



# Regional Food, Organic and Biosolids Waste Processing

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# Provincial Legislation

- ▶ Ontario's Food and Organic Waste Policy Statement pursuant to Section 11 of the 2016 Resource Recovery and Circular Economy Act (collectively the Organics Provincial Policy Statement, or OPPS) requires some municipalities in Essex-Windsor to achieve specific reduction or recovery target rates by 2025
- ▶ Key Points:
  - ▶ Reduction targets shall be achieved by the prevention or reduction of food and organic waste; the safe rescue and redirection of surplus food; and the recovery of food and organic waste to develop end-products for beneficial use
  - ▶ Reduction targets cannot be achieved through the use of food and organic waste to generate alternative fuels or energy from waste without the concurrent recovery of nutrients



# Municipal Participation Requirements as per the Organics Provincial Policy Statement (OPPS)

Municipalities in Essex-Windsor are required to achieve specific reduction and recovery target rates by 2025 as follows:

- ▶ **City of Windsor** - Provide curbside collection of food and organic waste to single family dwellings in an urban settlement area and to achieve a target rate of reduction of 70%;
- ▶ **Amherstburg, LaSalle, Leamington and Tecumseh** - Provide collection (through a public drop-off depot or community composting area or through curbside collection) of food and organic waste to single family dwellings in an urban settlement area and to achieve a target rate of reduction of 50%;
- ▶ **Essex, Kingsville and Lakeshore** - Not required to achieve specific rates of reduction for food and organic waste based on their population and population densities.



# Food and Organic Waste



Food Waste



Soiled Paper



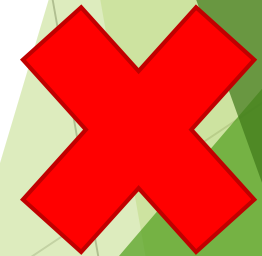
Pet Wastes



Personal Hygiene Wastes



Sanitary Wastes



Processing of Pet Waste, Personal Hygiene, and Sanitary Wastes were determined to be to problematic - would not be included as a mandatory feedstock

