

To: Warden and Members of County Council

From: Director of Public Works

2021 Curbside Waste Audit and Organics Resource Recovery Technology Review

RECOMMENDATION

- 1. That County Council receive Report No. PW 2022-33, entitled “2021 Curbside Waste Audit and Organics Resource Recovery Technology Review”, as information.**

REPORT HIGHLIGHTS

- This report summarizes the findings from the 2021 Curbside Waste (black bag) Audit that was undertaken as an update to the 2017 baseline waste audit. The composition of residential waste found in the black bag includes approximately 60% organic material (by weight) that could potentially be diverted for resource recovery and beneficial reuse for soil amendment and/or renewable gas and electricity to offset fossil fuels and associated greenhouse gas (GHG) emissions.
- The 2021 Curbside Waste findings are being used to fundamentally inform the Organics Resource Recovery Technology (ORRT) review which was initiated by staff in 2022 in order to identify the preferred approach for a County-wide food and organic waste diversion program to meet objectives established in the Provincial Food and Organic Waste Framework.
- The County currently operates successful waste diversion programs (blue box, scrap metal, e-waste, tires, household hazardous waste, construction and demolition materials, biosolids, film plastics, bulky Styrofoam, and yard waste); however, the overall landfill diversion rate has plateaued at around 40 to 43% since 2018. The potential diversion of food and organics from the waste stream will serve to further increase landfill waste diversion.

Implementation Points

Staff will report to County Council in Q4 2022 on the draft findings of the ORRT Feasibility Study.

The 2021 curbside waste audit results will also be used to enhance public promotion and education on current waste diversion programs with greater focus on specific materials found in the residential garbage stream.

Financial Impact







There are no financial impacts as a result of this report. Any required action that will result in expenditures has been accounted for in the 2022 Operating Budget for Waste Management.

Communications

Findings from the 2021 Curbside Waste Audit and a summary of the ORRT feasibility study were presented to Zero Waste Oxford (ZWO) for discussion at the April 20, 2022 meeting.

Through the ORRT feasibility study, the Township of South-West Oxford and the City of Woodstock have been invited to participate on the project team to evaluate and comment on each project milestone. Further touchpoints with ZWO and County Council will occur throughout 2022 on the progress of the ORRT feasibility study for comment. Report No. PW 2022-33 will be circulated to area municipalities for information.

Strategic Plan (2020-2022)

					
<i>WORKS WELL TOGETHER</i>	<i>WELL CONNECTED</i>	<i>SHAPES THE FUTURE</i>	<i>INFORMS & ENGAGES</i>	<i>PERFORMS & DELIVERS</i>	<i>POSITIVE IMPACT</i>
		3.iii.	4.ii.		

DISCUSSION

Background

In 2021, AET Group Inc. (AET) was retained to complete an audit of County residential curbside garbage (black bag) as an update to the comprehensive 2017 baseline waste audit that was undertaken to support the development of the Oxford County Zero Waste Plan (Report No. [PW 2017-42](#)). The findings of the 2021 residential waste characterization audit will be utilized to inform the Organics Resource Recovery Technology (ORRT) Feasibility study identified in the 2022 Business Plan and Budget. This study is being initiated to meet the Provincial Food and Organic Waste Framework objectives.

The objectives of the Provincial framework include waste prevention/reduction (e.g. rescue of surplus food), resource recovery, support of resource recovery infrastructure and beneficial uses of recovered organic resources such as soil amendments (composting), and production of renewable natural gas and electricity to offset fossil fuels and associated greenhouse gas emissions.

The Provincial framework also includes a policy statement that identifies municipal organic waste diversion targets based on population thresholds (Report No. [PW 2020-56](#)). The policy statement identifies curbside collection of source separated food and organic waste (SSO) as the preferred method of servicing single-family dwellings, although alternatives to curbside collection programs may be used if equivalent diversion targets can be achieved efficiently and effectively.

In Oxford County, the City of Woodstock is the only municipality that meets the population threshold and, therefore, will be required to achieve a 50% diversion of food and organic waste from single-family dwellings by 2025. The policy statement, however, encourages regional approaches (i.e. County-wide) to single family residential food and organics diversion along with complementary opportunities to capture organic waste generated by the multi-residential and Industrial, Commercial and Institutional (IC&I) sectors.

