussion on land application and organics management is included in this report in Section 5, Organic Materials Management.

Stakeholders were also concerned that the flow of organic materials was unknown and that the Composting General Order would not prove to be an efficient regulatory mechanism to meet the expected increase in organic materials to be diverted from landfills. More discussion on the volumes and materials composted is included in Section 4, Composting Operations.

CalRecycle is developing requirements through Assembly Bill No. 901 implementation (AB 901; Gordon. Solid waste: reporting requirements: enforcement. 2015–2016 Reg. Sess., Stats. 2015, ch. 746) to track the flow of organic materials and better understand organic materials lifecycles. These efforts are ongoing and State Water Board staff are coordinating with CalRecycle staff on the implementation of AB 901 and Senate Bill No. 1383 (SB 1383; Lara. Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills. 2015–2016 Reg. Sess., Stats. 2016, ch. 395) which supports California's statewide diversion and recycling goals. The Composting General Order was developed to support organics diversion efforts by streamlining the permitting process for composting facilities. To assess the success in meeting this objective, Water Board staff compared the amount of time it takes to issue notices of applicability (NOAs) for enrollment under the Composting General Order relative to the amount of time it generally takes to issue individual WDRs for composting facilities. As shown in Figure 1, Permitting Process Time Comparison, a conservative estimate for a Regional Water Board to adopt an individual WDR is approximately 230 calendar days. Often, the process may take a year or more. The issuance of individual WDRs must be a public process and adopted by the Regional Water Boards, while enrollment under the Composting General Order requires approval by the Regional Water Board's Executive Officer with few statutory time constraints. The process for issuance of an NOA for enrollment under the Composting General Order has taken an average of 169 calendar days, demonstrating the enrollment process for the Composting General Order being significantly more time-efficient compared to the individual WDR issuance process.

Table 1. Goals, Strategies, and Performance Measures

Division of Water Quality - 2016-2019 Composting General Order Implementation Performance Plan			
Vision			
<i>Protect water quality consistent with provisions of the California Water Code, division 7, and related state water quality control plans and policies to ensure protection of beneficial uses of the state's waters from composting operations.</i>			
Mission			
<i>Provide consistent statewide regulatory requirements for composting operations, streamline the permitting process for composting operations that meet certain conditions, and support California's diversion goal to recycle, compost or source reduce 75 percent of solid waste being disposed of in landfills by 2020 by diversifying the types of feedstocks allowed under the Composting General Order.</i>			
Goals	Strategies (Action Plans)	Objectives/Outcomes (Targets)	Performance Measures/Indicators
1. Assess Water Quality Protection	1.1) (a) Gather regulatory compliance information from the enrolled facilities as well as their previous regulatory status, and evaluate the diversion of organic materials to composting by tracking the volume of material that is processed at composting operations.	1.1) Evaluate and report to the State Water Board the effectiveness of the Composting General Order in protecting water quality.	1. Beginning in August 2017, report the number of enrolled facilities and their compliance approaches.
	1.1) (b) Track incidences of groundwater impacts from composting operations.		2. By August 2017, report the number of enrolled facilities that were previously unregulated.
	1.1) (c) Track water quality monitoring data from composting operations.		3. Beginning in August 2017, report to the State Water Board the statewide volume of organic materials processed at composting operations.
			4. Provide an annual report to the State Water Board every autumn beginning in 2017.
			5. Report incidences of groundwater impacts in the annual update of the report to the State Water Board every autumn beginning in 2018.
			6. Beginning in autumn 2018, report on water quality monitoring data gathered from enrolled operations in the annual update of the report to the State Water Board.
2. Effective and Transparent Communication of Permit Requirements and Compliance Information between Regulators and Stakeholders	2.1) (a) State Water Board staff continue to train regulators and stakeholders on the implementation of the Composting General Order.	2.1) Improve permit training and collaboration with regulators and stakeholders.	1. Continue educating regulators and stakeholders on the implementation of the Composting General Order by posting frequently asked questions and fact sheets on the compost webpage by the end of 2016.
	2.2) (a) Conduct joint facility inspections where applicable and share inspection reports.	2.2) Coordinate, to the extent feasible, compliance and enforcement activities amongst responsible state and local agencies.	not applicable
	2.2) (b) Report enforcement actions by state and local agencies to the Office of Enforcement and appropriate agency staff; post completed enforcement actions on state and local agency websites.		not applicable
	2.3) Maintain a list of enrolled facilities as data becomes available.	2.3) Improve access communication of enrollment information.	2. Maintain an updated list of enrolled facilities on the State Water Board compost webpage to improve access and communication of enrollment information beginning in September 2016.

Table 1. Goals, Strategies, and Performance Measures

continued

Division of Water Quality - 2016-2019 Composting General Order Implementation Performance Plan			
Goals	Strategies (Action Plans)	Objectives/Outcomes (Targets)	Performance Measures/Indicators
3. Support Diversion of Organic Materials to Composting and Anaerobic Digestion Facilities and Engage in the Healthy Soils Initiative	3.1) (a) Provide education and outreach on proper land application (may include pamphlets, hyperlinks, and/or fact sheets posted to the compost webpage).	3.1) Evaluate current regulations, permitting processes, and enforcement authority with state and local agencies on land application of organic material and chip & grind facilities.	1. Beginning in August 2017, report to the State Water Board on education and outreach activities coordinated with CalRecycle; provide an annual update.
	3.1) (b) Track enforcement actions on chip & grind facilities and illegal land application of organic material.		2. Beginning in the autumn of 2018, report the number of enforcement actions in the annual update of the report to the State Water Board.
	3.2) Coordinate with CalRecycle on implementation of Assembly Bill No. 901 (AB 901; Gordon. Solid waste: reporting requirements: enforcement. 2015–2016 Reg. Sess., Stats. 2015, ch. 746).	3.2) Improve current reporting of movement of organic materials through CalRecycle's implementation of AB 901. AB 901 will require waste, recycling, and compost facilities, as well as exporters, brokers, and transporters of recyclables or compost to report to CalRecycle on the types, quantities, and flows of materials that are disposed of, sold, or transferred inside or outside of the state, with reporting anticipated to begin in 2019.	3. Starting with the 2018 annual report to the State Water Board, report actions taken in coordination with CalRecycle on AB 901 implementation. As reporting in accordance with AB 901 regulations will not commence until 2019, the 2020 annual report will be the first to include an update on the reporting information.
	3.3) (a) Track the number of facilities enrolled and information about each facility's compliance approach, plans, issues, and status.	3.3) Enroll composting operations* through streamlined process (via Composting General Order) * may include anaerobic digestion facilities	4. Beginning in August 2017, report to the State Water Board the facilities enrolled and compliance information; update annually.
	3.3) (b) Provide assistance to compost operators for utilization of the GeoTracker information system to upload required documents (e.g. technical reports, monitoring reports, etc.)		5. Provide GeoTracker deployment and training to compost operators for the utilization of the database to upload required documents. Phase-in to begin August 2017.
	3.3) (c) Compare the amount of time that it takes to complete the enrollment process for the Composting General Order versus issuance of individual WDRs.		6. Report by August 2017 a comparison of the amount of time it takes to issue notices of applicability for enrollment under the Composting General Order relative to the amount of time it generally takes to issue individual Waste Discharge Requirements for composting facilities.
	3.4) Inform CalEPA about State Water Board actions to ensure the responsible management of organic wastes. Responsible management of wastes will be communicated by means of education and outreach programs, deterrents/enforcement on illegal dumping, and the use of the Composting General Order.	3.4) Coordinate with other state and local agencies to support the beneficial use of compost (e.g. agricultural lands, rangelands, etc.).	7. Starting with the 2018 annual report to the State Water Board (and CalEPA), report enforcement actions or recommendations to ensure responsible management of organic material.

Table 1. Goals, Strategies, and Performance Measures

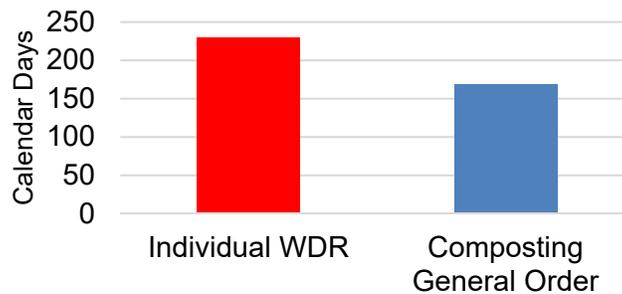
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Division of Water Quality - 2016-2019 Composting General Order Implementation Performance Plan			
Goals	Strategies (Action Plans)	Objectives/Outcomes (Targets)	Performance Measures/Indicators
4. Assess Implementation Costs	4.1) (a) Gather cost of compliance data from the organics management industry.	4.1) Assess the cost of compliance with the Composting General Order.	1. Starting with the 2018 report to the State Water Board, report known costs of compliance with the Composting General Order; update annually.
	4.1) (b) Evaluate and track if any facilities are closing or reducing/changing feedstock due to specific cost of compliance.		2. Beginning with the 2018 report to the State Water Board, report if any facilities are closing or reducing/changing feedstock due to specific cost of compliance with the Composting General Order; update annually.
	4.1) (c) Assist the industry by identifying potential sources of funding and evaluating the Water Board's authority to provide financial assistance.		3. Provide information for potential funding sources on the State Water Board's compost webpage by August 2017.
	4.2) Gather information on approved engineered alternatives and associated costs from organics management industry.	4.2) Evaluate approved engineered alternatives and costs.	4. Beginning with the 2018 report to the State Water Board, report known engineered alternatives and associated costs; update annually.

