

King County Organics Market Development Plan

Prepared in accordance with
Ordinance 18835, Section 102, Proviso P2

August 2019



King County

Department of Natural Resources and Parks
Solid Waste Division

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Executive Summary

The King County Council, via a proviso in the King County 2019-2020 adopted budget Ordinance (Section 102, Proviso P2), requested the Executive to submit an Organics Market Development Plan (Organics Plan) to expand and enhance the regional market for compost that is produced using the county's organics stream. The intent of the Organics Plan is to develop new uses to increase local demand which will help divert organic materials (food, yard, wood and compostable paper) from the Cedar Hills Regional Landfill through recycling.

It is King County's goal to achieve zero waste of resources by 2030. This goal is contained in King County Code 10.14.020¹, the Strategic Climate Action Plan², and the 2019 Comprehensive Solid Waste Management Plan³. Recovering organic material is an essential part of reaching this goal. The Solid Waste Division (SWD) of the Department of Parks and Natural Resources (DNRP) works to divert these materials from the Cedar Hills Regional Landfill.

In 2018, organic materials comprised more than 35 percent of what was disposed at Cedar Hills Landfill⁴. This represents a significant wasted resource as this organic material could be utilized to improve water quality and soil plant health, and reduce climate impacts. King County relies on the private sector to collect and process organic materials. Current processing in the region is at 85 percent permitted capacity, meaning that in order to reach King County's goals; more capacity will be needed in the future.

The current market demand (by government agencies, landscapers, homeowners and others) for compost synchronizes with supply of material produced, however to recycle more material, additional markets are needed to incentivize additional composting (or other organics technology) processing capacity. At the same time, contamination of the organics stream in the form of plastic and glass disposed of at the curb in recycling containers by residents and business is a barrier to high quality compost. High quality compost is critical for markets to be strong, sustained and to expand.

As part of the development of this Organics Plan, SWD contracted with Cascadia Consulting Group on the Organics Materials Management Report⁵ documenting and analyzing the organics management system for King County. The report is comprised of two parts:

- Regional organic material data, presenting trends in disposal and recovery of organic materials, including food scraps and yard trimmings;
- King County Organics Market Assessment, an update of local organics market conditions, (previously documented in 2017 and 2015), an extensive literature review covering best practices from across the country, and summarizing relevant

¹ [King County Code 10.14.020](#).

² [Strategic Climate Action Plan](#).

³ [2019 Comprehensive Solid Waste Management Plan](#).

⁴ An infographic setting out the regional organic system can be found in the addendum to this plan.

⁵ [Organic Materials Management in King County](#).

trends related to King County's organics supply, processing, and end market demand.

The study notes there are many organics management challenges for the region, including mitigating contamination across all stages of the supply chain, as well as ensuring adequate organics processing capacity for the quantity of organics generated by residents and businesses.

In response to this proviso, this Organics Plan identifies a role for King County government to expand and enhance the market for organics and compost. It organizes the issues facing organics in the region into three categories of response – 1) enhance and expand the local market for compost; 2) reduce contamination and materials which are currently disposed which could be recycled (also referred to as wasted resources); and 3) expand organic material processing.

1. Enhance and expand the local market for compost – target recommendations to increase the purchase of compost in the region:
 - *Recommendation 1-A: Provide technical assistance to King County agencies to increase compost use in county projects*
 - *Recommendation 1-B: Use compost for closed landfill cover biofiltration enhancement pilot project*
 - *Recommendation 1-C: Increase compost use on King County owned farmland pilot*
 - *Recommendation 1-D: Soil restoration at Parks and Recreation Division post demolition sites*
 - *Recommendation 1-E: Explore incentives for compost use in King County's green building practices*
 - *Recommendation 1-F: Review post-construction soil standards for compost use and compliance*
2. Reduce wasted resources and contamination – a multi-cultural strategy focusing on the need to reduce contaminants in the organics waste stream:
 - *Recommendation 2-A: Regional contamination reduction outreach campaign*
3. Expand organic material processing – identifies opportunities that could lead to additional regional organics processing:
 - *Recommendation 3-A: Explore commercial food waste processing to enhance wastewater gas production*
 - *Recommendation 3-B: Support regional organics processing in appropriately zoned areas*
 - *Recommendation 3-C: Explore feasibility of local organics processing at the Vashon Island Recycling Transfer Station*

This Organics Plan identifies that additional budget authority is necessary to conduct part

of the SWD biofiltration⁶ enhancement pilot project to use compost as a cover on three closed landfill sites (*Recommendation 1-B*). It is anticipated that this request will be included in a subsequent budget ordinance. Other recommendations that involve SWD will be paid for through the existing budget. No code changes are needed to implement any of the pilot projects.

Proviso Text

Ordinance 18835, Section 102, Proviso P2:

Of this appropriation, \$250,000 shall not be expended or encumbered until the executive transmits a plan identifying actions and recommendations that the county can take to expand and enhance the regional market for compost that is produced using the county's organics stream and a motion that should acknowledge receipt of the plan and reference the subject matter, the proviso's ordinance, ordinance section and proviso number in both the title and body of the motion, and a motion acknowledging receipt of the plan is passed by the council. The intent of the plan is to divert flows from the landfill through recycling and by developing new uses to increase local demand.

In the development of the plan, the solid waste division shall consult with the following county divisions on potential options: road services; permitting; wastewater treatment; water and land resources; and parks and recreation.

The plan shall include, but not be limited to:

A. An evaluation of actions the county can take to expand and enhance the regional market for compost that is produced using the county's organics stream. The evaluation shall consider, but not be limited to:

1. Best practices and actions taken by cities and counties across the nation;
2. County procurement policies;
3. Use in water quality, habitat and site rehabilitation projects;
4. Use in county or private development projects; and
5. Subsidies for agricultural or other uses.

B. A set of recommendations that the county could pilot to use compost produced from the county's organics stream, cost estimates for those recommendations, any barriers to the use of the compost and options to overcome those barriers.

The executive should file the plan and a motion required by this proviso by August 16, 2019, in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff and the lead staff for the committee of the whole, or its successor.

