B.1 Organics Processing Facilities (OPF) - New Stand-Alone Profile

CAPITAL PROFILE REPORT

PROFILE NAME:	**ORGANICS PROCESSING FACILITIES (OPF)**		RECOMMENDED
PROFILE NUMBER:	**19-81-2049**	PROFILE STAGE:	**Council Review**
DEPARTMENT:	**Integrated Infrastructure Services**	PROFILE TYPE:	**Standalone**
LEAD BRANCH:	**Infrastructure Planning & Design**	LEAD MANAGER:	**Pascale Ladouceur**
PROGRAM NAME:		PARTNER MANAGER:	**Michael Labrecque**
PARTNER:	**Waste Management Services**	ESTIMATED START:	**October, 2019**
BUDGET CYCLE:	**2019-2022**	ESTIMATED COMPLETION:	**June, 2025**

Service Category: **Utilities** **Major Initiative:**

GROWTH	RENEWAL
	100

PREVIOUSLY APPROVED:	-
BUDGET REQUEST:	5,440
TOTAL PROFILE BUDGET:	5,440

PROFILE DESCRIPTION

This Stand-alone Capital Profile supports the development of the P3 business case for the Organics Processing Facilities Project under the Waste Services IIS Infrastructure capital budget. Included in this profile are activities required to advance the development of the P3 business case, specifically funds required to award the Owner's Engineer and Financial Advisor contracts.

The Organics Processing Facilities Project is a long-term solution to address organics processing capacity at the Edmonton Waste Management Centre. The OPF Project is a key solution of the 25-year Waste Strategy, which focuses on long-term capacity and processing capabilities at the EWMC. Starting in mid-2020, the rollout of the Source Separated Organics Program will increase the amount of organic materials that will need to be processed at the site.

This capital profile aims to achieve the following outcomes:
Develop the business case to justify the selection of entering into a Public Private Partnership procurement.

Long-term goals include:
To resolve the current lack of processing facility due to the closure of the Edmonton Composting Facility.
To provide capacity for organic waste processing based on projected long-term numbers.
To consider the feasibility of partnering with regional municipalities.
To produce renewable natural gas as a by-product of the process if anaerobic digestion process is selected.

This project will adhere to both the PDDM process as well as City Policy C555 to ensure that sufficient justification is prepared in advance of the acceptance of the P3 business case and approval to procure a P3 partner. As this stand-alone profile only currently includes Planning and Design costs, Project Delivery costs will be added to this profile through a formal budget adjustment process upon Council approval of the business case.

PROFILE BACKGROUND

The City of Edmonton provides waste collection for almost 400,000 residential households and some non-residential customers. The waste is processed and disposed of at the Edmonton Waste Management Centre, a 233-hectare site located in northeast Edmonton.

In 2017 structural issues were identified with the Edmonton Composting Facility (ECF) Aeration Hall. These findings led to the facility's partial winter closure in 2017 and 2018 to ensure safe operation. In spring 2019, the decision was made to close the facility permanently due to the structural deterioration of the roof. The Anaerobic Digestion Facility (ADF), which was recently completed, was only anticipated to complement the processing capacity at the ECF, and as such, there is a large capacity deficit for processing organic material.

The new OPF, if anaerobic digestion technology is selected, will provide a replacement facility for the ECF with Renewable Natural Gas (RNG) as a byproduct, and will include the operations and maintenance of the existing ADF and Cure Sites. This project is intended to be operated over a 25 to 30-year period by a Private Partner under the P3 procurement method.

PROFILE JUSTIFICATION

The new OPF will provide a replacement organics processing facility for the ECF. The OPF will utilize anaerobic digestion with Renewable Natural Gas (RNG) as a byproduct, or other mature technologies on the market. The project will include the operations and maintenance of the existing ADF and Cure Sites, and is intended to be operated over a 25 to 30-year period by a Private Partner under the P3 procurement method.

The contract awards for the Owner's Engineer and Financial Advisor to facilitate development and advancement of the P3 business case are contingent upon approval of this stand-alone profile.

CAPITAL PROFILE REPORT

STRATEGIC ALIGNMENT

Projects following the PDDM approach for Waste Services align with the following City of Edmonton strategic goals:
Healthy City/Urban Places/Regional Prosperity/Climate Resilience

Further, the strategy will be driven by the City's 90 percent waste diversion goal through beneficial processing, aided by source separation of residential waste. This will contribute to the City's 10-year strategic goals to preserve and sustain Edmonton's environment and ensure Edmonton's financial sustainability.