Table 2. Performance Measure Deliverables

Division of Water Quality - 2016-2019 Composting General Order Implementation Performance Plan		
No.	Performance Deliverables	Status
1.1	Beginning in August 2017, report the number of enrolled facilities and their compliance approaches.	completed and ongoing
1.2	By August 2017, report the number of enrolled facilities that were previously unregulated.	completed and ongoing
1.3	Beginning in August 2017, report to the State Water Board the statewide volume of organic materials processed at composting operations.	completed and ongoing
1.4	Provide an annual report to the State Water Board every autumn beginning in 2017.	ongoing
1.5	Report incidences of groundwater impacts in the annual update of the report to the State Water Board every autumn beginning in 2018.	ongoing
1.6	Beginning in autumn 2018, report on water quality monitoring data gathered from enrolled operations in the annual update of the report to the State Water Board.	ongoing
2.1	Continue educating regulators and stakeholders on the implementation of the Composting General Order by posting frequently asked questions and fact sheets on the compost webpage by the end of 2016.	(in process and ongoing)
2.2	Maintain an updated list of enrolled facilities on the State Water Board compost webpage to improve access and communication of enrollment information beginning in September 2016.	(in process and ongoing)
3.1	Beginning in August 2017, report to the State Water Board on education and outreach activities coordinated with CalRecycle; provide an annual update.	completed and ongoing
3.2	Beginning in the autumn of 2018, report the number of enforcement actions in the annual update of the report to the State Water Board.	(in process and ongoing)
3.3	Starting with the 2018 annual report to the State Water Board, report actions taken in coordination with CalRecycle on AB 901 implementation. As reporting in accordance with AB 901 regulations will not commence until 2019, the 2020 annual report will be the first to include an update on the reporting information.	(in process and ongoing)
3.4	Beginning in August 2017, report to the State Water Board the facilities enrolled and compliance information; update annually.	ongoing
3.5	Provide GeoTracker deployment and training to compost operators for the utilization of the database to upload required documents. Phase-in to begin August 2017.	completed and ongoing
3.6	Report by August 2017 a comparison of the amount of time it takes to issue notices of applicability for enrollment under the Composting General Order relative to the amount of time it generally takes to issue individual Waste Discharge Requirements for composting facilities.	completed
3.7	Starting with the 2018 annual report to the State Water Board (and CalEPA), report enforcement actions or recommendations to ensure responsible management of organic material.	(in process and ongoing)
4.1	Starting with the 2018 report to the State Water Board, report known costs of compliance with the Composting General Order; update annually.	(in process and ongoing)
4.2	Beginning with the 2018 report to the State Water Board, report if any facilities are closing or reducing/changing feedstock due to specific cost of compliance with the Composting General Order; update annually.	(in process and ongoing)
4.3	Provide information for potential funding sources on the State Water Board's compost webpage by August 2017.	completed
4.4	Beginning with the 2018 report to the State Water Board, report known engineered alternatives and associated costs; update annually.	(in process and ongoing)

Figure 1. Permitting Process Time Comparison



Staff are also engaged in the California Healthy Soils Initiative. Staff met with staff from the California Department of Food and Agriculture (CDFA), CalRecycle, California Environmental Protection Agency (CalEPA), California Air Resources Board (CARB), and the California Natural Resources Agency at more than 30 interagency meetings from the autumn of 2015 to the present as composting operations are critical in supporting both diversion goals and the Healthy Soils Initiative. State Water Board staff serve on the CDFA Environmental Farming Act Science Advisory Panel and participate in groups such as the CARB SB 1383 Dairy and Livestock Subgroups discussing research needs and alternate manure management practices.

Goal 4: Assess Implementation Costs

Stakeholders expressed concern that the cost to comply with hydraulic conductivity requirements of the Composting General Order may negatively impact the composting industry and compost use by either making the cost to comply more than is economically viable or driving the price of compost higher than what consumers are willing to pay. At the May 24, 2017 Promoting On-Farm Composting meeting led by CalEPA, stakeholders reported a small, herbivore-manure-only composting operation in the Central Valley would no longer be economically viable if required to comply with the Composting General Order as it would cost approximately \$500,000 to modify this existing facility to meet Tier II requirements. At the September 19, 2017 State Water Board meeting, stakeholders reported that this facility ceased operations. At that same meeting, stakeholders provided revised cost estimates between \$300,000 to \$400,000 to modify the facility. Staff received another cost estimate for compliance modifications at a different Tier II facility of approximately \$500,000. That facility is proceeding with implementing modifications. Additional discussion on the costs of compliance are included in this report in Section 4.2.3, Compliance Issues and Costs. Although Water Board staff received estimates for costs to modify two existing facilities, staff have not received estimates of the real costs of continuing business while implementing modifications, or the real costs to construct a new facility. Water Board staff have also not received information indicating whether the costs to comply with the requirements of the Composting General Order resulted in facilities modifying operations, such as changing feedstocks or reducing the volume of materials onsite to be eligible for Tier I or increasing the price of the finished product to compensate for the costs. If this information becomes available, it will be included in the annual report. Water Board staff understand that compliance modifications come at a cost. To make financial assistance information more readily accessible, staff posted links on the compost webpage to funding sources and financial aid available from multiple state agencies.

4. COMPOSTING OPERATIONS

4.1 COMPOSTING STATEWIDE

4.1.1. Permitting

Composting operations are typically regulated through WDRs. As shown in Table 3, Waste Discharge Requirement Types for Composting Operations Statewide, 71 composting facilities enrolled or are in the process of enrolling under the Composting General Order and 26 are operating pursuant to individual WDRs. An additional 13 are operating pursuant to Order No. R9-2014-0041, Conditional Waivers of Waste Discharge Requirements for Low Threat Discharges in the San Diego Region - Waiver No. 5: Discharges of Waste to Land at Composting Facilities (Region 9 Conditional Waiver). Six facilities filed a NONA and were determined to be exempt from the Composting General Order. A list of enrolled facilities is available on the compost webpage; the list is regularly updated and includes links to State Water Board database records.

Table 3. Waste Discharge Requirement Types for Composting Operations Statewide

Regional Water Board	Statewide Enrollees for the Composting General Order					Other Types of WDRs	
	Tier I Enrollees	Tier II Enrollees	Enrollment in Process	General Order Total	NONA*	Individual WDRs	Region 9 Conditional Waiver
1 – North Coast	0	0	5	5	0	0	
2 – San Francisco	1	1	2	4	0	2	
3 – Central Coast	1	4	2	7	0	1	
4 – Los Angeles	1	2	2	5	0	3	
5 – Central Valley	5	16	12	33	3	11	
6 – Lahontan	0	1	2	3	0	3	
7 – Colorado Riv.	0	2	0	2	0	2	
8 – Santa Ana	5	1	6	12	3	4	
9 – San Diego	0	0	0	0	0	0	13
Sub-Total	13	27					
TOTAL	40		31	71	6	26	13

*Operations submitted an acceptable Notice of Non-Applicability (NONA) to the Regional Water Board.

Table 3 was compiled for the purpose of tracking Composting General Order enrollment and does not represent all composting facilities statewide. Using data primarily from CalRecycle, it was estimated there were 153 composting facilities in the state in 2013. As of August 2018,

approximately 170 composting facilities are listed in CalRecycle and Water Board databases. Because of limitations inherent in database outputs, these numbers may not be reflective of all composting activities in the state.

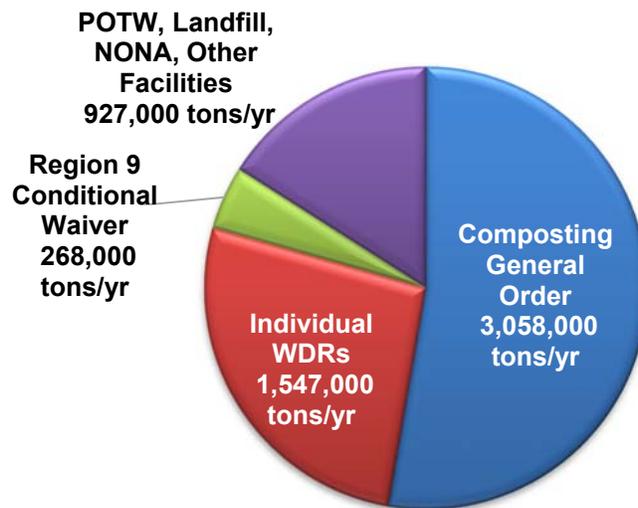
Facilities in Water Board databases are identified by primary facility type; a search for composting operations may not result in all facilities that conduct composting activities. For example, publicly owned treatment works (POTWs), landfills, transfer stations, and agricultural facilities may also be composting. The WDRs for the primary facility may also include requirements for composting operations. However, because the databases generally only include the primary facility type, the composting operations may not be identified through a search for a composting facility in a database. CalRecycle databases are searchable by the separate activities that may occur at one facility. However, the terms to describe composting activities are broad and may refer to other organic materials handling and processing activities. For example, a distributor of compost or mulch may appear as a composting facility in a CalRecycle database, but may not conduct active composting operations.

In addition to the limitations of Water Board and CalRecycle databases, site-specific conditions at composting operations may further complicate a comprehensive database search for statewide composting sites. For example, Regional Water Board staff may determine some composting operations only need to operate pursuant to the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Industrial Activities, Order 2014-0057-DWQ (Industrial General Permit) as the requirements of the Composting General Order may not be applicable, and the owner may submit a NONA. However, composting operations with NONAs do not always have database records nor are they required to be tracked in Water Boards databases. Therefore, the total number of composting facilities operating pursuant to individual WDRs shown in Table 3, does not match the estimated number from available databases. State Water Board staff will work to continue to improve transparency, communication, and collaboration with other regulatory agencies and stakeholders to clarify apparent discrepancies.