# Food and Organic Waste - Already Captured



Seasonal Outdoor Waste



Leaf and Yard Waste



Flowers and Houseplants

Currently included in Yard Waste Program



Compostable Products and Packaging



Paper Fibre Products

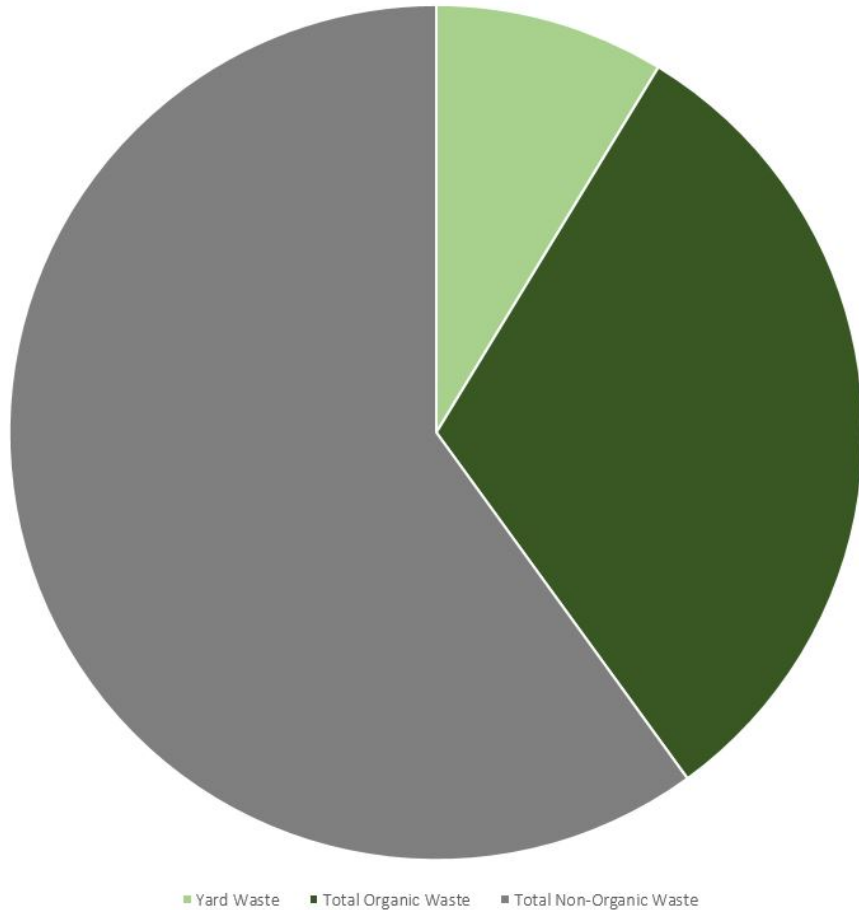


Shredded Paper

Currently included in Paper Recycling Program

# Organic Waste Production

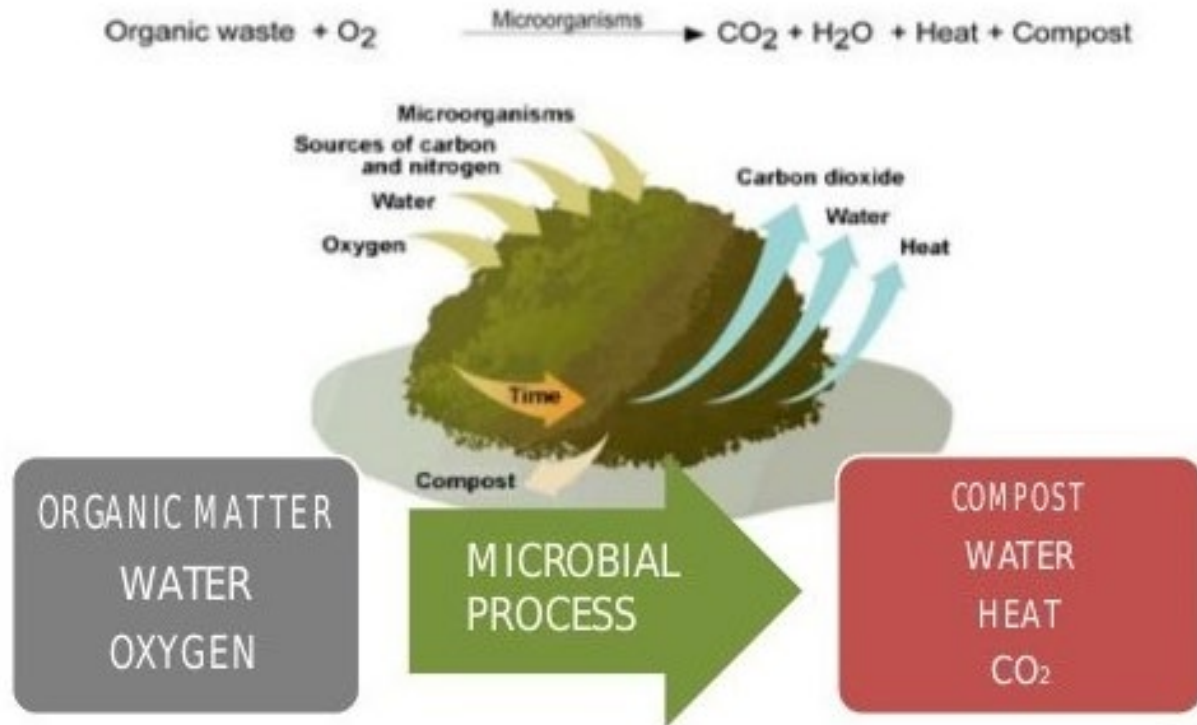
Windsor and Essex County Municipal Waste Generation



- ▶ Approximately 60% of total waste generation from our region consists of non-organic materials
- ▶ Approximately 9% of waste generated consists of yard waste, which is currently captured in the existing Yard Waste Collection Program
- ▶ Approximately 31% of waste generated consists of organic matter that is currently sent to landfills
- ▶ It is estimated that about 35,000 tonnes of residential food and organic waste was sent to landfill for disposal from Windsor and Essex County in 2020 alone

# Available Technologies - Composting

## COMPOSTING PROCESS



- ▶ Decomposition of organic matter by bacteria in an oxygen-rich (aerobic) environment
- ▶ Generates Compost, CO<sub>2</sub>, Water, Heat
- ▶ Meets the requirements of the OPPS

# Composting

## ► Benefits

- Lowest Capital and Operating Cost
- Generates a dry, stable product (compost)
- Simple, well-established process currently in use to process yard waste (i.e. small learning curve)
- Could integrate with existing leaf and yard waste program