In addition to the Provincial Food and Organic Waste Framework, Environment and Climate Change Canada (ECCC) is developing a federal regulatory framework to reduce methane emissions from landfills (Report No. [PW 2022-23](#)) that is anticipated to compliment and increase the effectiveness of Provincial objectives through potential landfill bans of organic waste and further support of beneficial uses of recovered organic resources.

Comments

2021 Curbside Waste (Black Bag) Characterization Audit

AET completed a curbside residential garbage (black bag) audit in Q2 2021 (refer to Attachment No. 1) utilizing a similar sampling methodology as the 2017 baseline waste audit. The garbage from representative urban and rural curbside set-outs was collected over a two-week period from 24 sample areas of ten households each (240 households) throughout the County, including sample areas in each of the eight Area Municipalities.

Curbside set-out information (e.g. participation, number of bags/containers and fullness) within each sampling area was recorded. Garbage set-outs within the sample areas were collected and sorted into different categories to determine waste characterization by the percentage of total weight. Each sample area was distinguished as either urban/village or rural depending on surrounding land use and building density.

Residential garbage composition (rural/urban combined) based on the 2021 audit results are illustrated in Figure 1.

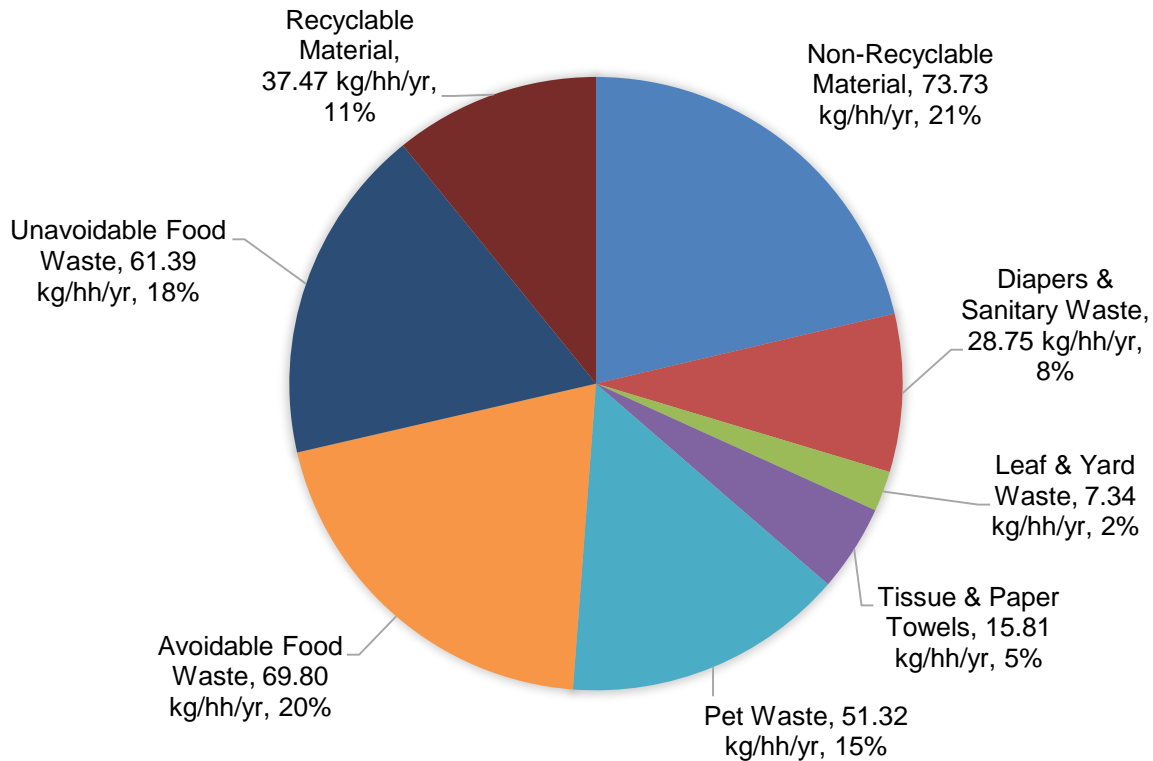


Figure 1: 2021 Rural/Urban Residential Waste Composition (kg/household/year)

Garbage composition is divided into several waste categories representing material types by the percentage of total weight that either must be landfilled, are part of current diversion programs (e.g. yard waste, recyclable material), or could be diverted through the future implementation of organics resource recovery technologies. Food and organic waste is further categorized by material types that pose different challenges and opportunities for organics waste reduction, collection and resource recovery programs.