⁶ Biofiltration: is a technology that uses compost, wood chips and living organisms to capture and biologically degrade landfill methane.

Introduction

Background:

It is King County's goal to achieve zero waste of resources by 2030. This goal is contained in King County Code 10.14.020⁷, the Strategic Climate Action Plan⁸, and 2019 Comprehensive Solid Waste Management Plan⁹. Recovering organic material is an essential part of reaching this goal.

The SWD works to divert organic material - food waste, yard waste, wood waste, and soiled paper - from the Cedar Hills Regional Landfill through a variety of programs including food waste prevention, edible food recovery, and organics recycling. Businesses, institutions and residents in King County generate these materials.

When processed into a soil amendment¹⁰ (compost), these materials provide a significant benefit to the environment. Compost improves soil health, which along with healthy air and water is vital to ecosystem survival. Methane gas, a potent greenhouse gas is generated as these materials degrade¹¹. Recycling these materials helps mitigate this impact. Compost is beneficial for many uses including agriculture, erosion control, stormwater management and land restoration.

In 2018, organic materials comprised more than 35 percent of what was disposed at Cedar Hills Landfill. This represents a significant wasted resource, as this organic material could be utilized to improve water quality and soil plant health, and reduce climate impacts. King County relies on the private sector to collect and process organic materials. In 2018, Seattle-King County and Snohomish County public health agencies permitted capacity for organics processing was at 85 percent¹². In order to reach King County's zero waste of resources and climate goals, more capacity will be needed in the future.

The current market demand (by government agencies, landscapers, homeowners and others) for compost synchronizes with supply of material produced, however to recycle more material, additional markets are needed to incentivize additional composting (or other organics technology) processing capacity. At the same time, contamination of the organics stream in the form of plastic and glass disposed of at the curb in recycling containers by residents and business is a barrier to high quality compost. High quality

⁷ [King County Code 10.04.](#)

⁸ [King County Strategic Climate Action Plan.](#)

⁹ [King County Comprehensive Solid Waste Management Plan.](#)

¹⁰ Soil amendments are materials which are added and worked into the soil to enhance physical properties, such as the soils ability to hold water, and to enhance overall plant health.

¹¹ [King County Strategic Climate Action Plan-Greenhouse Emissions.](#)

¹² An infographic setting out the regional organic system can be found in the addendum to this plan.

compost is critical for markets to be strong, sustained and to expand.

As required by the Proviso, SWD consulted on potential options with the Department of Local Services Roads and Permitting Division, and the DNRP divisions of Wastewater Treatment, Water and Land Resources, and Parks and Recreation.

This Organics Plan is organized as follows:

Part A: Is an evaluation of actions the county can take to expand and enhance the regional market for compost that is produced using the county's organics stream. As required, the evaluation considers:

1. Best practices and actions taken by cities and counties across the nation;
2. County procurement policies;
3. Use of compost in water quality, habitat and site rehabilitation projects;
4. Use of compost in county or private development projects; and
5. Subsidies for agricultural or other uses.

Part B: Includes recommendations that the county could pilot to use compost produced from the county's organics stream, associated cost estimates for the recommendations, identification of barriers to the use of the compost and options to overcome those barriers.

Part A: Evaluation

Plan Development:

To develop this Organics Plan, SWD contracted with Cascadia Consulting Group for market assessment research¹³ and hosted two facilitated full-day organics summits¹⁴ in March and April 2019. Over 50 regional stakeholders from, tribes, cities, composters, waste haulers, landscapers, universities, regulators, nongovernmental organizations, and King County government, gathered at the Tukwila Community Center to provide input on barriers, challenges, and opportunities in organics recycling.

Together, organics summit participants drafted a vision statement to guide the work on compost and organic material management – *“Organic material is prevented, reduced, recycled and ultimately reused locally, creating a self-sustaining regional organics system that minimizes waste, promotes healthier soils and protects the environment.”*

In addition to research and public involvement, SWD consulted on potential options with county departments and divisions as required including:

- Department of Natural Resources and Parks: Parks and Recreation Division; Wastewater Treatment Division; Water and Land Resources Division
- Department of Executive Services: Procurement and Payables Section

¹³ [King County 2019 Organic Materials Management.](#)

¹⁴ [Organics Summits.](#)

- Department of Local Services: Road Services Division and Permitting Division

1. **Best practices and actions to expand and enhance the regional market for compost taken by cities and counties across the nation**

Many jurisdictions have implemented best practices and actions that have driven increase in compost demand. The following sources of best practices were reviewed for this Organics Plan, with further references within this document as relevant. Further information on these can be found in the Organics Materials Management Report, Appendix 3¹⁵.

- **The Washington State Department of Transportation (WSDOT)** has developed extensive guidance and specifications for compost use in transportation projects.
- **The Compost Outreach Project** is an initiative of the Washington State University Cooperative Extension in Snohomish County works with local compost producers, conservation districts, and counties to promote compost use from commercial food and yard waste on farms in King and Snohomish Counties.
- **Marin Carbon Project** is a consortium of agricultural groups working to increase carbon sequestration¹⁶ in soils in Marin County, California through research, advocacy, and support of carbon farming demonstration projects.
- **California Healthy Soils Program** is a collaboration of state agencies and departments to promote the development of healthy soils on California's farmlands and ranchlands.
- **The Washington State Department of Ecology** produced the Stormwater Management Manual for Western Washington includes guidelines for compost as part of bioretention soil mix to improve soil quality and organic matter.
- **Built Green** is a local green building program of the Master Builders Association of King and Snohomish Counties, calls out compost use specifically in its certification checklists for both single and multifamily homes, requiring that projects amend disturbed soil with compost to restore soil environmental functions.
- **Clean Washington Center and City of Everett (WA)** partnered on a demonstration project to assess compost use for wetland restoration.
- **New York City Parks Department** leads on compost use in parks and community gardens.
- **City of Phoenix** is currently working with Arizona State University to study compost application on multiuse turf in nine parks.
- **California Department of Food and Agriculture** administers the **Healthy Soils Program**, a multi-agency collaboration to promote soil health on the state's farm and ranchlands.
- **New York City Department of Sanitation (DSNY)** hosts multiple compost giveback events to residents.
- **Colorado state environmental purchasing policy** gives preference to compost produced by Colorado-generated plant debris and/or food and agricultural waste.