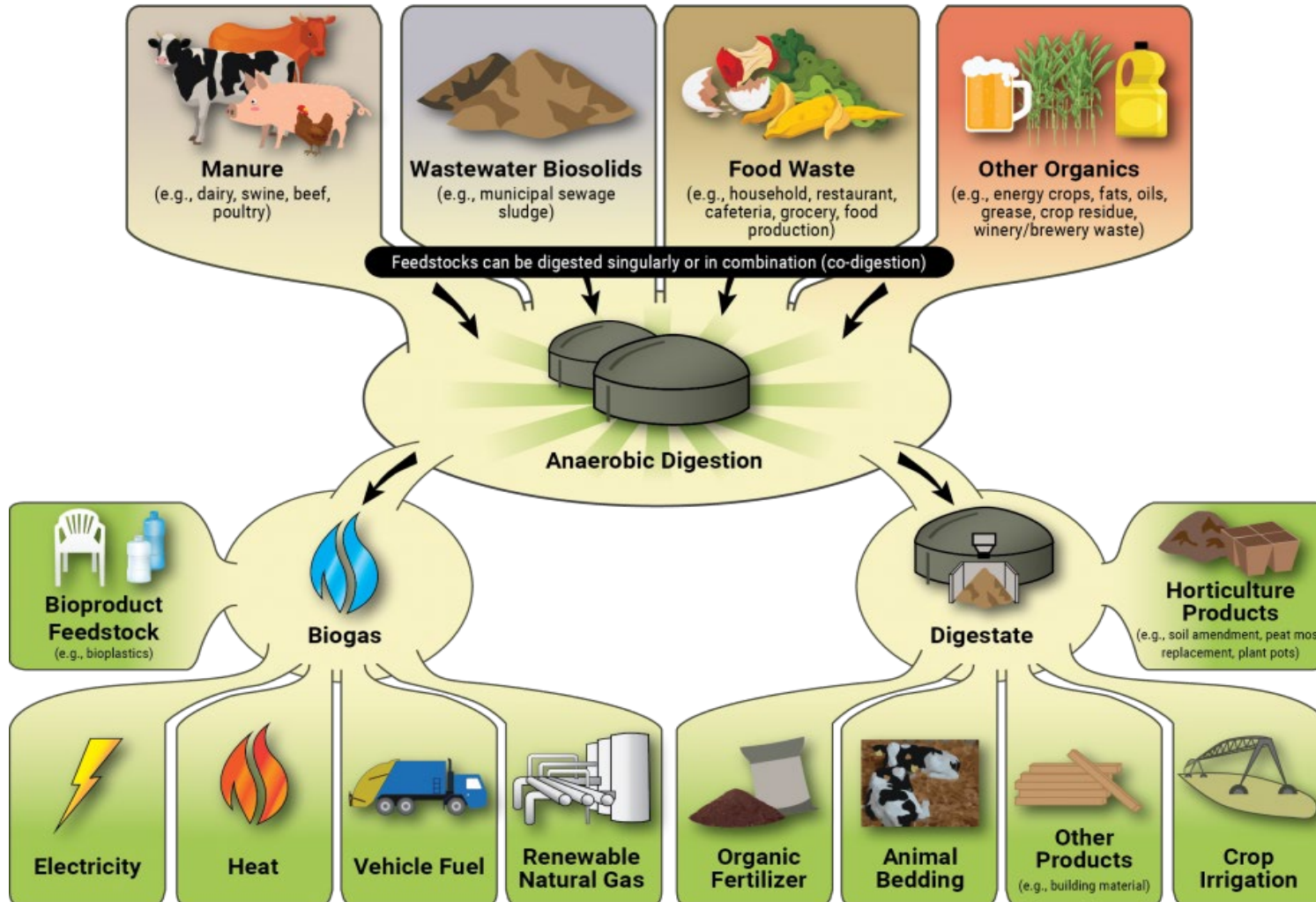
## ► Drawbacks

- Large footprint is required
- Some Greenhouse Gases (Methane, CO<sub>2</sub>, etc.) are generated during the process
- Lost opportunity to capitalize on the generation of Renewable Energy
- Other projects/solutions will need to be pursued to achieve Greenhouse Gas and Energy Reduction Targets