Food and organic waste includes avoidable food waste or surplus food that would have potentially been consumable but may have spoiled, whereas, unavoidable food waste is not meant for consumption (such as peelings, bones, coffee grounds, etc.). Pet waste and diapers include organic material but could pose potential processing challenges associated with contamination from absorbent and synthetic material.

The composition of residential garbage based on the 2021 audit results was found to be generally consistent with the 2017 baseline audit. The key findings of the 2021 audit as summarized in Table 1 identified increases in the amount of garbage generated per single-family household compared to 2017. The percentage of organic material (approximately 60% by weight) found in the black bag was also higher in 2021 compared to the 2017 results.

Garbage generation per single-family household and participation in the curbside collection program is typically lower in rural areas than in urban areas. This can be attributed to agricultural operations that may utilize private waste management services and rural properties with onsite compost piles.

Table 1: Key Findings from the 2021 Waste Audit

Residential Waste - Urban/Rural Combined	2021	2017
Garbage Participation Rate Per Week ¹	50.52%	40.79%
Average Full Container Equivalents Per Household	1.42	1.46
Average Garbage Generation Rate Per Household	6.63 kg/hh/wk	5.54 kg/hh/wk
Organic Waste Component in the Black Bag (by weight)	57.40%	46.90%
Residential Waste – Urban	2021	2017
Garbage Participation Rate Per Week ¹	57.10%	42.74%
Average Full Container Equivalents Per Household	1.39	1.45
Average Garbage Generation Rate Per Household	7.63 kg/hh/wk	6.25 kg/hh/wk
Organic Waste Component in the Black Bag (by weight)	60.84%	47.88%
Residential Waste – Rural	2021	2017
Garbage Participation Rate Per Week ¹	30.83%	35.00%
Average Full Container Equivalents Per Household	1.58	1.48
Average Garbage Generation Rate Per Household	3.32 kg/hh/wk	3.07 kg/hh/wk
Organic Waste Component in the Black Bag (by weight)	49.54%	43.52%

NOTES: ¹ Garbage set out over two week sampling period

² Includes avoidable/unavoidable food waste, pet waste, tissues/paper towels

Historical Waste Quantities - Landfilled vs Diverted

The County’s ongoing waste diversion programs (e.g. blue box, scrap metal, e-waste, tires, household hazardous waste, construction and demolition materials, biosolids, film plastics, bulky Styrofoam, and yard waste) have effectively diverted material from landfilling for resource recovery and beneficial reuse. Organic waste reduction has also been promoted by the County through the implementation of backyard composters and green cone digesters, although this approach does not reduce greenhouse gas emissions associated with organics decomposition.

Historical waste quantities (landfilled vs diverted) processed at the Oxford County Waste Management Facility from 2017 to 2021 as shown in Figure 2 have seen annual increases in diverted waste tonnages that are proportional to annual increases in landfilled waste tonnages; however, the overall landfill diversion rate since 2018 has plateaued at 40 to 43%. Based on current fill rates, the remaining capacity of the County’s landfill site is estimated between 30 to 35 years.