¹⁵ [King County 2019 Organic Materials Management.](#)

¹⁶ Carbon sequestration is the process of capturing and storing carbon dioxide from the atmosphere.

2. County procurement policies

King County's Department of Executive Services Procurement and Payables Section,¹⁷ helps King County departments and agencies achieve sustainability through responsible stewardship of county resources, streamlining business processes, and strategic procurements. Its Sustainable Purchasing Program (SPP), and corresponding Sustainable Purchasing policies and County Code 18.20¹⁸, support county purchasing options and educate agencies about the importance of balancing environmental, social and fiscal concerns when choosing products, materials and services.

SWD and SPP staff reviewed the current approach for procuring compost in county projects. An analysis of King County's capital projects identified missed opportunities to include compost specifications in the bid language for some projects. When compost was specified, there was a lack of uniformity in material specifications, monitoring, tracking, and costs. Thus, a county-wide systematic approach for using organics in county projects is needed. This would include educating project managers and business units on the availability and acceptable use of organics in county projects, and stimulating the demand for the use of organics in county projects. To increase compost use regionally, these resources and lessons learned would then be shared with local jurisdictions within King County.

The lack of uniform material specifications for compost, coupled with limited awareness of opportunities within projects for compost use, hampers wider use of compost by county agencies and also by local jurisdictions. Opportunities exist for increased compost use in public projects through contracting processes, coupled with targeted marketing. Where possible and appropriate, procurements could incorporate specifications for locally produced compost, derived from waste material generated by King County residents and businesses. Increasing the use of compost in public projects provides an opportunity to lead by example and demonstrate "circular" management of the region's organic waste¹⁹. Aggregating quantities of compost through a county-wide contract and having standard material specifications provides product consistency, and also has the potential to reduce procurement and product costs for all agencies.

King County government undertakes a wide range of projects where use of more compost and other finished organic materials could benefit local soils and communities.

3. Compost use in water quality, habitat and site rehabilitation projects

There are common applications for compost employed by many agencies across the country including green stormwater infrastructure projects such as rain gardens,

¹⁷ [King County Procurement](#).

¹⁸ [King County Code 18.20](#).

¹⁹ A [circular economy](#) involves designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

bioswales²⁰, and green roofs. Habitat and restoration projects use compost to conserve water where soils are damaged, support revegetation and growth of cover plants, and improve soil fertility. For example:

Green stormwater: The King County Wastewater Treatment Division works with Seattle Public Utilities and partners with the Rainwise program²¹ to implement green stormwater infrastructure (GSI) as called for by local and state requirements²² and environmental objectives²³.

Tree health: A study of urban forests in New York City found that compost application increased water-holding capacity and microbial biomass of soil immediately and increased tree growth²⁴.

Water conservation: The City of Redmond's soil amendment guidelines indicate amending a turf site with compost can reduce peak summer irrigation by 60 percent compared to unamended sites²⁵.

Site restoration: A U.S. Forest Service study in 1996 found that seedlings planted on compacted, eroded, and steep slopes grew taller and to wider diameters after 20 months when planted on test plots with compost compared to those planted with straw mulch²⁶.

Soil amendments: King County Code 16.82 requires construction projects within King County to develop a soil management plan and document the amount of compost or compost-containing topsoil mix used²⁷.

Carbon sequestration and storage in soil applications: There is significant emerging research and public policy exploration of the carbon benefits of healthy soils. The California Healthy Soils Program is a multi-agency collaboration to promote soil health on the state's farm and rangelands to improve soil health while reducing greenhouse gas emissions²⁸.

4. Compost use in County or private development projects

Seasonality and construction project timelines continue to be factors affecting market demand for organics. For example, WSDOT's use of compost varies with new project funding since compost uses are tied to some but not all of their construction activities – which vary in size and the extent to which soil amendments are required, including

²⁰ Bioswales slow stormwater runoff and directs it to an area where it can soak into the soil.

²¹ The [RainWise program](#) helps private property owners manage the rain that falls on their roofs by providing rebates to cover the cost of particular building improvements like rain gardens.

²² Requirements vary depending on location, but generally aim to reduce runoff from building development and promote stormwater reuse. For example, Seattle [Municipal Code \(SMC\) 22.800-22.808](#).

²³ [King County 2019 Organic Materials Management](#).

²⁴ Cornell Waste Management Institute, *Compost Use for Improved Soil*, Ithaca: Cornell University.

²⁵ [King County 2019 Organic Materials Management](#).

²⁶ Ibid.

²⁷ [King County Post Construction Soil Standard](#).

²⁸ [California Department of Food and Agriculture Healthy Soils Program](#).

compost. Analysis finds that total annual compost use by WSDOT, as tracked by the quantities specified in bid awards, have ranged from 35,000 to 105,000 cubic yards per year (a threefold difference) over the last 10 years, demonstrating the yearly fluctuations in demand for compost.

Stakeholders at the organics summit in April 2019 noted potential for more routine applications of compost or other soil amendments for parks, city landscaping, and on roadsides, but these are not standard practices and/or do not represent significant quantities of compost at this time.

The King County Department of Local Services Road Services Division reports that critical safety work remains the top priority for 2019-2020 biennium. The Road Services Division's six-year capital improvement program is significantly diminished from past years and is focused on roads projects addressing deterioration rather than planned preservation and maintenance²⁹. With insufficient funds for a full preservation program or timely replacement of infrastructure, available revenues are focused on reacting to the higher risks associated with the deteriorating road system. King County continues to experience a roads funding crisis, due to municipal annexations, the 2008 recession, declines in gas tax revenues, the effects of voter initiatives, and an aging bridge and road system. The lack of revenue is significantly impacting the county's ability to maintain and improve roads. It has been more than a decade since a new capacity project has been funded, and preservation projects have been limited or associated with one-time funding.