# Available Technologies - Anaerobic Digestion



- ▶ Decomposition of organic matter by bacteria in an oxygen-limited (anaerobic) environment
- ▶ Generates Biogas and Digestate
- ▶ Meets the requirements of the OPPS

# Anaerobic Digestion

## ▶ Benefits

- ▶ Generates biogas, which can be further processed into Renewable Natural Gas
- ▶ Generates digestate, which can be further processed into fertilizers, etc.
- ▶ Smaller footprint required than composting
- ▶ Greater volumes of Renewable Natural Gas can be realized from anaerobic digestion projects with the addition of wastewater sludge as feedstock (and displace current natural gas usage to dry sludge), or methane from the landfill gas collection system;
- ▶ OPPS encourages municipalities to plan for the management and beneficial use of biosolids

## ▶ Drawbacks

- ▶ Higher Capital and Operating Costs than composting
- ▶ Process is more complicated than composting, however it is well established in Canada

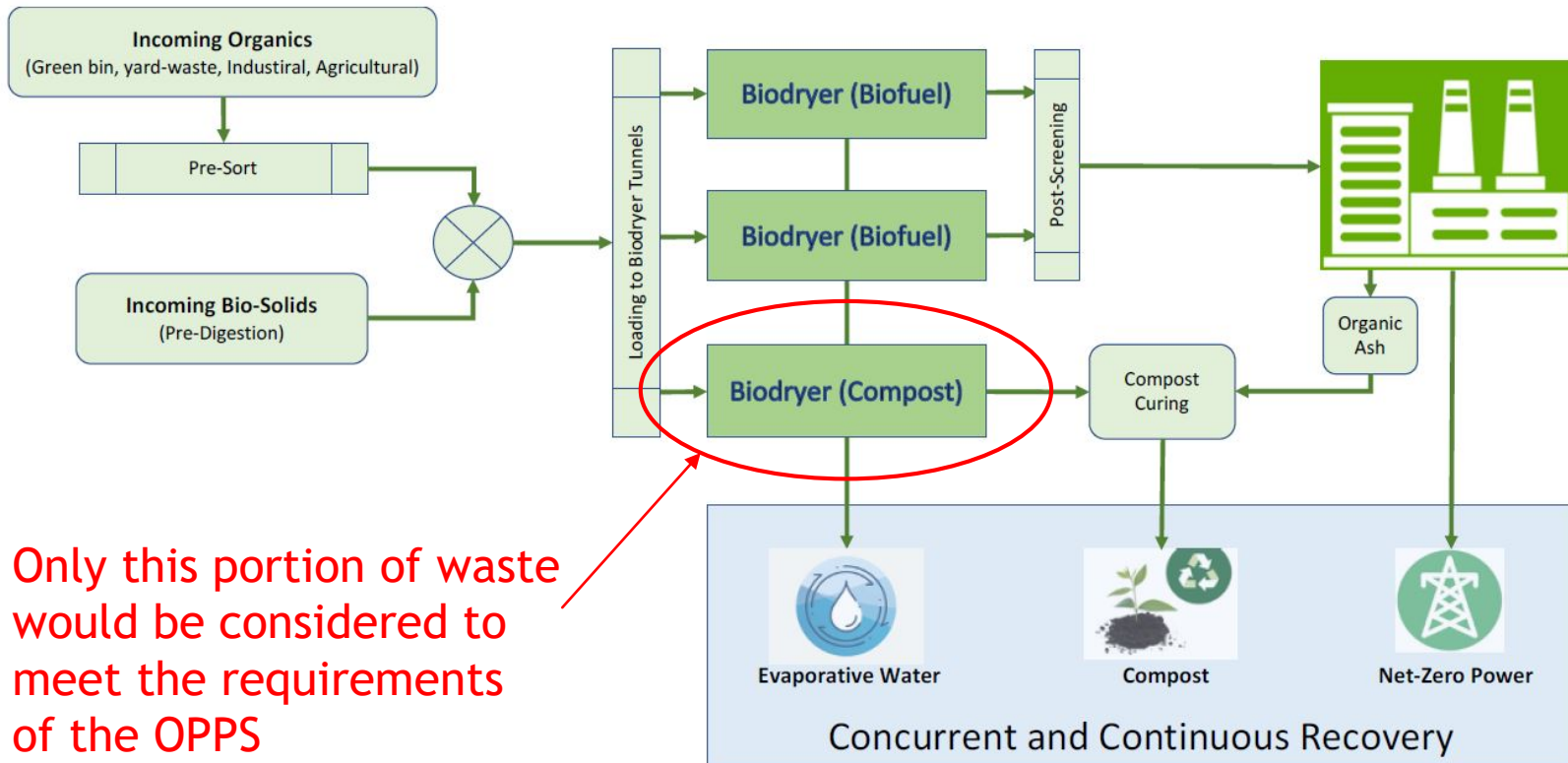
# Other Benefits to Anaerobic Digestion

## Anaerobic Digestion

- ▶ Environmental Stewardship
- ▶ Better Odour Control
- ▶ Opportunity to combine Food and Organics Waste Management Project with a Greenhouse Gas and Energy Reduction Project
- ▶ Will contribute to GHG and Energy Reduction targets to a greater degree than composting, resulting in fewer additional projects required to meet reduction targets
- ▶ May be eligible for future Federal and Provincial grants and financial incentives
- ▶ Compliments other capital projects required
  - ▶ City of Windsor WBPF - expiration of existing contract, plant expansion, and provide additional options for biosolids processing in the future
  - ▶ EWSWA Landfill - upgrades to landfill gas collection system are required



# Available Technologies - BioDryer



Only this portion of waste would be considered to meet the requirements of the OPSS

- ▶ Aerobic process, however no methane is produced
- ▶ A fraction of the feedstock is directed to a composting unit, the remaining fraction is directed to a Biofuel unit(s). Consultation with Ministry of the Environment, Conservation and Parks (MECP) representatives have indicated that *only the fraction diverted to the composting process* would be considered acceptable in accordance with the OPSS.
- ▶ Better suited for WWTP sludge and biosolids than SSO
- ▶ High maintenance and capital replacement costs

# Available Technologies - Syngas (i.e. Bradam)

- ▶ Converts organic waste into Synthesis Gas (Syngas) for production of electricity
- ▶ During the conversion of Syngas to Renewable Natural Gas, ammonia can be recovered and sold as a fertilizer product
- ▶ In theory capable of destroying PFAS, pathogenic, hormone compounds and weevils