4.1.2. Volume Composted

According to CalRecycle records, approximately 5.8 million tons per year (t/y) of organic materials are composted statewide. As shown in Figure 2, Estimated Annual Compost Throughput by Regulatory Mechanism, approximately 84% of the statewide composting throughput, or approximately 4.8 million tons per year, occurs at composting operations enrolled or enrolling under the Composting General Order, or operating pursuant to individual WDRs or waivers. Of the statewide composting throughput, approximately 53% occurs at composting facilities operating pursuant to the Composting General Order, approximately 27% occurs at composting facilities operating pursuant to individual WDRs, and approximately 5% occurs at composting facilities currently operating pursuant to the Region 9 Conditional Waiver. Approximately 16% of the statewide composting throughput occurs at composting facilities that are co-located at POTWs, landfills, and facilities otherwise exempt from the Composting General Order; submitted an acceptable NONA to the Regional Water Board; or have another regulatory status.

Figure 2. Estimated Annual Compost Throughput by Regulatory Mechanism



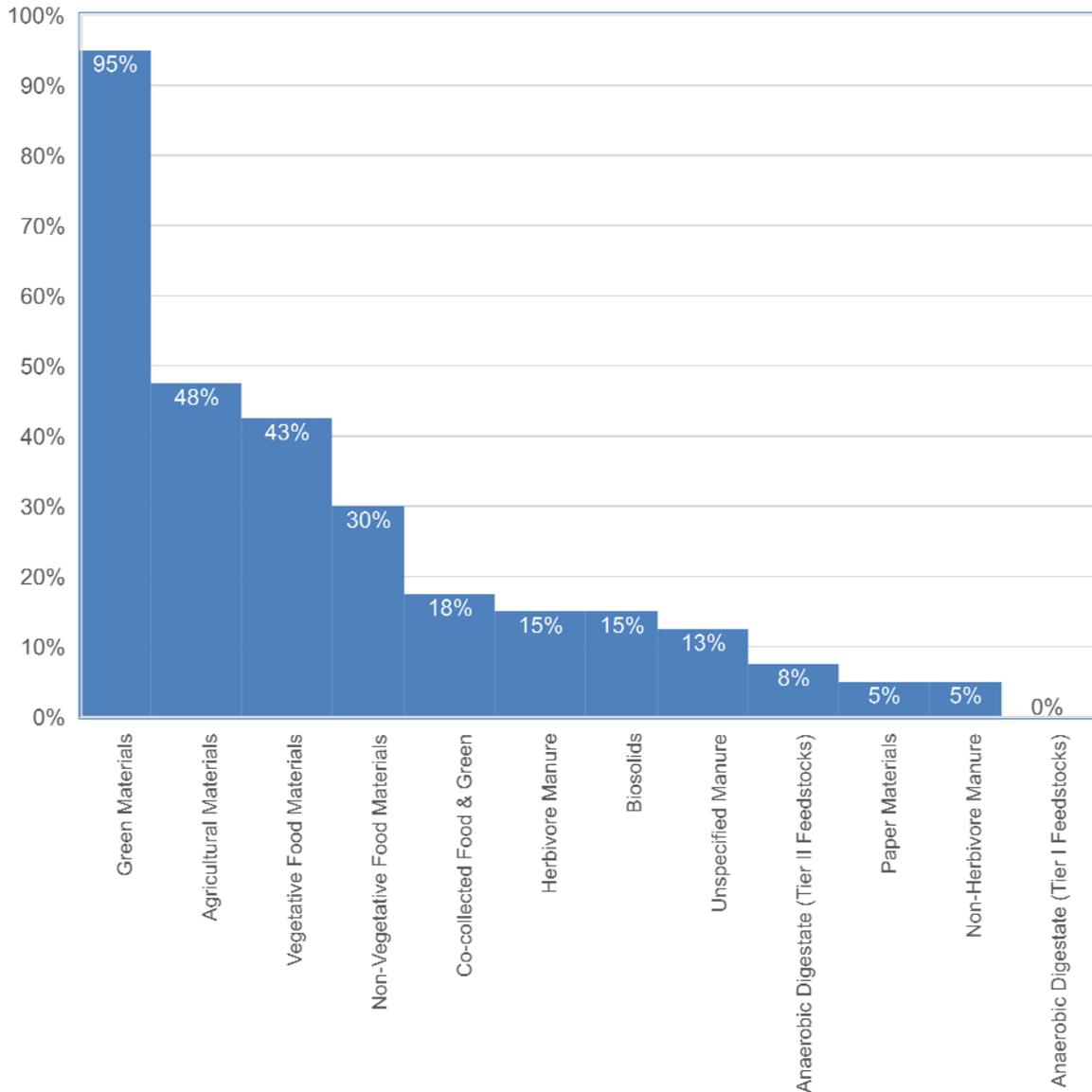
4.2 COMPOSTING FACILITIES ENROLLED UNDER WQ 2015-0121-DWQ

4.2.1. Feedstocks

Facilities composting under the Composting General Order may use a variety of feedstocks as well as additives and amendments. Certain feedstocks may only be composted at Tier II facilities. Feedstocks allowed at Tier I facilities include agricultural materials, green materials, paper materials, vegetative food materials, anaerobic digestate, and residentially co-collected food and green materials. Feedstocks allowed at Tier II facilities include non-vegetative food materials, biosolids (Class A, B, and/or Exceptional Quality [EQ]), manure, and anaerobic digestate. All Tier I feedstocks are acceptable at Tier II facilities. As shown in Figure 3, Feedstocks Used by Tier I and Tier II Facilities, a broad range of feedstocks are used at enrolled facilities. Approximately 95% of Tier I and Tier II facilities compost green materials. Facilities are composting food and paper materials that may have otherwise been disposed of in landfills, agricultural materials that may otherwise have been burned, and manure that may have otherwise been applied to land. By composting these materials, there may be net benefits to air quality through a reduction of greenhouse gas emissions.

Following adoption of the Composting General Order, stakeholders expressed concerns regarding requirements for composting manure. Figure 3 shows the estimated use of herbivore manure compared with non-herbivore manure at facilities enrolled in the Composting General Order. This comparison is an estimate because the Composting General Order did not require facilities to distinguish herbivore manure from non-herbivore manure; therefore, some enrollment documents and reports do not specify the type of manure used as feedstock. A more detailed discussion of manure management practices is included in Section 5.4, Manure Management.

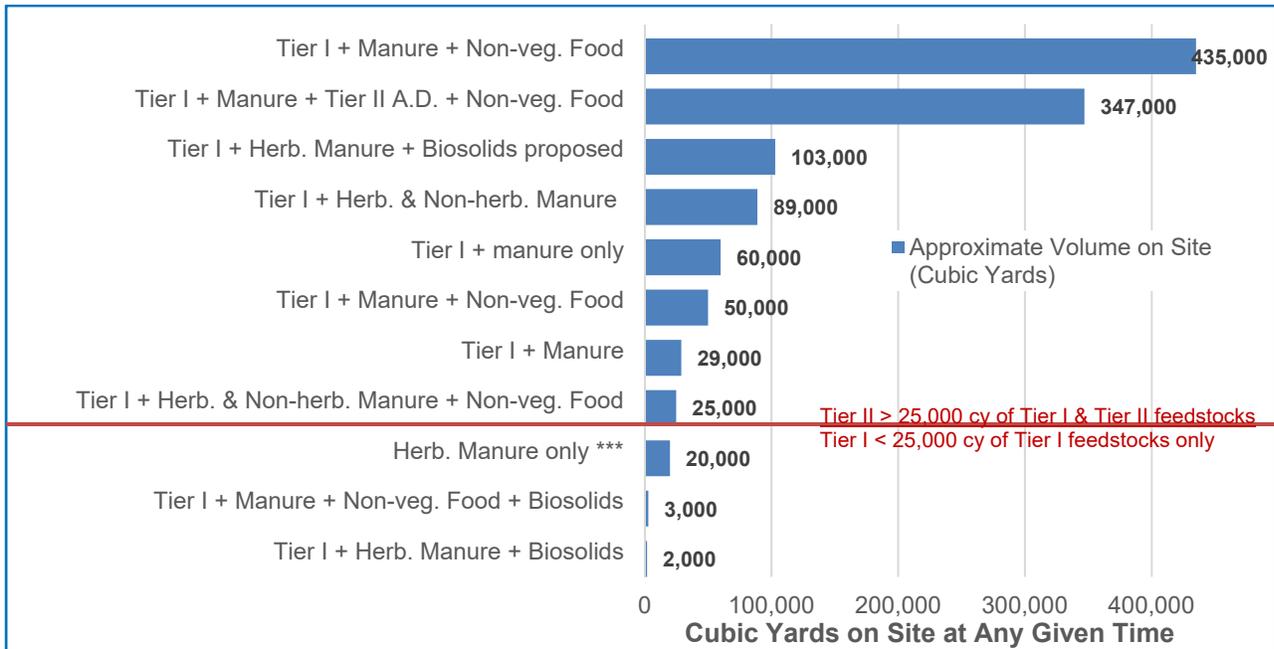
Figure 3. Feedstocks Used by Tier I and Tier II Facilities



Overall, eleven facilities (or 27.5%) use some type of manure as a feedstock. Each of these facilities is enrolled under Tier II. Figure 4, Volume and Feedstocks Composted at Manure-Composting Facilities, shows more information about the types of feedstocks used and volume of materials on site at these 11 facilities. Tier II facilities may use a combination of Tier I and Tier II allowable feedstocks. The types of feedstocks used at composting facilities that also compost manure are listed. Facilities that compost in volumes greater than 25,000 cubic yards are also required to meet Tier II specifications, regardless of the type of feedstocks. Three of the Tier II facilities that compost manure accept less material than the 25,000 cubic yard threshold. Two of these also accept either biosolids and/or non-vegetative food material, which are Tier II feedstocks. The third facility is not yet operating but proposes to compost herbivore manure only with an estimated volume of materials between 20,000 and 40,000 cubic yards. The Composting General Order may be revised in 2019 to remove herbivore manure as a Tier II

feedstock. If the Composting General Order was revised to allow herbivore manure in Tier I, only the proposed herbivore-manure-only facility may be impacted if the volume of materials on site remains below 25,000 cubic yards. All other facilities either have greater than 25,000 cubic yards of material and/or accept other Tier II feedstocks such as biosolids.