ALTERNATIVES CONSIDERED

The alternative of repairing the aeration hall and roof structures was investigated and rejected due to significant risk and cost to the City. The alternative of continuing with composting also does not provide the same level of environmental and economic benefits. The alternative of the City designing, building and operating a new facility will be the base case for the P3 value for money comparison.

COST BENEFITS

Waste Services & IIS will ensure the procurement is the most beneficial prior to entering into a long-term commitment.
Other benefits (longer term)
Mitigate costs of sending organics to landfill or trucking to other processing facilities
Addresses long-term processing need of increased organics volume due to population growth
Improved quality & sale value of output
Longer term balances payments of Capital
RNG byproduct as a revenue source

KEY RISKS & MITIGATING STRATEGY

1. RISK: Risk that government approval on a program and/or project level are not received in a timely manner, ultimately resulting in the delay of the issue of tenders.
MITIGATION / COMMENT: City approval of Initial Alternative in February 2019. Low risk as project is priority for Council, low probability of not obtaining approval for business case in April 2020. Owner's Engineer contract can be changed to Design Engineer.

2. RISK: Risk of a longer planning and procurement period for P3 resulting in a higher total program cost (impacted by policy and strategy).
MITIGATION / COMMENT: The current schedule is reasonable at 21 months. There are two approvals prior to contract award for CMAR. CMAR has more procurements but P3 procurement is more complex.

RESOURCES

The project will be led by the Commercial Manager and Project Lead. A small City project team with members from Waste Services and IIS will provide input. The project will also be supported by Owner's Engineer and Financial Adviser (throughout the Design and Build Phase).

CONCLUSIONS AND RECOMMENDATIONS

Conclusion: The costs for verifying the business case are expected to be larger for the development of the P3 project. Once the procurement has been awarded there is less administration of the P3.

It is recommended that the project be funded for the development of the business case and concept design activities.

CAPITAL PROFILE REPORT

Profile Page 3

PROFILE NAME: **Organics Processing Facilities (OPF)** RECOMMENDED

PROFILE NUMBER: **19-81-2049** PROFILE TYPE: **Standalone**

BRANCH: **Infrastructure Planning & Design**

CAPITAL BUDGET AND FUNDING SOURCES (000's)

		Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
APPROVED BUDGET	Approved Budget												
	Original Budget Approved	-	-	-	-	-	-	-	-	-	-	-	-
	Current Approved Budget	-	-	-	-	-	-	-	-	-	-	-	-
BUDGET REQUEST	Budget Request	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440
	Revised Funding Sources (If approved)												
	Waste Mgt Retained Earnings	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440
	Requested Funding Source	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440
REVISED BUDGET (IF APPROVED)	Revised Budget (If Approved)	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440
	Requested Funding Source												
	Waste Mgt Retained Earnings	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440
	Requested Funding Source	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440

CAPITAL BUDGET BY ACTIVITY TYPE (000's)

	Activity Type	Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
REVISED BUDGET (IF APPROVED)	Design	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440
	Total	-	1,298	3,328	815	-	-	-	-	-	-	-	5,440

OPERATING IMPACT OF CAPITAL

Type of Impact:

Branch:	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE
Total Operating Impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

B.2 Advanced Energy Research Facility (AERF) Upgrade - New Stand-Alone Profile

CAPITAL PROFILE REPORT

Profile Page 1

PROFILE NAME:	**ADVANCE ENERGY RESEARCH FACILITY (AERF) UPGRADE**		RECOMMENDED
PROFILE NUMBER:	**19-81-2050**	PROFILE STAGE:	**Council Review**
DEPARTMENT:	**Utilities**	PROFILE TYPE:	**Standalone**
LEAD BRANCH:	**Waste Management Services**	LEAD MANAGER:	**Michael Labrecque**
PROGRAM NAME:		PARTNER MANAGER:	
PARTNER:		ESTIMATED START:	**March, 2019**
BUDGET CYCLE:	**2019-2022**	ESTIMATED COMPLETION:	**February, 2022**