- ▶ No known operating facilities
- ▶ Complex system, potential for odours
- ▶ High capital costs
- ▶ Consultation with MECP representatives have indicated that *this process is required to demonstrate compliance with the OPPS*. A timeline for demonstration of compliance has not been provided by the proponent.



# Fugitive Odour Prevention Principles

- ▶ Odour will be generated during any organics process
- ▶ Composting involves the addition of air into the organic mass, which generates larger quantities of air with potential odours
- ▶ AD is a contained process, with no addition of air (oxygen), therefore odours are more easily contained when the facility is constructed and operated according to best industry standards
- ▶ Municipally owned and operated AD facilities generally have very little or no odour issues (e.g. Toronto, etc.)
- ▶ Odour controls would be thoroughly evaluated during procurement to ensure the best industry standards are being applied
- ▶ Fugitive Odour Prevention Principles:
  - ▶ Minimize off-site and on-site queuing of vehicles
  - ▶ All processing and storage occurs in enclosed buildings and tanks under negative air pressure
  - ▶ Buildings are designed to prevent ingress or egress of uncontrolled air and water
  - ▶ All process and building air is collected and treated before discharge
  - ▶ Air flows through the plant from “clean” to “dirty” areas
  - ▶ Process air is not permitted to be used for building air
  - ▶ Wastes are normally processed the same day they are received
  - ▶ Fast acting overhead doors
  - ▶ All doors remain closed when not in use
  - ▶ Two layers of containment between waste process and storage areas and the outside
  - ▶ Daily monitoring for odour at property line
  - ▶ Maintain minimum air flows or air changes within buildings to ensure fresh air is being circulated

# Project Timeline

- ▶ October 6, 2020 - EWSWA Board approved development of Regional Food and Organic Waste Management Plan
- ▶ November 3, 2020 - EWSWA Board approved Oversight Committee and Working Group consisting of EWSWA, City of Windsor, and County of Essex representation
- ▶ December 1, 2020 - EWSWA Board approved consultant (GHD Limited) budget and project charter
- ▶ December 2020 - May 2021 - GHD, Oversight Committee and Working Group completed the following:
  - ▶ Worked closely with GHD to complete a Regional Food and Organic Waste Management Plan (Plan)
  - ▶ Provided EWSWA Board with regular project updates
  - ▶ Attended Regional CAO meetings on December 9, 2020 and April 30, 2021 to provide project updates
  - ▶ Held meetings with stakeholders - Essex County municipalities, Toronto, London, Chatham-Kent, Lambton, Sarnia, Association of Municipalities of Ontario, and Essex Region Conservation Authority