Rather than importing soils, when feasible, the Roads Services Division strives to keep native soils on its project sites. Roads Services Division's capital projects are typically successful in reusing the onsite soil materials generated from the site, in compliance with the King County Green Building Ordinance³⁰. As such, Roads Services Division's projects typically use less purchased compost and soil materials, reducing overall project costs. It is anticipated that recent rates associated with Roads Services Division's compost procurement, in capital projects, will remain stable through the King County Council adopted Roads 2019-2024 six-year CIP³¹.

5. Subsidies for agricultural or other uses

Subsidies to the agricultural sector can help to reduce the cost of doing business and increase use of organics. Government programs that benefit the public interest and support farms take a number of forms, including financial support (such as grants), or providing goods or services at below market prices (such as favorable procurement processes)³².

In examining the case for subsidies for the compost market, understanding current and future markets and opportunities, identifying producer and consumer barriers, and

²⁹ [King County Roads Services Division Capital Improvement Program Transportation Projects 2017-2022.](#)

³⁰ [King County Green Building Ordinance.](#)

³¹ [King County Roads Services Division Capital Improvement Program Transportation Projects 2017-2022.](#)

³² [World Trade Organization: World Trade Report.](#)

recognizing the current support already provided by ratepayers will be essential parts of considering any future support.

Agricultural applications:

The Compost Outreach Project³³ – an initiative by the Washington State University Cooperative Extension in Snohomish County – has collaborated with local compost producers, county offices and local conservation districts since 2011 to promote and evaluate use of commercial food scraps and yard trimmings compost on farms in Snohomish and northern King County through compost use trials. Agricultural markets made up less than five percent of the total compost market in Washington State and found that 81 percent of farmers surveyed had not previously used compost made from food scraps and yard trimmings³⁴.

In addition to identifying the opportunity for compost use in agriculture, the project also noted that farmers have pinpointed compost price, spreading (equipment and time required), compost delivery, plastic contamination of compost, and lack of information about how to use compost as barriers for further compost use. Similar barriers were identified for agricultural use of compost in California during a one-day workshop organized in early 2018 by BioCycle³⁵.

High costs of transporting compost produced in western Washington for applications in central and eastern Washington makes compost less competitive than locally made compost in those areas. Interviewees for the 2019 Organics Market Assessment contained in the Organics Materials Management in King County report³⁶ and regional organics summit attendees identified the costs and associated marketing challenges for applications that require long-distance transport of compost³⁷. Participants at the organics summit noted higher opportunity for potential compost use on King County farmlands rather than focusing on the agriculture in eastern Washington.

As outlined above, development of support programs for agriculture which would provide direct financial support (such as a grant) or an in-kind support (such as below market price for compost) will need to address the identified barriers which currently prevent wider agricultural use of compost. These barriers include market price for compost and transport costs, spreading (equipment and time required), compost delivery, plastic contamination of compost, and lack of information about how to use compost.

Building on previous King County supported research³⁸, an opportunity exists for King County to explore greater support for agricultural uses of organics, particularly working with farmers from immigrant and refugee communities and for farmers supplying the

³³ [Washington State University Extension Snohomish County Compost in Agriculture.](#)

³⁴ Doug Collins, Hallie Harness and Andy Bary, WSU. "Commercial Compost Application on Western Washington Farms." July 8, 2016.

³⁵ [King County 2019 Organic Materials Management.](#)

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid.

local horticulture markets. Immigrant and refugee farmers lease land and are less able to invest in improvements, given the shorter duration of their stewardship. Translation of materials into several of the primary languages of these farmers would be necessary to increase their interest in compost use.

Part B: Recommendations

Informed by the organics summits held in March and April of 2019, the Organics Plan organizes issues facing the region into three categories of needed outcomes:

1. Enhance and expand the local market for compost – target recommendations to increase the purchase of compost in the region;
2. Reduce contamination and materials which are currently disposed which could be recycled also referred to as wasted resources – creates a focused strategy aimed at reducing contaminants in the organics waste stream and diverting more material from disposal and;
3. Expand organic material processing – identifies opportunities that could lead to additional regional organics processing.

Each recommendation outlined below includes the following information

- Description
- Basis
- Why action is needed
- Barriers/challenges
- Expected outcomes/impacts/improvements of implementation
- Duration
- Projected costs and what the funds do
- Partners involved with implementation

Each recommendation aligns with DNRP's goals and policies to achieve zero waste of resources in 2030 and divert organic materials for a more beneficial use than disposal including improved soil and plant health, enhanced water quality and climate mitigation. Actions that lead to reduced contamination recycled in organics bins and/or expansion of compost use, will help strengthen the organics recycling infrastructure.

Recommendation Area 1: Enhance and Expand the Local Market for Compost

King County government implements a wide range of projects where use of more compost and other finished organic materials could benefit local soils and communities.

Recommendation 1-A: Provide technical assistance to King County agencies to increase compost use in county projects

- **Description** – This technical assistance program will help project managers determine how to optimize the use and purchase of compost. The SWD and the SPP will develop this as a pilot project for King County government departments and divisions. The pilot includes specifications for the compost and its

applications, simplified contract arrangements, and internal education and marketing.

- **Basis** – The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because a successful pilot could provide a blueprint for more activities in the future, including direct technical assistance to local jurisdictions that could potentially better utilize and purchase compost.
- **Why action is needed** – As outlined in Part A, and in the Organics Materials Management in King County report³⁹, aggregating quantities of compost through a county-wide contract and having standard material specifications provides product consistency, and also have the potential to reduce procurement and product costs for all agencies.
- **Barriers/challenges** – Limited knowledge about the product and/or previous performance issues could limit the likelihood of compost being included in county projects. To overcome these issues, this technical assistance pilot will conduct a stakeholder segment analysis to prioritize activities, such as education on beneficial use and environmental impacts or updated compost specifications, on projects most likely to use significant amounts of compost.
- **Expected outcomes/impacts/improvements of implementation** – The pilot project is expected to increase use of compost in county projects. After successful county implementation, a similar program could potentially be offered to cities and other local jurisdictions.
- **Duration** – Launching in the third quarter of 2019, the technical assistance program will last until the end of 2020, with the possibility of further extension based on performance.
- **Projected costs and what the funds do** – from the 2019/2020 SWD adopted budget an 18-month SPP term limited temporary position has been funded, which will support county organics initiatives. Additional project costs may include technical consultant work and development of marketing materials.
- **Partners involved with implementation** – SWD, SPP, department and agencies that may procure compost for county projects, such as the Parks and Recreation Division, Road Services Division, and Water and Land Resources Division.