Figure 4. Volume and Feedstocks Composted at Manure-Composting Facilities



Abbreviations/Notes used in Figure 4:

Tier I	Tier I feedstocks include agricultural materials, green materials, paper materials, vegetative food materials, residentially co-collected or self-hauled food and green materials, and anaerobic digestate derived from allowable Tier I feedstocks.
Manure	Unspecified manure. Enrollment documents and reports do not specify whether the manure was sourced from herbivorous animals or non-herbivorous animals.
Non-veg. Food	Non-vegetative food material.
Tier II A.D.	Anaerobic digestate derived from allowable Tier II feedstocks.
Herb. Manure	Manure from herbivorous animals.
Non-herb. Manure	Manure from non-herbivorous animals.
Biosolids	Class A, B, and/or Exceptional Quality (EQ) biosolids.
***	Proposed site: estimated volume between 20,000 and 40,000 cubic yards

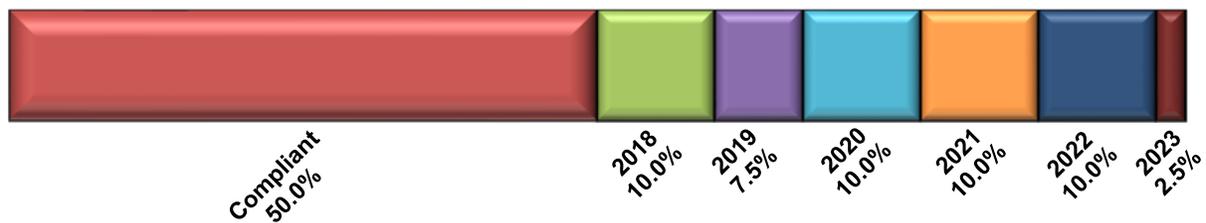
4.2.2. Compliance Approaches

The Composting General Order allows composters to achieve compliance in a phased approach. If this option is pursued, a plan must be submitted with proposed schedules for implementation of planned collection, control, and monitoring practices. Compliance schedules must not exceed six years from the date the Notice of Intent was submitted to the Regional Water Board, be supported with appropriate technical or economic justification, and be as soon

as practicable. The Regional Water Board Executive Officer may modify the schedules based on evidence that meeting the compliance date is technically or economically infeasible.

Composting operations enrolled under the Composting General Order have proposed compliance schedules within the six-year timeframe. Figure 5, Scheduled Year for the Completion of Compliance Modifications at Enrolled Facilities, presents a breakdown of the compliance schedules for the 40 fully enrolled composting facilities. Fifty percent of enrolled Tier I and Tier II facilities are compliant with the Composting General Order. Compliant facilities are either new facilities under development and constructed to the design specifications of the Composting General Order, existing facilities compliant upon enrollment, or existing facilities that completed compliance modifications in 2017.

Figure 5. Scheduled Year for the Completion of Compliance Modifications at Enrolled Facilities



As shown in Figure 6, Proposed Compliance Modifications at Tier I and Tier II Facilities, most Tier I facilities were already in compliance with Tier I specifications upon enrollment or are new facilities being designed to comply. Approximately one-third of the enrolled facilities are under Tier I. Tier II facilities may require more modifications to meet Composting General Order specifications. Only 22% of the enrolled Tier II facilities are compliant or are new facilities being designed to comply. Of the enrolled Tier II facilities, 41% are modifying all three containment features (working surfaces, drainage conveyance, and wastewater pond). Most enrolled Tier II facilities need to modify or build new wastewater ponds; nearly 20% of enrolled Tier II facilities will make improvements to wastewater ponds alone without modifying working surfaces or drainage conveyances. Of the enrolled Tier II facilities, none will improve working surfaces alone; all working surface improvements will be made in addition to other improvements. Figure 7, Number of Tier II Facilities Proposing Compliance Modifications, shows which modifications or combination of modifications the existing enrolled Tier II facilities plan to implement; these correspond to the same colors in the Tier II portion on the right side of Figure 6. Most Tier II facilities will need to modify working surfaces, drainage conveyance, and wastewater pond systems in combination. Only a small number will modify the drainage conveyance system or install a groundwater monitoring system alone. A greater number will need to modify the wastewater pond alone compared to those that will modify wastewater ponds and working surfaces in combination.

Figure 6. Proposed Compliance Modifications at Tier I and Tier II Facilities

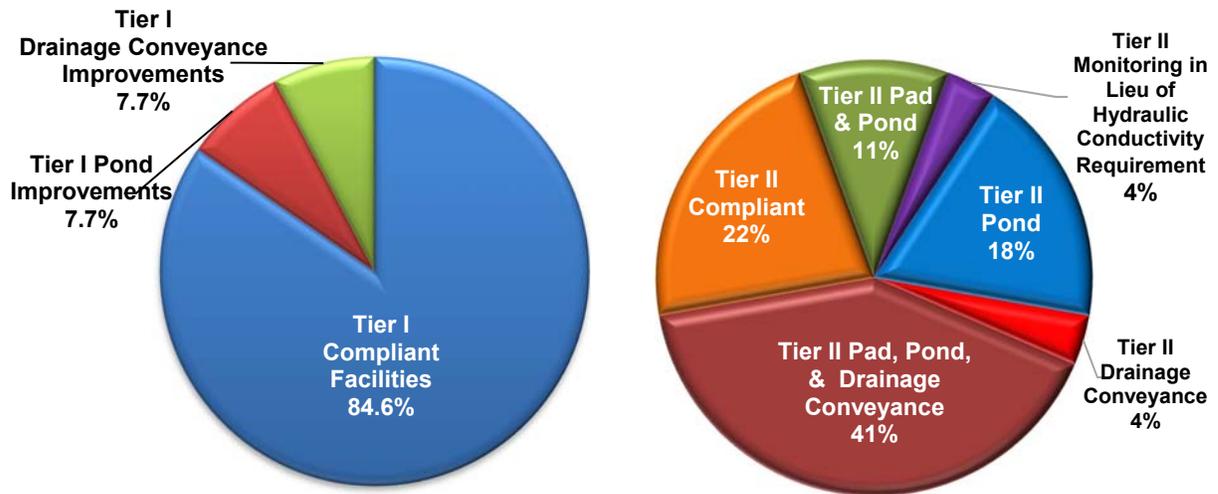
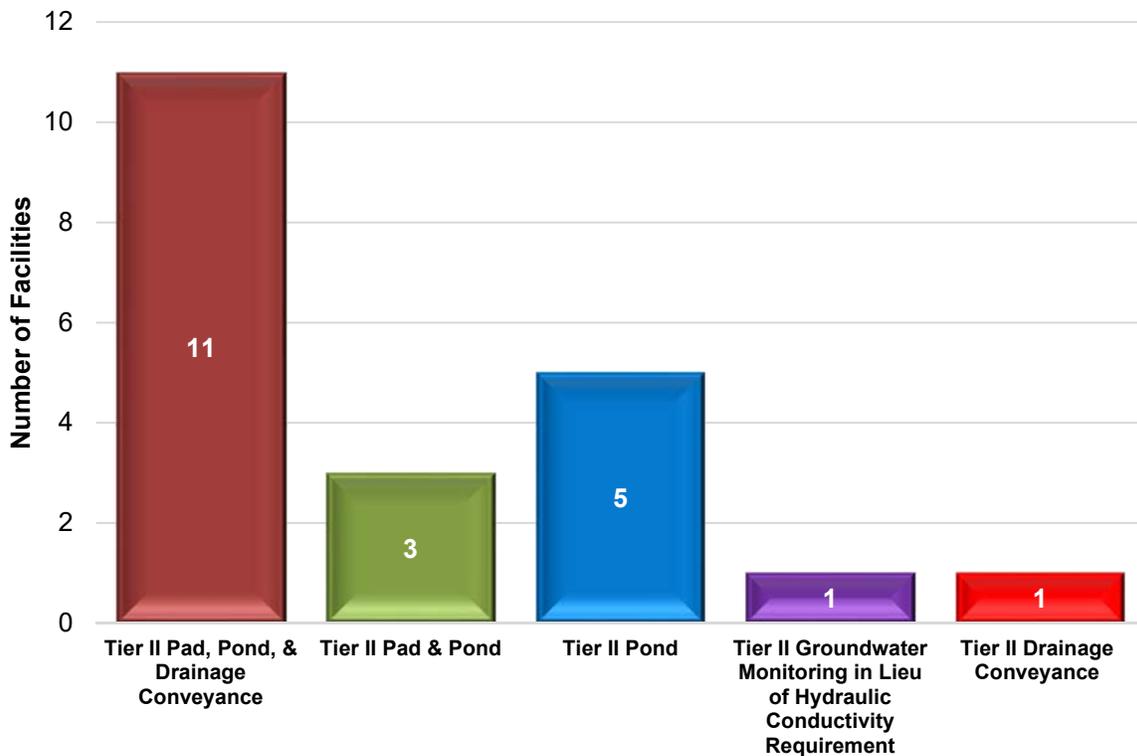


Figure 7. Number of Existing Tier II Facilities Proposing Compliance Modifications



Figures 8 and 9 show Tier II approaches to working surfaces and wastewater ponds modifications in further detail. Dischargers may propose engineered alternatives for the design and construction of ponds, working surfaces, and drainage ditches to demonstrate compliance with the requirements of the Composting General Order. Figure 8, Proposed Working Surface Improvements at Existing Tier II Facilities, shows that nearly half will not need to modify existing working surfaces. Of the Tier II facilities proposing working surface improvements, the majority are proposing compacted soil. As shown in Figure 9, Proposed Wastewater Pond Improvements at Existing Tier II Facilities, 71% of the Tier II facilities will need to improve existing wastewater ponds or install new ponds. Of these, most are either proposing to retrofit existing ponds alone or build entirely new ponds with compliant liner systems. Approximately 15% of Tier II facilities will both retrofit existing ponds and build new pond systems. Figures 7, 8, and 9 together show that pond modifications are a major factor for compliance at Tier II facilities.