# Project Timeline Cont'd

- ▶ June 1, 2021 - EWSWA Board reviewed the findings of the Plan, directed EWSWA Administration to conduct a third-party review of GHD Report. Tetra Tech Canada Inc. (Tetra Tech) was retained following a competitive bidding process.
- ▶ September 15, 2021 and October 5, 2021 - Tetra Tech findings reported to EWSWA Board
  - ▶ GHD Reports are substantially sound, offer comparative impacts of various options
  - ▶ Recommend all 8 communities be part of a Regional solution
  - ▶ Recommended an open-ended RFP that requires proponents meet the following:
    - ▶ Proponent has the skill, experience and technology that works
    - ▶ Proposal meets requirements of OPPS and Regional energy reduction policies
    - ▶ Costs be evaluated on a Net Present Value basis





# Consultation with Ministry of Environment, Conservation and Parks (MECP)

- ▶ GHD, Working Group met with MECP on May 19, 2021 and May 21, 2021; Tetra Tech on August 24, 2021
- ▶ Changes to the OPPS may be forthcoming in late fall/winter 2021; however they indicated that the nature of those changes will be in relation to the types of compostable products included only. No changes to targets or deadlines are being considered.
- ▶ A Guidance Document is expected to be released when the OPPS is revised
- ▶ A new regulation currently being developed will contain language regarding a ban on organic disposal in landfills, the tentative date being considered is 2030
- ▶ Non-compliance with 2025 deadline will require municipalities to report to MECP on their OPPS status and how compliance will be achieved in short order

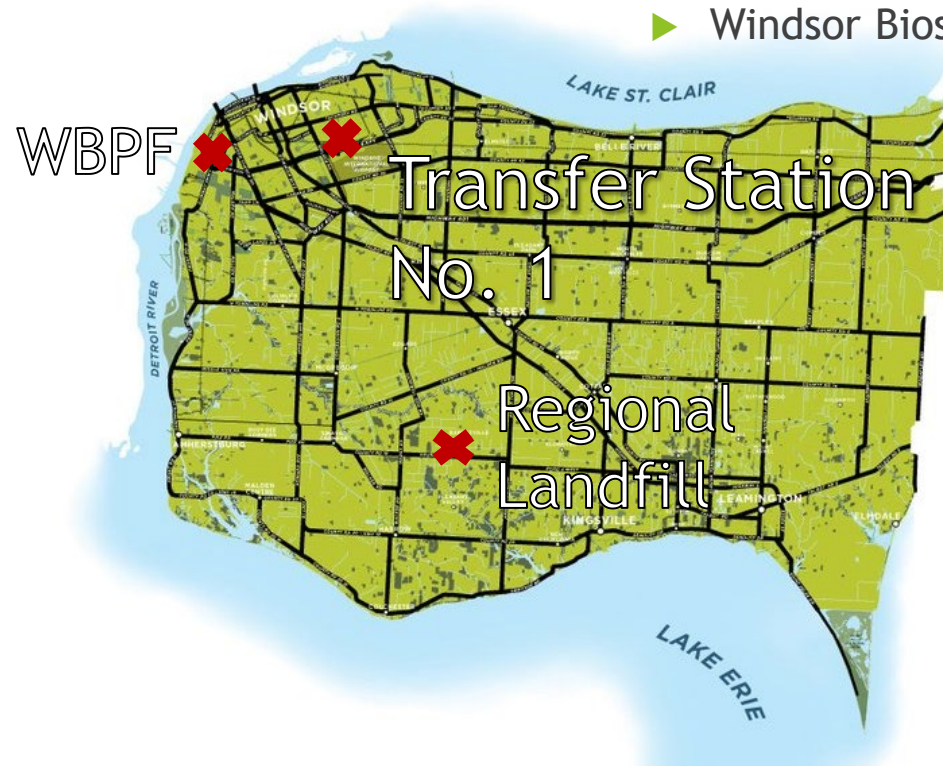
# Potential Locations

## Composting

- ▶ Requires 3.5 - 9.25 hectares
- ▶ Service Contract
- ▶ New Site (if proposed by Proponents)
- ▶ Lands Adjacent to Regional Landfill