Recommendation 1-B: Use compost for closed landfill cover biofiltration enhancement pilot project

- **Description** – Understanding greenhouse gas emissions from stored organic carbon within landfills is an increasingly important area in landfill gas⁴⁰ management. SWD recommends piloting the use of biofiltration technology on one acre to test alternatives of compost and wood mixtures as a cover for the

³⁹ [King County 2019 Organic Materials Management](#)

⁴⁰ Landfill gas – a gas produced during the breakdown of materials in a landfill.

closed landfill facilities. Biofiltration is a technology that uses compost and wood chips and living organisms to capture and biologically degrade landfill methane. This recommendation includes piloting with biofiltration systems such as bioberms⁴¹/biocanisters⁴² to further enhance reduction of greenhouse gas emissions from closed landfills⁴³.

- **Basis** – The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because greater compost use in the region supports a robust organics recycling infrastructure and helps reduce greenhouse gas emissions. The project also aligns with the SWD’s carbon neutral efforts⁴⁴, because if the pilot provides evidence of greenhouse gas reduction at the closed landfill, there is opportunity for expanded compost use over closed landfill covers that could be explored.
- **Why action is needed** – Greenhouse gas concentrations in landfill gas diminishes in closed landfills as the refuse ages and decomposes. The landfill gas treatment system used during the active phases are typically no longer needed after landfills are closed. SWD has the opportunity to apply an additional polishing step that utilizes biofiltration materials to support further reduction of greenhouse gases.
- **Barriers/challenges** – The potential for secondary environmental impacts from compost use on closed landfills could be a potential unanticipated consequence of this project. The pilot will monitor this issue by evaluating a 1-acre plot to determine such environmental impacts. The project will need staffing, consultant services, and construction resources to implement. The SWD has collaborated on similar projects at Cedar Falls Closed Landfill with Public Health – Seattle and King County and does not anticipate any regulatory barriers.
- **Expected outcomes/impacts/improvements of implementation** – The pilot project will evaluate the effectiveness of compost biofiltration to reduce landfill gas emission through landfill covers at closed landfills. Once evaluated and analyzed, results will determine whether and what potential environmental impacts occur, the reduction rate in metric tons of greenhouse gases, and plausibility of application on larger landfill covers at any of the King County landfill facilities.
- **Duration** – The biofiltration project anticipated to launch by the end of 2019 (biofiltration cover pilot is subject to a further budget ordinance but could start as soon as Q1 2020) with review and determination for continuation of the project from 2021 to 2024. Depending on pilot results, the project could be amended as described above.
- **Projected costs and what the funds do** – from the 2019/2020 adopted SWD budget, \$110,000 is the estimated cost to cover funding for the Landfill Gas Collection System Biofiltration Treatment using the bioberm and biocanisters

⁴¹ Bioberms are large half dome of compost and wood chips in which landfill gas is vented through.

⁴² Biocannisters are 55 gallon drums containing compost and wood chip material in which landfill gas is vented through.

⁴³ Closed landfills are landfills that are no longer accepting or placing solid waste.

⁴⁴ SWD role in [DNRP Beyond Carbon Neutral](#) commitment

technologies. A future budget request for an additional project is needed for the SWD Closed Landfill Cover Biofiltration Pilot (\$560,000). This request will be submitted in a subsequent supplemental budget ordinance transmitted to Council mid-September. The budget is composed of contractual consultant and contractor fees and staff labor.

- **Partners involved with implementation** – Public Health – Seattle and King County; consultants, contractors and composters.

Recommendation 1-C: Increase compost use on King County owned farmland pilot

- **Description** – Farmland is a precious and disappearing resource. The U.S. Department of Agriculture’s Census reports a loss of two million acres of farmland in Washington State, from 1982 to 2012⁴⁵. King County owned farmland supports minority communities including immigrant, refugee, and communities of color by providing access to land and enabling participation within the agricultural market place⁴⁶. The pilot will provide compost to improve soils on King County farmlands.
- **Basis** – The project aligns with the King County Comprehensive Growth Plan⁴⁷, Strategic Climate Action Plan⁴⁸, and Equity and Social Justice Strategic Plan⁴⁹. The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because greater compost use in the region supports a robust organics recycling infrastructure and helps reduce greenhouse gas emissions. The project also aligns with the County’s equity and social justice work efforts, because the pilot project will be working with farmers drawn from several communities who might otherwise be excluded from using compost.
- **Why action is needed** – This pilot would address several issues at the same time, including enhancing farmland soils, supporting immigrant and refugee communities in expanding their awareness and use of organics, and enhancing land stewardship.
- **Barriers/challenges** – Barriers to using compost on these farms include farmer awareness and access to compost equipment and compost quality concerns. The pilot project will address these issues by developing the project in partnership with communities and subject matter experts.
- **Expected outcomes/impacts/improvements of implementation:** The pilot project will explore and produce data on the impact of increasing access to compost and compost application equipment, and education and information that will maximize the benefit of compost use for participants. Once evaluated and analyzed, the project should provide insight into designing compost programs for

⁴⁵ [Washington State Recreation and Conservation Office.](#)

⁴⁶ [King County Agriculture Program.](#)

⁴⁷ [King County Comprehensive Growth Plan.](#)

⁴⁸ [Strategic Climate Action Plan.](#)

⁴⁹ [Equity and Social Justice Strategic Plan.](#)

a range of different farming communities, including communities where a language other than English is the primary language. If the pilot shows increased production and financial benefits, other farmers would be interested in the results and in exploring compost application on their farms.

- **Duration** – Planning and development is underway with implementation to begin in spring of 2020. Depending on the results, the program is extendable.
- **Projected costs and what the funds do** – from the 2019/2020 SWD adopted budget, \$30,000 to cover cost of compost, equipment hire, relevant marketing and facilitation needed to engage communities for 2-3 farms.
- **Partners involved with implementation** – SWD, Water and Land Resources Division, Office of Equity and Social Justice, King Conservation District, King County Agriculture Commission, farming partners, Immigrant and Refugee Commission.