Figure 8. Proposed Working Surface Improvements at Existing Tier II Facilities

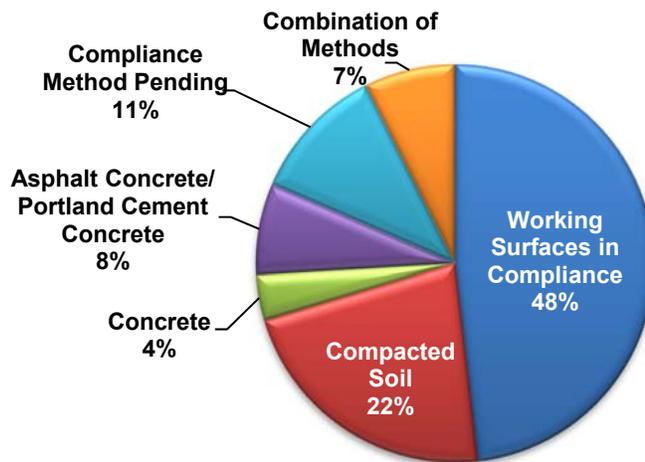
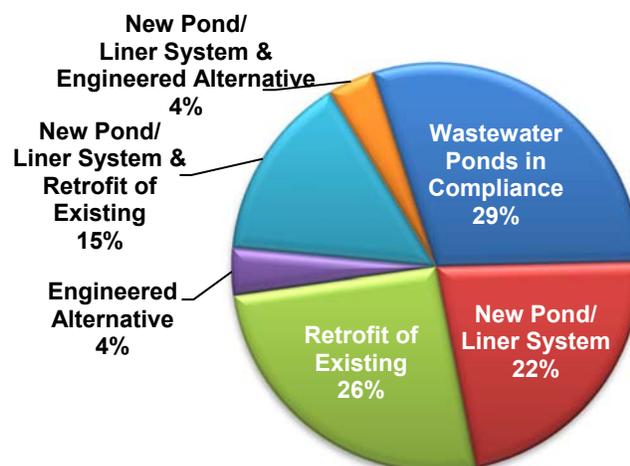


Figure 9. Proposed Wastewater Pond Improvements at Existing Tier II Facilities



4.2.3. Compliance Issues and Costs

Owners and operators of composting facilities are working toward meeting proposed schedules for compliance with the Composting General Order. State Water Board staff received quotes for the cost of modifying an existing facility to meet Tier II requirements. Stakeholders reported that a facility would need to spend approximately \$500,000 for the modifications necessary to meet Tier II requirements. Later, stakeholders provided revised cost estimates between \$300,000 to \$400,000 and reported that the facility ceased operations; however, the types of modifications were not specified for that facility. Staff also received compliance cost estimates for modifications to a different facility between \$500,000 and \$700,000 to meet Tier II requirements. This facility is proceeding with implementing modifications. At this facility, modifications include compacting and grading the working surfaces using native soil, installing a new pond, modifying the existing pond, and other site improvements. The site characteristics and the specific compliance choices at these two facilities may not be representative of the nearly 30 enrolled Tier II facilities. More cost estimates from a variety of facilities will help assess Composting General Order implementation costs; staff are seeking additional input from stakeholders. No compliance cost estimates were provided for Tier I facilities, however, most enrolled Tier I facilities are already in compliance with the requirements of the Composting General Order.

The EIR acknowledged that implementing the provisions of the Composting General Order will increase costs and that some facilities may cease operations due to economic considerations related to compliance costs. The Economic Considerations evaluation in Appendix D of the EIR compared estimated compliance costs with existing operating costs and existing net revenues for eight composting facilities that would ultimately be required to comply with Tier II requirements. The eight composting facilities represented a spectrum of private, public, and public-private partnered operations receiving 25,000 to 140,000 tons per year of multiple types of feedstocks, using a variety of composting techniques. The estimated change in cost margin for these eight facilities was calculated. The Economic Considerations evaluation also showed that compliance costs per unit of compost processed is a function of the size of the operation and the amount of compost processed annually.

Statewide initial capital investment estimates were provided in the final EIR. These estimates were based on general assumptions about the number and size of potentially effected existing composting operations and costs for a potential set of site modifications. CalRecycle estimated that 100 new composting facilities would be needed to compost the expected increase in diverted organic materials. The statewide initial capital investment estimates were anticipated for existing facilities only; estimating compliance costs for future facilities would be speculative. Many factors influence the initial capital costs for compliance modifications at specific sites. Because these estimates were not based on specific information from each of the existing composting facilities in 2015, the estimates can't be strictly correlated to the compliance cost estimates from actual facilities but they may be used to make general comparisons. In the final EIR, it was estimated that if all existing potential Tier II composting operations elected the groundwater monitoring option in lieu of upgrading their working surfaces to meet the minimum hydraulic conductivity of 1×10^{-5} cm/sec, the statewide initial capital investment cost could be approximately \$25 million to modify ponds and drainage conveyance systems and install groundwater monitoring wells. As a mid-range estimate, the statewide initial capital investment of installing a lime/cement treated pad, pond, and drainage conveyance system at all existing

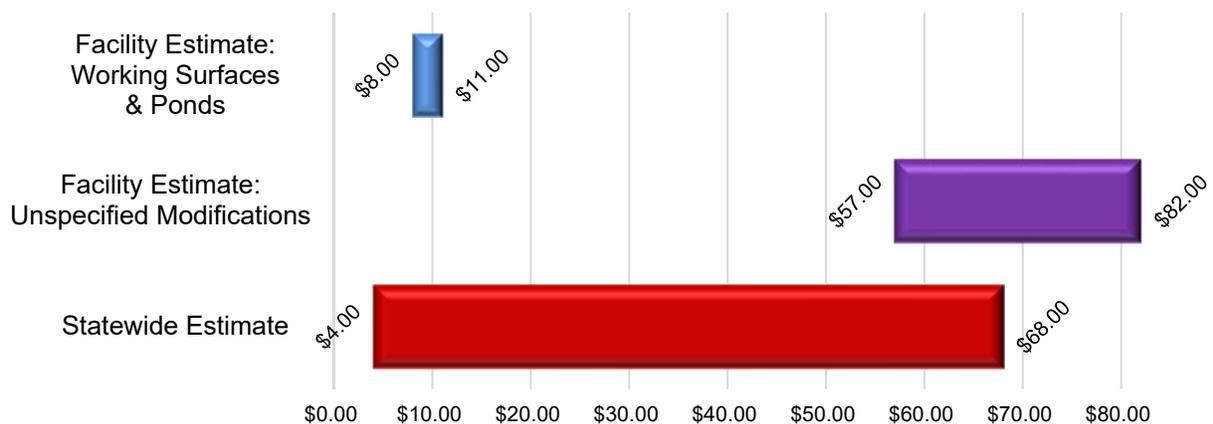
potential Tier II composting operations could be approximately \$140 million. On the high end, it was estimated that if all existing potential Tier II composting operations installed engineered concrete pads, ponds, and drainage conveyance, the statewide capital investment could be as much as \$450 million.

Figures 10 and 11, Estimated Cost per Acre for Tier II Modifications and Estimated Cost per Cubic Yard of Annual Compost Throughput for Tier II Modifications, show general comparisons between the compliance cost estimates staff received from two Tier II facilities and the estimated statewide initial capital investments provided in the EIR responses to comments. To correlate the two submitted cost estimates with statewide estimates, costs per acre and costs per cubic yard of annual compost throughput were projected; the ranges between both low and high estimates are shown. Compliance cost estimates for the two submitted cost estimates may be within the range of the estimated statewide initial capital investments provided in the response to comments as shown in Figures 10 and 11. The differences between these facilities may demonstrate the effect of economies of scale on the cost of compost production per cubic yard; other factors may be involved as discussed in the EIR Economic Considerations.