## Anaerobic Digestion

- ▶ Requires 2.25 - 4 hectares
- ▶ Service Contract
- ▶ New Site (if proposed by Proponents)
- ▶ Lands Adjacent to Regional Landfill
- ▶ Windsor Biosolids Processing Facility



# Other Considerations

- ▶ Collection method, procedures and schedules will be evaluated at a later date
- ▶ Timeline of Processing Facility:
  - ▶ Procurement - 1.5 - 2 years
  - ▶ Design and Approvals - 1 - 1.5 years
  - ▶ Construction and Start-Up - 1.5 - 2.5 years
  - ▶ Total - 4 - 6 years
- ▶ A landfill gas utilization project would be of significant Greenhouse Gas reduction and financial benefit to EWSWA regardless of the presence of an anaerobic digestion facility, but co-locating them would streamline permitting and pipeline construction
- ▶ The anaerobic digestion options would provide more local economic stimulus over the project life - creating jobs and bringing in outside fees
- ▶ Anaerobic digestion projects create Renewable Natural Gas that will displace Non-Renewable Natural Gas. Anaerobic digestion allows the creation of an energy source from waste, that is not obtainable from composting.

# Estimated Costs - Town of Kingsville

Estimated Costs include the following:

- ▶ Curbside Collection and other services provided directly by municipality
- ▶ Capital expenses (including landfill gas collection system expansion), operating expenses and revenues
- ▶ Does not include costs associated with wastewater sludge processing

Year	Composting at Landfill	AD with Landfill Gas	AD at WBPF
2025	\$294,539	\$426,565	\$605,386
2026	\$301,853	\$439,320	\$625,509
2027	\$314,291	\$457,422	\$651,283
2028	\$322,151	\$471,180	\$673,030
2029	\$335,426	\$490,596	\$700,763
2030	\$343,875	\$505,439	\$724,266
2031	\$358,045	\$526,266	\$754,110
2032	\$367,130	\$542,283	\$779,516
2033	\$382,258	\$564,628	\$811,636
2034	\$392,029	\$581,914	\$839,101
2035	\$408,183	\$605,893	\$873,676

# Changes to EWSWA Costs

- ▶ Includes changes in tipping fees at landfill
- ▶ Includes transition of Blue Box Program to the Extended Producer Responsibility (EPR) program in 2027
- ▶ Assumes launch of Organics program in 2025
- ▶ Assumes 2% inflation per year
- ▶ Assumes AD at the Landfill

Year	Expenditures	Non-Municipal Revenue	Municipal Costs (Fixed Costs + Tipping Fees)	Estimated Increase
2021	\$29,149,220	\$13,490,050	\$15,659,170	\$0
2022	\$29,498,877	\$14,678,050	\$14,820,827	\$0
2023	\$30,058,452	\$15,112,050	\$14,946,402	\$0
2024	\$30,638,480	\$15,179,050	\$15,459,430	\$0
2025	\$57,929,024	\$34,391,432	\$23,537,592	\$7,539,136
2026	\$59,608,062	\$35,268,057	\$24,340,005	\$7,812,194
2027	\$51,209,668	\$29,423,616	\$21,786,052	\$8,134,102
2028	\$52,741,236	\$30,279,548	\$22,461,688	\$8,429,606
2029	\$54,460,250	\$31,170,750	\$23,289,500	\$8,776,955
2030	\$56,202,796	\$32,098,674	\$24,104,122	\$9,096,656
2031	\$58,052,512	\$33,064,835	\$24,987,677	\$9,471,492
2032	\$59,683,610	\$34,070,807	\$25,612,803	\$9,817,397
2033	\$61,399,712	\$35,118,231	\$26,281,481	\$10,221,932
2034	\$63,135,068	\$36,208,815	\$26,926,253	\$10,596,217
2035	\$64,983,102	\$37,344,338	\$27,638,764	\$11,032,844