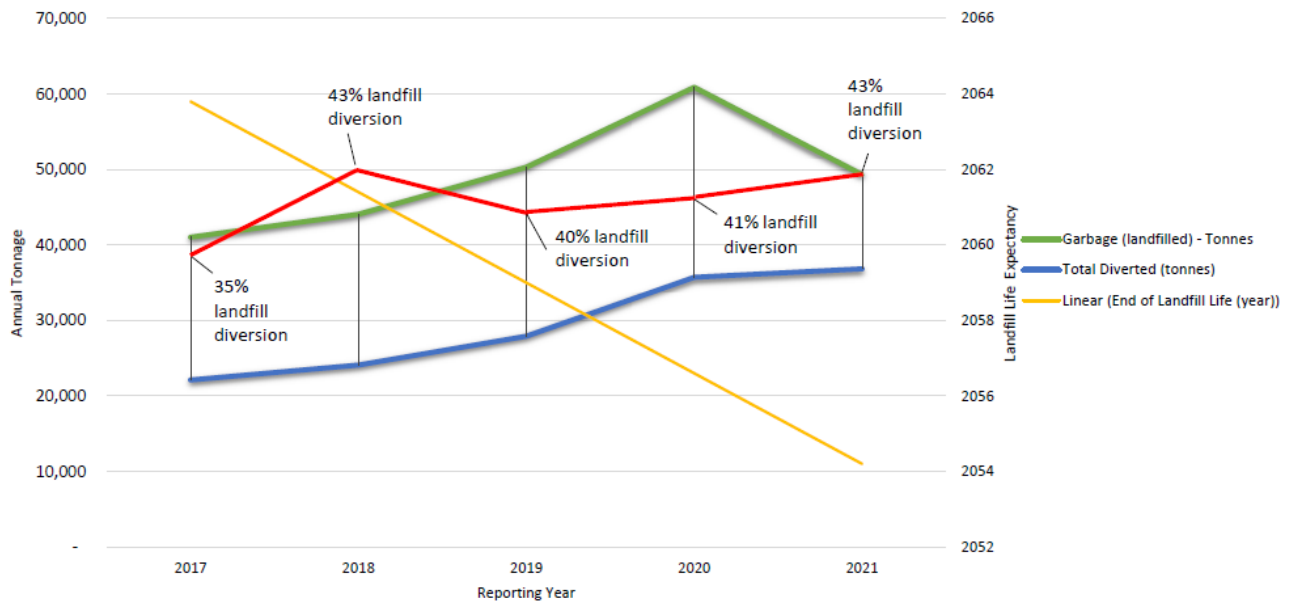


Figure 2: Historical Waste Quantities – Landfilled vs Diverted (2017 – 2021)

In the absence of waste recovery and reduction technological intervention, it will be challenging for the County to further increase landfill diversion rates. Food and organic waste diversion and resource recovery for beneficial use is an opportunity to increase diversion rates and extend the remaining capacity of the County’s landfill site. Curbside collection of organic waste has been implemented by many larger municipalities and organics resource recovery technologies are proven and have become well established locally.

ORRT Feasibility Study

An ORRT Feasibility Study undertaking was identified in the 2022 Business Plan and Budget and was recently initiated following consultant selection through a competitive Request for Proposal (RFP) process. The ORRT study objective is to evaluate and identify a preferred technology for organic waste diversion and resource recovery for beneficial use to meet the Provincial Food and Organic Framework objectives by 2025.

Staff from the City of Woodstock (Woodstock) and Township of South-West Oxford (SWOX), as County service providers for curbside waste collection, have been invited to participate with County staff as part of the Project Team for this study. The ORRT study will consider the feasibility of a County-wide approach and the operational impacts on service providers. With the expected blue box program transition to full producer responsibility by 2025 and the potential for stranded assets, there may be opportunities for Woodstock and SWOX to utilize resources (e.g. staff and equipment) for curbside collection of food and organics.

Key ORRT study tasks and associated timelines are summarized in Table 2 below.

Table 2: ORRT Study Tasks/Timelines

Project Tasks	Task Details	Target Date
Task 1	Waste Management Background Review, Waste Generation Forecast, and ORRT Legislative Review	June 2022
Task 2	Identification of Integrated Waste Diversion Technology Concepts (ORRT Scenarios)	July 2022
Task 3	Full Lifecycle Costing and Integrated Waste Diversion Technology Concepts (ORRT Scenarios)	August 2022
Task 4	Identify Preferred Integrated Waste Diversion Technology Concept(s) (ORRT Scenarios)	September 2022
Task 5	Review of Potential Funding Streams to Support the Implementation of Preferred Diversion Technology	October 2022
Task 6	Integrated Waste Diversion Technology Concepts Report	October 2022

The Zero Waste Oxford (ZWO) Committee will be afforded opportunities to provide comments and feedback at various stages of this project and staff expect to report to County Council in Q4 2022 with draft findings and recommendations.

Conclusions

The results of the 2021 curbside garbage audit demonstrate that 60% of the black bag (by weight) is composed of organic material which can be diverted from landfill and recovered for beneficial use.

The County is collaborating with its service providers to identify a County-wide preferred approach for the diversion of organic material from the waste stream. The benefits of doing so will extend the life of the County's landfill site and reduce associated greenhouse gas production which will position the County well to meet Provincial and Federal initiatives and advance forward in achieving the goals of the County's Zero Waste Plan.

SIGNATURES

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ATTACHMENT

Attachment 1: 2021 Curbside Waste Audit (July, 2021)