Recommendation 1-D: Soil restoration at Parks and Recreation Division post demolition sites

- **Description** – Being outdoors is a way of life for King County citizens. It helps to de-stress, brings peace of mind, and makes healthier and more livable neighborhoods – benefits that are ever more important as cities grow and densify. The County acquires natural lands often with structures in need of demolition before returning to a natural state. The soil on the building footprint at these sites is often in very poor quality. Compost could be beneficial for helping to strengthen the natural environment, supporting trees and plant life.
- **Basis** – The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because greater compost use in the region supports a robust organics recycling infrastructure and helps reduce greenhouse gas emissions. The project aligns with the King County Land Conservation Initiative because by using compost to aid green space recovery, accelerating when these green spaces can be enjoyed by all citizens.
- **Why action is needed** – The soil from sites with newly demolished structures is often of poor quality making it more difficult for plants to grow. Using compost on degraded or damaged lands supports tree and plant life on newly restored land. Increasing the number of projects using compost will increase local demand.
- **Barriers/challenges** – Barriers to using compost on these sites include site proximity to wetlands which could require additional permitting; and resources to plan, use and monitor compost use. Consequently, appropriate grading permits need to be secured. The project will address the issue by working with the technical assistance program and using subject matter expert involvement.
- **Expected outcomes/impacts/improvements of implementation** – Improved tree and plant growth through enriched soil quality.
- **Duration** – Planning and development is underway. The program is expected to begin working on sites in early 2020. Depending on the results, the program is

extendable.

- **Projected costs and what the funds do** – from the 2019/2020 SWD adopted budget, \$1,000 to \$5,000 per site to cover compost material, delivery and application.
- **Partners involved with implementation** – SWD and the Parks and Recreation Division.

Recommendation 1-E: Explore incentives for compost use in King County’s green building practices

- **Description** – The King County Sustainable Infrastructure Scorecard rating system integrates green building and sustainability practices in County-owned capital projects by awarding points for sustainable strategies, and is a key tool for county projects complying with the King County Green Building and sustainable development ordinance. Currently compost use in King County buildings is not incentivized but could be in the future. This pilot will establish the case that using compost in green buildings projects is worthwhile and identify any initial projects to test the new approach⁵⁰.
- **Basis** – The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because greater compost use in the region supports a robust organics recycling infrastructure and helps reduce greenhouse gas emissions.
- **Why action is needed** – The Scorecard rating system includes soil amendment but does not explicitly require County projects to use compost. Exploring how the sustainable infrastructure scorecard could incentivize compost use and identifying potential pilots could be beneficial for future compost use in King County buildings.
- **Barriers/challenges** – Barriers to using compost on these projects have not been identified at this time but are expected to be similar to the broader challenges of the technical assistance program (recommendation 1A). Limited knowledge about the product and/or previous performance issues could limit the likelihood of compost being included in county projects. To overcome these issues, this technical assistance pilot will conduct a stakeholder segment analysis that focuses on the green building project managers to prioritize activities, such as education on beneficial use and environmental impacts or updated compost specifications.
- **Expected outcomes/impacts/improvements of implementation** – Sustainable Infrastructure Scorecard guidelines⁵¹ are updated and projects are incentivized to use compost.
- **Duration** – Work has already begun and is expected to be completed by mid-

⁵⁰ [King County Sustainable Scorecard](#).

⁵¹ Ibid.

2020.

- **Projected costs and what the funds do** – No additional costs; will be absorbed into current bodies of work.
- **Partners involved with implementation** – Green Building Team⁵².

Recommendation 1-F: Review post-construction soil standards for compost use and compliance

- **Description** – King County's land clearing and grading regulations for property in King County include a post-construction soil standard for site development activities in unincorporated King County (KC Code, Chapter 16.82)⁵³. In effect since January 1, 2005, the soil standard is meant to preserve and restore healthy soils to better manage stormwater and reduce stormwater runoff and its negative effects. These regulations help prevent costly environmental and landscape problems by requiring permit holders to preserve topsoil, restore soils by adding compost after construction, or implement other measures to maintain the soil's moisture holding capacity. At present, there is no system for tracking and recording compliance with KCC 16.82, so SWD is not able to identify whether projects use compost or other top soil. Additional collaboration with the Permitting Division is needed to gather data on the current level of compliance and the volume of compost used.
- **Basis** – The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because greater compost use in the region supports a robust organics recycling infrastructure and helps reduce greenhouse gas emissions.
- **Why action is needed** – Participants at the organics summits identified that no information is available on how the post-construction soil standard ordinance is working in practice. In particular, it is not known how any construction projects are using compost. The data collected from monitoring compliance of the post-construction soil standard will help inform a further evaluation of the approach. This could lead to further information, such as targeted marketing materials about compost to construction developers to help increase compost demand.
- **Barriers/challenges** – There is limited information available on how the requirements of the soil standard ordinance are applied. The process of compliance monitoring may also help to identify potential barriers to compliance, such as awareness of requirements or the role of inspectors. This could lead to new marketing and information materials or a need for an updated approach for inspectors.
- **Expected outcomes/impacts/improvements of implementation** – The project will provide data on application of the ordinance requirements and so allow a

⁵² [King County Departments](#) including Natural Resources and Parks, Transportation, Development and Environmental Services, Finance, Executive Services, and Adult and Juvenile Detention.

⁵³ [King County Code 16.82.](#)

more confident evaluation of whether there is opportunity to take further steps in the future.

- **Duration** – Project will begin in late 2019 and run throughout 2020.
- **Projected costs and what the funds do** – No additional costs; will be absorbed into current bodies of work.
- **Partners involved with implementation** – Local construction stakeholders (such as contractors who are responsible for complying with County code), SWD and the Department of Local Services Permitting Division.