# Information to be Considered

- ▶ The population and population density figures that have identified the level of participation for each municipality are based on the 2016 census, consideration should be given for growth in each municipality
- ▶ Ontario's Environment Plan includes the development of a proposal to ban food waste from landfill (target - 2030)
- ▶ Regional landfill expenditures are predominantly fixed, any diversion activities that result in the redirection of waste from the landfill will not generate a savings for the municipalities
- ▶ The diversion of waste from the landfill may increase the tipping fees for municipalities that do not participate in organics diversion
- ▶ A regional solution from the onset would ensure consistent public education for all residents
- ▶ Targets would likely not be achieved through depot collection
- ▶ The success of an organics program can be influenced by the structure of traditional garbage collection programs (restrictions on garbage will encourage organics diversion). Consideration should be given to current waste collection contract expiration dates
- ▶ Terms of the project and resulting recommendations combine two sets of requirements: organics legislation and energy plan targets

# EWSWA Board

At the October 5, 2021 meeting the EWSWA Board approved the following:

That the Essex-Windsor Solid Waste Authority RECEIVE the following recommendations of the Food and Organics Waste Management Oversight Committee, as amended and refer to Essex County Council for direction:

1. That the Food and Organic Waste Management Oversight Committee BE DIRECTED to proceed with a Procurement Plan for an organic waste management facility that meets the following minimum criteria:
  - a. That, should a new facility be constructed, the facility BE LOCATED:
    - ▶ on lands adjacent to the Regional Landfill, or
    - ▶ on lands adjacent to the Windsor Biosolids Processing Facility, or
    - ▶ at a site supplied by a proponent through the procurement submissions, and;
  - b. That, consistent with the intent of the City of Windsor Community and Corporate Energy Plans and the Essex County Regional Energy Plan, that the RFP BE REQUIRED to utilize a technology that produces renewable energy, in addition to helping municipalities move towards their greenhouse gas reduction goals and to meet or exceed waste diversion targets set out in the OPPS, and;
  - c. That the RFP BE REQUIRED to accept, at a minimum, source separated organics from Windsor and the County of Essex, and;

# EWSWA Board Cont'd

- d. That if the facility is located at the Windsor Biosolids Processing Facility, biosolids from the City of Windsor's wastewater treatment facilities BE INCLUDED in the minimum feedstock, with the costs and revenues related to the processing of the biosolids portion of the feedstock being apportioned to the City of Windsor, and;
  - e. That industry standards BE EXCEEDED regarding odour control measures implemented at the facility and the end product, and;
2. That the EWSWA Board APPROVE a sole source for the next phase of consulting services related to the preparation of a Request for Qualifications, followed by an RFP to GHD for additional fees at an upset limit of \$50,000, and that the EWSWA Board approve the terms of reference prior to the publishing of the RFQ and the RFP, and;
3. That the Council of the County of Essex be requested to initiate and lead organics collection and processing on a regional basis, and;
4. That the Food and Organics Waste Oversight Committee BE DIRECTED to report back to the EWSWA Board with a recommended Procurement Plan outlining project delivery model selection, timing and next steps, and;
5. That the Food and Organics Waste Oversight Committee BE DIRECTED to investigate planning and environmental approval requirements for the municipally owned sites adjacent to the regional landfill in the County of Essex and the Windsor Biosolids Processing Facility in the City of Windsor and report findings back to the Board, and;
6. That, prior to any contract award, the General Manager of EWSWA BE DIRECTED to report back to the EWSWA Board with a Regional Food and Organics Waste Management Plan, such plan to include the proposed funding model including sharing of expenses, revenues and environmental credits and responsibilities of all parties related to the facility, including biosolids processing if the Windsor Biosolids Processing Facility is the selected location, and the food and organic waste collection system.



# County Council

- ▶ On October 20, 2021 Essex County Council approved the following:

**THAT** the Essex County Council consider a Regional approach to the Food and Organics Waste Management Project as it relates to participation from municipalities and report its decision back to the Essex-Windsor Solid Waste Authority no later than December 31, 2021.

# Benefits to Participation at the Onset

- ▶ Consistent service levels throughout Essex-Windsor
- ▶ Can establish a regional collection system, which will lower collection costs
- ▶ Regional Promotion & Education (P&E) programs can be simplified to provide the same service across the region
- ▶ Higher SSO waste committed to at the onset will result in lower per tonne costs
- ▶ Higher costs to enter into SSO program at a later date
- ▶ A regional solution would likely yield higher diversion

Thank you!