Service Category: **Utilities** **Major Initiative:**

GROWTH	RENEWAL
50	50

PREVIOUSLY APPROVED:	-
BUDGET REQUEST:	1,150
TOTAL PROFILE BUDGET:	1,150

PROFILE DESCRIPTION

The upgrade of the Advanced Energy Research Facility (AERF) at the Edmonton Waste Management Centre (EWMC) is being undertaken as part of an initiative called Alberta Clean Energy Technology Accelerator (ACETA), which would help to improve the viability and financial sustainability of the AERF. As part of this initiative, Alberta Innovates, through its Climate Change Innovation and Technology Framework (CCITF) program, has provided a $2.09 million grant to the AERF. Of the total funding received by the City ($2.09 million), an estimated amount of $1.15 million will be spent on five capital construction/upgrade projects listed in the "Project List" section below. The remaining funding will be used as operating funds. As a result, no City/Waste Services Utility funding is anticipated to be required for these upgrades.

This is a three year initiative which starts in 2019 and will be completed in the first quarter of 2022. Although work commenced in March under the Waste Services Infrastructure & Facilities composite profile utilitizing grant funding, a separate standalone profile for this project is proposed to be established to facilitate and segregate project cost reporting and grant tracking as required by the grantor.

The design aspects of all five projects are to be completed by the end of 2019, whereas the procurement and construction are to be completed by the end of 2020. The City of Edmonton as lead applicant of the grant, will be managing the funds. A governance structure was developed and subcontract agreements were signed with all ACETA partners.

PROJECT LIST

An estimated amount of $1.15 million will be spent for the following capital construction/upgrade projects:
Project 1: Upgrading the microbiology and waste characterization laboratories. This will include major upgrade of the ventilation system to render the biological lab a certified class II lab.

Project 2: Micro-generation of electrical power for the processes at AERF. This will allow the reduction of power demand changes at AERF, while improving its carbon footprint.

Project 3: Procurement of biogas sampling, transport and storage system.

Project 4: Addition of more incubation space (pods) at the AERF.

Project 5: Upgrading the pilot Refuse Derived Fuel (RDF) processing facility by procuring small size screens and more RDF densification capability.

PROFILE BACKGROUND

ACETA is a cross-institutional hub that is being developed by the City of Edmonton, InnoTech Alberta-Vegreville, the University of Alberta's Future Energy Systems and CanmetEnergy-Devon. The purpose is to create a world-leading clean energy technology accelerator, for piloting and scaling-up of innovations in biomass, municipal solid waste, renewable gas utilisation as well as hydrocarbon processing and upgrading technologies.

The upgrade of the Advanced Energy Research Facility (AERF) is being undertaken as part of an initiative called Alberta Clean Energy Technology Accelerator (ACETA), which would help to improve the viability and financial sustainability of the AERF.

PROFILE JUSTIFICATION

Each of the five initiatives will allow AERF to increase its capabilities and to reduce its operating cost, thereby rendering the AERF more financially sustainable.The power micro-generator will reduce the demand charges which represents more than 50% of the AERF electricity bill of more $100,000 per year. More incubation space will allow the AERF to attract more tenants and increase revenue generation streams.

STRATEGIC ALIGNMENT

Alberta Clean Energy Tech. Accelerator (ACETA) is a cross-institutional hub that is developed by the City, InnoTech Alberta-Vegreville, U of A's Future Energy Systems & CanmetEnergy-Devon to become a world-leading clean energy tech. accelerator, piloting & scaling-up of innovations in biomass, municipal solid waste, renewable gas utilisation, hydrocarbon processing & upgrading technologies.

The initiative aligns with the City & Waste Services vision to become a leader in climate change & clean energy technology, while improving financial sustainability of research and development program.

CAPITAL PROFILE REPORT

ALTERNATIVES CONSIDERED

The only alternatives would be:
1) For the City to fund 100% of the required upgrades to the facility which may not be financially feasible.
2) Leave the facility as is without upgrades, which would lead to an outdated facility and technology gaps, resulting in lower tenancy and financial sustainability.

COST BENEFITS

AERF had been seeking this type of funding initiative to upgrade the facility in order to attract more tenants or partners and become financially sustainable. Securing a grant to assist on what otherwise will be funded completely by the Utility is an excellent benefit. In addition, the consortium is unique and has the potential to become a world-leading body, addressing major technological gaps on technologies which would serve the City well.