Figure 10. Estimated Cost per Acre for Tier II Modifications



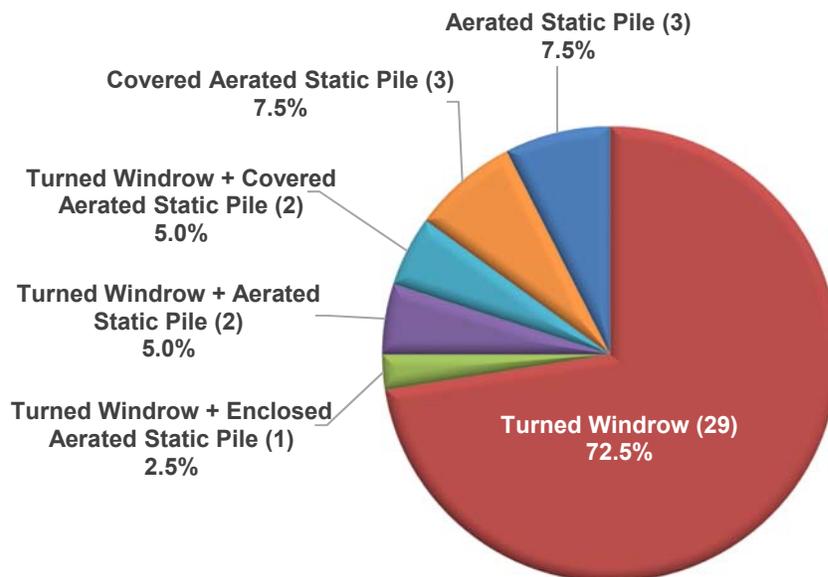
Figure 11. Estimated Cost per Cubic Yard of Annual Compost Throughput for Tier II Modifications



4.2.4. Composting Methods

A variety of composting methods are used throughout the state. Facility operators choose the method or combination of methods that best suit their operations, feedstocks, and local conditions. As shown in Figure 12, Composting Methods at Enrolled Facilities, the most common methods are turned windrow and aerated static pile. Of the 40 enrolled composting facilities, 72.5% of the enrolled composting operations use only the turned windrow method, and 15% use only variations of the aerated static pile method. The remaining facilities use a combination of these methods.

Figure 12. Composting Methods at Enrolled Facilities



4.3 COMPOSTING OPERATIONS WITH INDIVIDUAL WDRs OR REGION-SPECIFIC GENERAL WDRs

There are at least 26 composting facilities operating pursuant to individual WDRs. Most of those individual WDRs were adopted prior to the Composting General Order. Many of these are in accordance with California Code of Regulations, title 27, to require more protective measures due to the siting of the facility or the materials accepted. Of these facilities, 8 are co-located at landfills and requirements for the composting operations are incorporated in the WDRs for the landfill. Composting activities may also take place at other facilities such as confined animal facilities where compostable materials handling is regulated through operation-specific WDRs.

In addition, there are 13 composting facilities enrolled in the Region 9 Conditional Waiver. San Diego Water Board staff are communicating with facilities enrolled in this waiver to determine if those operations are appropriate to enroll under the Composting General Order. Eligible operations will be enrolled starting in 2019.

5. ORGANIC MATERIALS MANAGEMENT

5.1 GENERAL OVERVIEW

The requirements in the Composting General Order are intended to provide measures to protect against potential threats to water quality from composting operations. Stakeholders expressed interest in the manner in which the Water Boards oversee other organic materials management operations. In response to these comments, the Water Board directed staff to convene interagency work groups on organics management and land application, conduct education and outreach regarding land application of uncomposted green material, and engage in the Healthy Soils Initiative. The Composting General Order was developed to streamline permitting of composting operations with similar materials and operations; even though chip and grind and land application activities use similar materials as those used at composting facilities, these operations are regulated in a different manner because the activities are different from the composting process. This section discusses management of organic materials not occurring at composting facilities.

5.2 CHIP AND GRIND FACILITIES

The chip and grind process is not similar to the compost process. The chip and grind process involves mechanically reducing the size of green materials including tree and yard trimmings, untreated wood wastes, and natural fiber products. Organic material from chip and grind facilities can be used as feedstock for biomass energy, composting, or anaerobic digester facilities; or may be applied directly to land as a soil amendment. CalRecycle requires that chip and grind material may not be on site for more than 48 hours or up to 7 days with LEA approval and may not reach active composting temperatures. The time and temperature restrictions reduce the potential for materials to start composting, which in turn delays the biological decomposition of organic materials and the generation of leachate.

Although organic materials do not remain for long periods of time at chip and grind facilities, the materials may pose a threat to waters of the state unless managed appropriately. Due to the nature of these operations, chip and grind facilities may be more appropriately regulated under the Industrial General Permit or individual WDRs. As mentioned above, the time and temperature restrictions at these facilities delay generation of leachate and reduce the threat to groundwater quality. However, the operations may pose a threat to surface water from runoff of sediment and organic particulates. During the Composting General Order outreach process, State Water Board staff became aware that very few chip and grind facilities were enrolled under the Industrial General Permit. In response to this, State Water Board staff conducted education and outreach efforts to chip and grind operators in January 2017 by sending 75 notification letters regarding applicability of the Industrial General Permit to their facilities. In March 2018, 47 follow-up letters were sent to facilities that didn't respond and 18 letters were sent to newly identified facilities. Since the adoption of the Composting General Order in August 2015, an additional 30 chip and grind facilities have enrolled under the Industrial General Permit. Staff will continue outreach efforts to increase Industrial General Permit enrollment for chip and grind facilities.

5.3 LAND APPLICATION OF UNCOMPOSTED ORGANIC MATERIALS

Land application is the spreading of uncomposted organic materials on land such as rangeland and cropland. These materials are often size-reduced prior to spreading and may include grass clippings from curbside greenwaste collection, leaves, garden waste, plant trimmings, bark, agricultural plants, or food waste. Uncomposted organic materials may contain contaminants such as metals, pathogens, nutrients (e.g. nitrate), salts, or other waste constituents, and may harbor damaging insects. In addition, uncomposted organic materials from sources such as curbside waste collection may include contaminants such as trash, plastics, glass, metals, pet waste, and other materials. If not conducted appropriately, the application of uncomposted organic materials to land may impact surface and groundwater. Land application of uncomposted organic materials may be considered a discharge of waste to land. For example, the Regional Water Boards adopt orders which include requirements for irrigation and nutrient application to agricultural land in the Irrigated Lands Regulatory Program (ILRP). The application of green waste to agricultural lands must be accounted for in a grower's nutrient management plan. The orders require implementation of best management practices, and include conditions requiring water quality monitoring of receiving waters and corrective action when impairment is found.

Stakeholders expressed concern that the increased costs of producing compost due to meeting the requirements in the Composting General Order would create an incentive to directly land apply organic materials. State Water Board staff are working in close coordination with CalRecycle and LEA representatives on issues related land application and organic materials management. Currently, Water Board staff meet at least monthly with CalRecycle staff for organics touch base meetings and CARB interagency waste work group meetings in addition to land application coordination meetings.

In response to stakeholder concerns about land application, State Water Board staff conducted joint education and outreach meetings with Water Board's Office of Enforcement and CalRecycle staff. Information presented included CalRecycle and Water Boards' regulatory authority and enforcement mechanisms, what land application is, the potential environmental and water quality impacts from the land application of organic material, and how permits may be obtained. The first phase of education and outreach, beginning in January 2016, involved joint training for Regional Water Board and LEA staff in addition to presentations at five LEA roundtables across the state. State Water Board staff also published an informational pamphlet for distribution to attendees, and made it available on the Water Board's compost webpage. A hyperlink to the CalEPA Environmental Complaint System was also included on the Water Board's compost webpage. The second phase involved delivering the same message to the regulated community and other involved/interested parties. In April 2016, a joint presentation was given by CalRecycle and State Water Board staff at the Solid Waste Association of North America (SWANA) conference to convey information about composting and land application regulations. In further coordination with CalRecycle, State Water Board staff hosted two education and outreach stakeholder meetings regarding land application of compostable materials in conjunction with State Water Board performance measure outreach events on June 14, 2016 in Sacramento and June 23, 2016 in Riverside. The combined attendance for the June land application meetings was approximately 150 representatives including academia, state agency staff, and industry stakeholders. CalRecycle and Water Board staff collaborated on a

land application training series; Water Board staff will be presenting on these issues at a training series in December 2018.

As a result of this outreach program, State Water Board staff were notified of several land application locations with potential water quality issues. Some of the sites were known and investigations and enforcement actions are ongoing. Preliminary investigations revealed that land application activities have been occurring for nearly a decade, prior to the development of the Composting General Order.

Since the adoption of the Composting General Order in August 2015, nine sites of potentially illegal application of uncomposted organic materials to land were identified that may pose a threat to water quality and beneficial uses, as shown in Table 4, Summary of Land Application Enforcement Cases. These sites include ongoing cases, sites discovered by Regional Water Board staff or the LEA, or sites reported by a public complaint. These activities are known to be taking place in the Los Angeles, Central Valley, Santa Ana, and San Diego Regions. There are currently five active enforcement cases located in the Central Valley, Santa Ana, and San Diego Regions. Of these, two were recently discovered and are pending inspection and potential violation determination by Regional Water Board staff and the LEA. Water Board staff issued nine Notices of Violation (NOV) and the San Diego Regional Water Board issued one Cleanup and Abatement Order (CAO). In the Central Valley, two are ongoing cases involving collaboration with the LEA, which may result in further enforcement actions such as issuances of NOV, California Water Code Section 13260 or 13267 violations, CAOs or an Administration Civil Liability (ACL) by Water Board's Office of Enforcement. There are 3 sites that were recently investigated by both Regional Water Board staff and the LEA after receiving a public complaint. These sites were determined to be in violation of one agency's regulations/requirements and not the other, or both agencies determined that the land application of uncomposted organic material (i.e. mulch) was conducted at a proper rate meeting CalRecycle's land application standards, and not posing a threat to water quality or public health.