Recommendation Area 2: Reducing Wasted Resources and Contamination

Maximizing diversion of wasted resources and minimizing contamination is essential to meeting King County's goals. High quality compost, free of plastic contamination, is critical for strong and sustained market demand⁵⁴. Contamination in the form of plastic and glass disposed improperly at the curb in recycling carts by residents and businesses is a barrier that must be overcome. Organics processors⁵⁵ implement a variety of technologies to remove unwanted contamination from their finished product. Educating customers on the correct placement of plastics, glass, and organics in collection carts by residents and businesses will reduce contamination. This is necessary to reduce contamination and improve the quality of the organic material delivered to the organics processor. SWD plans to continue a regional dialogue with stakeholders on a bi-annual basis to ensure continued collaboration particularly through coordinated customer education.

Recommendation 2-A: Regional contamination reduction outreach campaign

- **Description** — A social marketing development plan and regional education campaign aimed at reducing contamination in the organics collection carts. A multi-cultural approach to campaign tactics will include contamination cart tagging, enforcement, and working directly with households that are not compliant with reducing contamination.
- **Basis** – The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because reduced contamination in materials collected for composting, supports a robust organics recycling infrastructure and helps reduce greenhouse gas emissions. The campaign additionally supports the Equity and Social Justice Strategic Plan as a variety of tactics and tools will be used to reach diverse audiences all across King County.
- **Why action is needed** – Addressing confusion about acceptable organic materials for recycling across the region requires a consistent approach.

⁵⁴ [Contamination report for Washington State.](#)

⁵⁵ [Processing organic waste.](#)

Contamination in the organics cart such as plastic bags and other non-compostable materials are a continued problem for organic processors because finished compost products with even small fragments of plastic or glass hamper marketability and impact value.

- **Barriers/challenges** – Sources of contamination and consumer beliefs and behaviors driving contamination are unclear and represent barriers to progress. SWD is investigating major sources, residential beliefs and behaviors that are driving contamination.
- **Expected outcomes/impacts/improvements of implementation** – Increased residential understanding of acceptable materials in organics recycling containers leading to increased quality of organics through reduced contamination.
- **Duration** – Campaign research and development fall 2019 and campaign implementation spring 2020.
- **Projected costs and what the funds do** – from the 2019/2020 adopted SWD budget \$250,000 to cover behavior research, development of a social marketing campaign, advertising and media buys.
- **Partners involved with implementation** – SWD, cities, haulers, households, composters and consultant team.

Recommendation Area 3: Expand Regional Organic Material Processing

According to King County studies that characterize the waste stream⁵⁶, in 2018 more than 350,000 tons of organic materials (food, yard and wood waste, soiled paper) were disposed at the Cedar Hills Regional Landfill. This represents more than 35 percent of total disposal. To reach King County goals, and more sustainably manage these materials, they are better managed in the recycling system. In 2018, the Seattle-King County and Snohomish County public health agencies permitted organics facilities to process 553,000 tons. During the same time an estimated 470,000 tons were processed at these privately owned facilities, representing 85 percent of permitted capacity⁵⁷. There remains opportunity for King County to increase organics recycling rates and divert more of the organics disposed, however additional processing infrastructure will be necessary.

Recommendation 3-A: Explore commercial food waste processing to enhance wastewater gas production

- **Description** – The Wastewater Treatment Division (WTD) and SWD have an opportunity to collaborate on the management of food waste in King County by partnering on a co-digestion project. Finding innovative ways to manage food waste is an essential part of enhancing the regional organics system. A growing number of jurisdictions have begun processing food waste with municipal sewage

⁵⁶ [King County waste monitoring reports.](#)

⁵⁷ [King County 2018 waste monitoring reports.](#)

sludge through a process called co-digestion. The anaerobic digesters used for wastewater treatment are capable of treating biodegradable waste such as sewage sludge and food waste. Through the process of digestion, beneficial bacterial breakdown organic matter and harmful bacteria, producing a nutrient rich soil amendment and biogas or methane. WTD does not accept food waste because the process of managing this material is not currently feasible or efficient. However, wastewater treatment plants elsewhere including in New Jersey, New York City, Boston and Los Angeles have partnered with solid waste management facilities to feasibly and efficiently process food waste to their benefit. To achieve this, commercial food waste is screened to remove contaminants and sent through a blend tank, converting it into an organic slurry. The slurry can then be directly pumped into anaerobic digesters at wastewater treatment facilities, enhancing the digestion process and increasing gas production.

- **Basis** – This alternative to food waste management aligns with waste diversion and climate goals by diverting a renewable waste product from the Cedar Hills Regional Landfill, reducing greenhouse gas emissions, generating renewable energy and increasing carbon sequestration. By co-digesting food waste through the wastewater treatment process methane gas is converted to renewable biogas. The co-digestion process enhances the wastewater digestion process, producing a high quality biosolids product and when applied to the land, increases carbon sequestration.
- **Why action is needed** – Co-digestion⁵⁸ provides a sustainable solution for food waste management. Twenty percent of material disposed at Cedar Hills Regional Landfill is food waste. By co-digesting food waste through the wastewater treatment process, methane is captured and converted to a renewable product. This process helps preserve Cedar Hills Regional Landfill capacity, compost capacity limits, and increased limits on fossil fuel use. The biogas produced at the treatment plant is a renewable source of methane that can be converted into electricity or sold to the gas market and the food waste is converted into a nutrient rich soil amendment.
- **Barriers/challenges** –
 - Isolation of food waste material
 - Educating residents on food separation
 - Marketing – who and how?
 - Ensuring enough tonnage of food waste needed for the treatment plant process
 - Partnering with other entities
 - Costs associated with needed infrastructure
- **Expected outcomes/impacts/improvements of implementation** – WTD currently uses approximately 50 percent of the total energy consumed by King

⁵⁸ Co-digestion is a process where energy-rich organic waste materials (e.g. including food scraps) are added to dairy or wastewater to produce gas from the decomposition of the organic materials.

County government. By increasing gas production at the plant, WTD could sell or reuse a larger percent of its own gas, reducing the total energy demand by the County. Adding food waste slurry to the anaerobic digesters⁵⁹ can increase energy output by about 50 percent. The municipalities currently using co-digestion are seeing enough energy production from this process to set goals of Net Zero within the next five years. This project evaluates the feasibility of adding co-digestion to WTD, as it will require capital investments and long-term Operations and Maintenance. At a minimum, WTD will need to address digester capacity, gas capture and scrubbing capacity.

- **Duration** – Should this project prove to be feasible, co-digestion is expected to be a permanent part of the wastewater treatment process until such time that it is no longer needed or no longer the best alternative for food waste management within the region. Project implementation has not begun. The first line of action is to determine feasibility and develop a timeline.
- **Projected costs and what the funds do** – Total project costs have not been determined to-date. It is anticipated that at a minimum, project costs will include a food waste slurry receiving station, slurry pumps, pipes and meters, gas capturing and scrubbing and potential digester installations. There will be a range of cost associated with the project depending upon the location, necessary equipment installs and partners.
- **Partners involved with implementation** – WTD and SWD will work in partnership to develop this project while engaging with waste haulers to develop a public/private partnership.

Recommendation 3-B: Support regional organics processing in appropriately zoned areas

- **Description** – The Permitting Division of the Department of Local Services has undertaken a code study to review the potential for siting organics composting facilities in unincorporated King County, and will consider modifying policies or development regulations as part of the study.
- **Basis** – Per Section B (II. Area Zoning and Land Use Studies) of the Scope of Work for the 2020 Comprehensive Plan Midpoint Update (Motion 15329).
- **Why action is needed** – The County is committed to increasing organic recycling to help meet the zero waste of resources 2030 goal. As organic material generation grows with population, and more material is diverted from the landfill, the region will need additional permitted composting capacity to meet the future tonnage of organic recycling.
- **Expected outcomes/impacts/improvements of implementation** – Facilitate the siting of additional organics composting facilities.

⁵⁹ Anaerobic digestion: is the natural process in which microorganisms break down Picture of microorganisms organic materials.

- **Duration** – Report submittal to Council September 30.

Recommendation 3-C: Explore feasibility of local organics processing at the Vashon Island Recycling Transfer Station

- **Description** – SWD collects yard waste at the Transfer Station from self-haul customers, and contracts with a compost facility in Maple Valley for processing. SWD is hiring a consultant to evaluate small-scale organics management options for the Vashon/Maury Island community. The project will illustrate costs and benefits of an on-island organics processing facility by considering available organics feedstock, potential organics technologies, co-located or coordinated anaerobic digestion, potential project sites, options for ownership and operation, and expected markets for finished products.
- **Basis** – The project aligns with the King County Comprehensive Solid Waste Management Plan and the Strategic Climate Action Plan because additional capacity to process organic materials in the region supports a robust organics recycling infrastructure and helps reduce greenhouse gas emissions. Due to its distance from other King County infrastructure, serving Vashon Island is costly and has climate impacts that can be potentially reduced. The Vashon community strongly advocates for local composting, reducing organic waste export, and desires a local supplier for compost.
- **Why action is needed** – Study results are needed to inform SWD on the costs and benefits of on-island organics processing at the Vashon Island Transfer Station. The study will:
 - Provide information on current volumes, practices, and costs for handling assorted organic wastes on Vashon/Maury Islands; and
 - Develop and describe alternative on-island organics processing strategies;
- **Barriers/challenges** – The feasibility study will inform barriers/challenges of on-island processing.
- **Expected outcomes/impacts/improvements of implementation** – The study will inform next steps for implementing a chosen organics processing strategy. SWD will share recommended alternative strategies with stakeholders and solid waste advisory groups to determine next steps.
- **Duration** – A Request for Proposals (RFP) was published on July 12, 2019 and a consultant will be selected in September. The report is expected to be completed 6-9 months after contract execution.
- **Projected costs and what the funds do** – from the 2019/2020 SWD adopted budget, \$50,000 to cover procuring the study.
- **Partners involved with implementation** – SWD, Vashon community groups, and KC Department of Local Services.

Conclusion and Next Steps

The Solid Waste Division of the Department of Parks and Natural Resources works to divert organic materials (food, yard and wood waste and compostable paper) from the Cedar Hills Regional Landfill in support of the Comprehensive Solid Waste Management Plan, Strategic Climate Action Plan and Title 10. Recycling these materials into compost or other organic products improve water quality, soil and plant health, and reduces climate impacts.

High quality compost is critical for strong and sustained market demand for the material. The current market demand for compost synchronizes with supply of material produced, however to recycle more material, additional markets are needed to develop additional processing capacity. At the same time, contamination of the organics stream in the form of plastic and glass disposed of at the curb in the recycling containers by residents and business is a barrier to high quality compost.

Recycling of organic material in the region is processed by the private sector. Current Seattle-King County and Snohomish County Public Health permitted capacity is at 85 percent, meaning that in order to reach King County's zero waste of resources goal; more capacity will be needed in the future.

This Organics Plan outlines a series of recommendations King County can take with the intent to develop local demand in support of the enhancement and expansion of the organics market. A strong and vibrant compost market relies on material collected for recycling with minimal contamination and a diverse range of purchasers and users.

Fully implementing the recommendations in the Organics Plan is a work in progress. It requires ongoing collaboration from regional stakeholders and other County agencies.

All of the recommendations align with King Counties goals and policies to achieve zero waste of resources by 2030 and divert organic materials for a more beneficial use than disposal including improve water quality, soil and plant health, and reduces climate impacts. Actions that lead to reduced contamination recycled in organics containers and/or expansion of compost use will help strengthen the organics recycling infrastructure.

At this time, the only new budget authority needed is the Solid Waste Division Closed Landfill Cover Biofiltration Enhancement Pilot Project (Recommendation 1-B). This request will be submitted in a subsequent budget ordinance, expected to be transmitted to Council mid-September. No code changes are needed to implement this project.

Other recommendations that involve SWD will be paid for through the existing budget. Capital projects in the Construction Fund are paid for by bond proceeds, transfers from Operating and fund balance.

Addendum

2018 Organic Materials Management in King County



Food, yard and wood waste, and compostable paper

King County's vision is to create a self-sustaining regional organics system that minimizes waste, promotes healthier soils, and protects the environment.