In coordination with LEAs, CalRecycle, and the State Water Board, Central Valley Regional Water Board staff performed enforcement on another type of recently-identified illegal land application site involving disposal of compost "overs" to land. "Overs" are large-diameter pieces of mulch, wood, or clumps of organic material, usually containing municipal solid waste such as glass, film plastic, and paper products, and are a result of screening compostable materials for processing. In this case, overs were being disposed in thick layers in a ravine. In collaboration with the Central Valley Regional Water Board, the LEA (lead agency) issued a NOV requiring the removal of all illegally disposed material by August 2018. To date, several thousand tons of material have been removed from the site and hauled to a nearby landfill. The removal of waste material is continuing and the case is ongoing. Because overs are a difficult material to handle and landfills are trying to divert organic material from disposal, Water Board staff anticipate these practices may become more common.

Water Board enforcement staff actively investigate complaints as resources allow and will continue collaboration with CalRecycle and LEA staff on land application and enforcement issues.

Table 4. Summary of Land Application Enforcement Cases

Summary of Land Application Enforcement Cases Since the Adoption of the Composting General Order (2015 to 2018)								
Regional Water Board	No. of Cases ¹	Enforcement Pursued				Active Cases ²	Pending Inspection and Violation Determination ³	No Threat to Water Quality Determination by Regional Water Board ⁴
		Notice of Violation (NOV)	CWC 13260 & 13267 Violation Letters	Cleanup and Abatement Order (CAO)	Administrative Civil Liability (ACL)			
1 – North Coast	0	-	-	-	-		-	-
2 – San Francisco	0	-	-	-	-		-	-
3 – Central Coast	0	-	-	-	-		-	-
4 – Los Angeles	1	0	0	0	0	0	0	1
5 – Central Valley	3	6	0	0	0	2	1	1
6 – Lahontan	0	-	-	-	-		-	-
7 – Colorado Riv.	0	-	-	-	-		-	-
8 – Santa Ana	2	1	0	0	0	1	0	0
9 – San Diego	3	2	0	1	0	2	1	0
TOTAL	9	9	0	1	0	5	2	2

Notes:

1. An individual case may include multiple enforcement actions. This total includes active and inactive cases as recorded by the Regional Boards between 2015 and 2018.
2. "Active Cases" are cases that are currently active or pending enforcement.
3. The number of cases the Regional Boards are aware of but have not yet been inspected or have recently been inspected but the determination of the type of violation is pending.
4. The number of sites the Regional Boards have inspected in coordination with other agencies (e.g. LEA) and determined there were no violations or threats to water quality.

5.4 MANURE MANAGEMENT

California’s agriculture contributes significantly to the state economy and commodity export. The Central Valley is the largest agricultural region in California and is one of the world’s most productive agricultural areas. In addition to crop production, agricultural operations include animals, such as chickens, cows, sheep, goats, and pigs. Many of these operations are known as Confined Animal Facilities, which are farms or ranches, including dairies, where livestock are held for a significant part of the time and are provided food, as opposed to grazing. These operations produce large quantities of manure that must be managed appropriately to prevent water quality impairment. Materials such as manure may pose a higher threat to water quality due to concentrations of constituents such as pathogens, nitrates, and salts.

To reduce impacts to water quality from manure, the Central Valley Regional Water Board adopted a comprehensive Dairy General Order, Waste Discharge Requirements General Order No. R5-2013-0122 for Existing Milk Cow Dairies, which includes requirements for corrals, production areas, ponds, and land application areas, applicable to dairies that existed as of October 17, 2005. Any new dairies, or dairies that expanded since 2005, may not be eligible for coverage under the Dairy General Order and may be subject to individual WDRs. The Central Valley Regional Water Board also adopted general WDRs applicable to feedlots in the Confined Bovine Feeding Operations General Order on June 8, 2017. The Dairy Representative

Monitoring Program is evaluating manure management at dairies and will make recommendations for best management practices. The goal of the Representative Monitoring Program is to identify on-farm management practices that are protective of groundwater quality. Data and analysis from the final report due in 2019 will likely aid in determining appropriate protective requirements for manure management at dairies.

At agricultural operations, a variety of methods are used to manage manure, including land spreading, anaerobic digestion, and composting. As shown in Figure 3, Feedstocks Used by Tier I and Tier II Facilities, approximately 33% of enrolled composting facilities use manure as feedstock. Enrollees under the Composting General Order are primarily commercial operations and only one is located adjacent to a confined animal facility. Stakeholders are concerned that the requirements of the Composting General Order are cost-prohibitive to compost manure on farms. The Composting General Order was not intended to apply to composting conducted on farms to manage manure or create compost for on-farm use. State Water Board staff are proposing to revise an exemption in the Composting General Order to further encourage on-farm composting and the use of compost on farms.

Stakeholders have also expressed concern with imposing the same requirements on herbivore manure composting as non-herbivore manure composting. The EIR, while not distinguishing between herbivore and non-herbivore manures, evaluated and determined that materials such as manure are more appropriately handled at Tier II composting operations. The analysis discussed why composting nutrient-rich feedstocks on coarse-textured soils where there are no barriers to soil-water movement has the potential to create elevated nitrate concentrations in groundwater. State Water Board staff are currently reviewing the requirements for herbivorous animal manure to see if appropriate revisions should be made to the Composting General Order. Revisions to the Composting General Order may be presented to the State Water Board for adoption in 2019. Waste discharge requirements for confined animal facility operations may already address manure handling and storage; therefore, additional coverage under the Composting General Order may not be necessary. State Water Board staff are proposing to revise the Composting General Order to clarify this point.

5.5 CALIFORNIA HEALTHY SOILS INITIATIVE

The California Department of Food and Agriculture (CDFA) is the agency responsible for leading California's Healthy Soils Initiative. In collaboration with other state agencies and departments, the goal of the Healthy Soils Initiative is to promote the development of healthy soils on California's agricultural lands. Health of agricultural soil relates to its ability to build and retain adequate soil organic matter through the activity of plants and soil organisms. Soils with adequate soil organic matter have the capacity to function as vital living ecosystems that sustain and produce food for plants, animals, and humans, and increase carbon sequestration and reduce overall greenhouse gas emissions. An important connection between healthy soils and the streamlined permitting of composting facilities provided through the Composting General Order is that the proper application of compost can be used to increase soil organic matter and contribute to soil health.

State Water Board staff are continually engaged in the California Healthy Soils Initiative. State Water Board staff have met with staff from CDFA, CalRecycle, CalEPA, CARB, Department of

Pesticide Regulation, and the California Natural Resources Agency at more than twenty interagency meetings from the autumn of 2015 to the present. Meetings include the Environmental Farming Act Science Advisory Panel, California Agriculture Partnership Forum, workgroups associated with Assembly Bill No. 1045 (Irwin; Organic waste: composting. 2015–2016 Reg. Sess.; Stats. 2015, ch. 596), the California Roundtable on Agriculture and the Environment, monthly Healthy Soils Interagency Meetings, meetings for the Healthy Soils Initiative, and CARB SB 1383 subgroup meetings regarding alternate manure management practices and dairy digester research needs.

6. SUMMARY

The application of compost is one of several sustainability practices promoted by California's Healthy Soils Initiative. Compost helps retain soil moisture, provides nutrients, and may reduce irrigation needs and runoff potential. With several goals for diversion of organic materials from landfills, composting operations are critical in supporting both diversion efforts and the Healthy Soils Initiative. Although compost is a beneficial product, composting operations may pose a threat to water quality through the discharge of leachate or wastewater with high concentrations of nitrogen, phosphorus, metals, and pathogens. The State Water Board adopted the Composting General Order to provide a streamlined mechanism to support the production of compost while protecting water quality.

The Composting General Order was developed concurrently with CalRecycle's implementation of the diversion of organic materials from landfills and in support of the Healthy Soils Initiative, with the primary goals of providing statewide consistency and minimum standards for water quality protection. Stakeholders are concerned that implementing the Composting General Order will impact the statewide composting infrastructure as well as the attainment of legislative mandates for waste diversion. Most of the focus centered on the timing and costs of compliance, the ability of the composting facilities to construct the required protection measures, and the diversion of organic material away from composting facilities to related activities such as chip and grind facilities and direct application of uncomposted materials to land. In order to address these concerns, State Water Board staff met with industry stakeholders to develop performance measures. The performance measures included reporting requirements for enrollment in the Composting General Order and collaborating with other agencies to ensure consistent and transparent communication and regulation.

Upon evaluation, the process for enrolling under the Composting General Order is a much more efficient process than developing individual waste discharge requirements for a facility. Most of the facilities responsible for composting organic material have either enrolled or are in the process of enrolling under the Composting General Order, are operating pursuant to individual waste discharge requirements, or are operating pursuant to a conditional waiver of waste discharge requirements. Through education and outreach activities, State Water Board staff became aware of land application activities that were previously unknown to the state. Some of these activities have been occurring for years prior to the development of the Composting General Order, but State Water Board staff are collaborating with other agencies for further investigation and enforcement action as necessary. State Water Board staff continue to meet with other agencies and interested stakeholders on topics such as organics management, Healthy Soils, sustainable agriculture, and tracking of organic material through diversion efforts to ensure transparency and collaborative communication. State Water Board staff are in the process of evaluating requirements in the Composting General Order related to agricultural operations and manure management practices. Revisions to the Composting General Order are anticipated to be presented to the State Water Board for consideration in 2019. State Water Board staff intend to annually update this report to reflect current activities related to organic materials management and the Composting General Order.

APPENDIX A – GLOSSARY OF TERMS

Beneficial Uses - potential uses of waters of the state to be protected against quality degradation. Beneficial uses include but are not limited to domestic, municipal, agricultural and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. (Wat. Code, § 13050)

Composting - Composting is the biological decomposition of organic materials by microorganisms under controlled aerobic conditions to create a product (e.g., soil amendment or soil blend). Compostable materials comprise a wide range of material types: grass, leaves, branches, prunings, stumps, wood waste, agricultural materials, manure, food, and biosolids.

Discharger – any person who discharges waste that could affect the quality of waters of the state, and includes any person who owns a waste management unit or who is responsible for the operation of a unit. (Cal. Code Regs., tit. 27, § 20164)

General WDRs – a regulatory order that pertains to a group of waste management units that employ similar operations, waste types, and treatment standards. (Wat. Code, § 13263, subd. (i))

GeoTracker – an internet-accessible database system used by the Water Boards and local agencies to track and archive compliance data from authorized or unauthorized discharges of waste to land, or unauthorized releases of hazardous substances from underground storage tanks. GeoTracker consists of a relational database, on-line compliance reporting features, a geographic information system (GIS) interface, and other features utilized to input, manage, or access compliance and regulatory tracking data. (Cal. Code Regs., tit. 23, §§ 3891–3895)

Groundwater – water below the land surface that is at or above atmospheric pressure. (Cal. Code Regs., tit. 27, § 20164)

Leachate – any liquid formed by drainage of liquids from waste or the percolation of liquid through waste, including any dissolved or suspended constituents extracted from waste. (Cal. Code Regs., tit. 27, § 20164)

Liner – a continuous layer of natural or artificial material, a continuous membrane of flexible artificial material, or a continuous composite layer consisting of a membrane of flexible artificial material directly overlying a layer of engineered natural material. The liner is installed beneath or on the sides of a waste management unit and acts as a barrier to both vertical or lateral fluid movement (Cal. Code Regs., tit. 27, § 20164)

Operator – the person(s) responsible for the overall operation of a facility or part of a facility. (40 C.F.R., § 258 (1996))

Owner – the person(s) who owns a facility or part of a facility. (40 C.F.R. § 258 (1996))

POTWs – publicly owned treatment works, i.e. wastewater treatment facilities

Threat to Water Quality (TTWQ) – a rating used to determine the relative threat of discharges of waste that could cause the degradation, impairment, or long-term loss of a designated beneficial use of the receiving water. (Cal. Code Regs., tit. 23, § 2200)

Waiver – a regulatory order that may be issued in lieu of WDRs for a specific discharge or a specific type of discharge. Requirements for WDRs may be waived by the Regional Water Board if it determines that the waiver is consistent with any applicable water quality control plan and is in the public interest. (Wat. Code, § 13269)

Waste Discharge Requirements (WDRs) – a formal set of requirements prescribed and adopted by the Regional Water Boards as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge, with relation to conditions existing in the disposal area or receiving waters upon, or into which, the discharge is made or proposed. The requirements implement any relevant water quality control plans that have been adopted, and take into consideration the beneficial uses. (Wat. Code, § 13263; Cal. Code Regs., tit. 27, § 21720).

Waters of the State – any surface water or groundwater, including saline waters, within the boundaries of the state (Wat. Code, § 13050).

APPENDIX B – LIST OF ACRONYMS AND ABBREVIATIONS

<i>AB 901</i>	<i>Assembly Bill No. 901 (Gordon. Solid waste: reporting requirements: enforcement. 2015–2016 Reg. Sess., Stats. 2015, ch. 746)</i>
<i>CalEPA</i>	<i>California Environmental Protection Agency</i>
<i>CalRecycle</i>	<i>California Department of Resources Recycling and Recovery</i>
<i>CARB</i>	<i>California Air Resources Board</i>
<i>CDFA</i>	<i>California Department of Food and Agriculture</i>
<i>CPLX</i>	<i>Complexity</i>
<i>EIR</i>	<i>Environmental Impact Report</i>
<i>ILRP</i>	<i>Irrigated Lands Regulatory Program</i>
<i>LEA</i>	<i>Local Enforcement Agency</i>
<i>NOA</i>	<i>Notice of Applicability</i>
<i>NOI</i>	<i>Notice of Intent</i>
<i>NONA</i>	<i>Notice of Non-Applicability</i>
<i>NPDES</i>	<i>National Pollutant Discharge Elimination System</i>
<i>Regional Water Board</i>	<i>Regional Water Quality Control Board</i>
<i>ROWD</i>	<i>Report of Waste Discharge</i>
<i>SB 1383</i>	<i>Senate Bill No. 1383 (Lara. Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills. 2015–2016 Reg. Sess., Stats. 2016, ch. 395)</i>
<i>State Water Board</i>	<i>State Water Resources Control Board</i>
<i>Title 27</i>	<i>California Code of Regulations, title 27</i>
<i>TTWQ</i>	<i>Threat to Water Quality</i>
<i>Wat. Code</i>	<i>California Water Code</i>
<i>WDRs</i>	<i>Waste Discharge Requirements</i>

APPENDIX C – GROUNDWATER MONITORING ANALYTICAL RESULTS SUMMARY

The following groundwater monitoring results include a summary table from a Tier II facility showing data for 2017 through the first quarter of 2018. Analytical data was collected from groundwater monitoring wells on site. Each well was sampled for the following parameters which are provided in Table B-3 of the Composting General Order Monitoring and Reporting Program, which may be used to indicate a release from the facility:

- **Field Parameters** - temperature, specific conductance, turbidity, dissolved oxygen (DO), oxidation-reduction potential (ORP);
- **Monitoring Parameters** - pH, chloride, nitrate (as N), sodium, total coliform organisms, total dissolved solids (TDS).

Results of the first quarter 2018 and the annual 2017 compliance groundwater sampling events were compared to the Basin Plan Water Quality Objectives (WQOs). The WQOs include current California Code of Regulations, Title 22 Primary & Secondary Maximum Concentration Limits (MCLs) for municipal drinking water.

For the first quarter 2018 sampling event, with exception of the following, no field parameters or monitoring parameters exceeded their respective WQOs:

- **Field Parameters**
Specific conductance exceeded the secondary MCL (900 microseimens per centimeter [$\mu\text{S}/\text{cm}$]) in groundwater samples collected from monitoring wells at concentrations ranging from 1,135 mS/cm to 1,858 mS/cm.
- **Monitoring Parameters**
Concentrations of total dissolved solids (TDS) exceeded the secondary MCL (500 milligrams per liter [mg/L]) in groundwater samples collected from monitoring wells at concentrations ranging from 685 mg/L to 1,130 mg/L.

For the 2017 annual monitoring period, with exception of the following, no field parameters or monitoring parameters exceeded their respective WQOs:

- **Field Parameters**
Specific conductance exceeded the secondary MCL (900 microseimens per centimeter [$\mu\text{S}/\text{cm}$]) in groundwater samples collected from monitoring wells at concentrations ranging from 1,174 mS/cm to 2,302 mS/cm.
Turbidity exceeded the MCL (5.0 Nephelometric Turbidity Units [NTU]) ranging from 5 to 39 NTU.
- **Monitoring Parameters**
Concentrations of total dissolved solids (TDS) exceeded the secondary MCL (500 milligrams per liter [mg/L]) in groundwater samples collected from monitoring wells at concentrations ranging from 675 mg/L to 1,240 mg/L.

Exceedances were reported for select WQOs during the 2017-2018 monitoring period, however they did not represent measurably significant indications of a release from the site. Additionally, it was determined that these are existing conditions not attributable to facility operations and do not indicate a release from the site.

Groundwater Analytical Results

	Units	MDL	MCL ¹ /WQO ²	2017	2017	2017	2017	2018
				Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1
FIELD PARAMETERS³								
Temperature	deg. C	NE	NE	20 - 22	23 - 25	25	23 - 24	17 - 23
Specific Conductance	µS/cm	NE	900	1,367 - 2,302	1,174 - 2,002	1,226 - 2,087	1,241 - 2,122	1,135 - 1,858
Turbidity	NTU	NE	5.0	5 - 39	2	1 - 2	1 - 2	1 - 2
Dissolved Oxygen (DO)	mg/L	NE	NE	5	2 - 3	0 - 3	2 - 3	2 - 3
Oxidation-Reduction Potential (ORP)	mV	NE	NE	199 - 210	133 - 186	98 - 118	84 - 95	120 - 153
MONITORING PARAMETERS								
pH	pH Units	NE	6.5 to 8.5	7.5 - 7.5	7.4 - 7.8	7.5 - 7.8	7.4 - 7.7	7.2 - 7.5
Chloride	mg/L	0.76	250	130 - 170	130 - 190	130 - 170	130 - 170	130 - 170
Nitrate (as N)	mg/L	0.029	10	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1
Sodium	mg/L	0.103	NE	220 - 554	220 - 409	223 - 417	230 - 422	240 - 421
Total Coliform Organisms ⁴	MPN/100mL	1.1	1.1	-	-	-	-	-
Total Dissolved Solids (TDS)	mg/L	0.87	500	695 - 1,240	680 - 1,230	675 - 1,220	710 - 1,240	685 - 1,130

Notes:

1 - Primary or Secondary MCL, California Code of Regulations, Title 22; Tables 64431-A, 64444-A, 64449-A and B

2 - Basin Plan WQO (Water Quality Objective)

3 - Field parameters monitored to confirm stability of groundwater prior to sampling; pH is also a stabilization parameter but listed under monitoring parameters to assess compliance.

4 - MRL (Method Reporting Limit) provided by laboratory; no MDL available for listing.

" - " Not detected at concentrations greater than or equal to the MRL/MDL.

MCL - Maximum Contaminant Level for drinking water.

MDL - Method Detection Limit. The listed MDL is applicable to undiluted samples. MDLs for samples run at dilutions other than 1 are listed in Appendix B, Laboratory Analytical Certificate

µS/cm - microseimens per centimeter
mg/L milligrams per liter
mV - millivolts
mL - milliliter

MPN - Most Probable Number

NE - Not Established

NTU - Nephelometric Turbidity Units