KEY RISKS & MITIGATING STRATEGY

A major risk is not being able to deliver on time and on budget. This is mitigated through budget control and strong project management.

RESOURCES

Waste Services has the technical resources to carry out the projects and no additional or external resources are required. Detailed engineering work will be contracted out following the City's procurement guidelines and protocols.

CONCLUSIONS AND RECOMMENDATIONS

The upgrade of the Advanced Energy Research Facility (AERF) is being undertaken as part of an initiative called Alberta Clean Energy Technology Accelerator (ACETA), which would assist in improving the viability and financial sustainability of the AERF. These initiatives will allow AERF to increase its capabilities, reduce its operating cost and increase tenancy, thereby rendering the AERF more financially sustainable.

It is recommended that a stand-alone profile for this project is established to facilitate project cost reporting and grant tracking as required by the grantor.

CAPITAL PROFILE REPORT

Profile Page 3

PROFILE NAME: **Advance Energy Research Facility (AERF) Upgrade** RECOMMENDED

PROFILE NUMBER: **19-81-2050** PROFILE TYPE: **Standalone**

BRANCH: **Waste Management Services**

CAPITAL BUDGET AND FUNDING SOURCES (000's)

		Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
APPROVED BUDGET	Approved Budget												
	Original Budget Approved	-	-	-	-	-	-	-	-	-	-	-	-
	Current Approved Budget	-	-	-	-	-	-	-	-	-	-	-	-
BUDGET REQUEST	Budget Request	-	25	575	550	-	-	-	-	-	-	-	1,150
	Revised Funding Sources (If approved)												
	Other Grants - Provincial	-	25	575	550	-	-	-	-	-	-	-	1,150
	Requested Funding Source	-	25	575	550	-	-	-	-	-	-	-	1,150
REVISED BUDGET (IF APPROVED)	Revised Budget (If Approved)	-	25	575	550	-	-	-	-	-	-	-	1,150
	Requested Funding Source												
	Other Grants - Provincial	-	25	575	550	-	-	-	-	-	-	-	1,150
	Requested Funding Source	-	25	575	550	-	-	-	-	-	-	-	1,150

CAPITAL BUDGET BY ACTIVITY TYPE (000's)

	Activity Type	Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
REVISED BUDGET (IF APPROVED)	Other Costs	-	25	575	550	-	-	-	-	-	-	-	1,150
	Total	-	25	575	550	-	-	-	-	-	-	-	1,150

OPERATING IMPACT OF CAPITAL

Type of Impact:

Branch:	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE
Total Operating Impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

B.3 Interim Organics Processing Solution - New Stand-Alone Profile

CAPITAL PROFILE REPORT

PROFILE NAME:	**INTERIM ORGANICS PROCESSING SOLUTION**		**UNFUNDED**
PROFILE NUMBER:	**20-81-2051**	PROFILE STAGE:	**Entry - Create Profile**
DEPARTMENT:	**Integrated Infrastructure Services**	PROFILE TYPE:	**Standalone**
LEAD BRANCH:	**Infrastructure Planning & Design**	LEAD MANAGER:	**Pascale Ladouceur**
PROGRAM NAME:		PARTNER MANAGER:	**Michael Labrecque**
PARTNER:	**Waste Management Services**	ESTIMATED START:	
BUDGET CYCLE:	**2019-2022**	ESTIMATED COMPLETION:	

Service Category: **Major Initiative:**

GROWTH	RENEWAL
	100

PREVIOUSLY APPROVED:	-
BUDGET REQUEST:	5,000
TOTAL PROFILE BUDGET:	5,000

PROFILE DESCRIPTION

Anticipating a shortfall in organics processing capacity, Waste Services advertised two Requests for Information (RFI) in August 2019 to evaluate potential alternative interim composting solutions. The main purpose of these RFIs was to gather information about viable options that would be able to process the City's organic waste during the interim period until the OPF can be commissioned. These options will be evaluated and brought back for Council approval with a business case in spring 2020.

PROFILE BACKGROUND

The City commenced operation of the ECF in 2001. A building assessment was completed by external consultants in 2016, which noted that corrugated ceiling panels appeared to have buckled. A 3rd party inspections completed in 2017 indicated that the roof was not capable of handling snow load & could only operate seasonally. Waste Services received Council approval to permanently shut down the facility in Spring 2019.

In 2016, the final year in which the facility was operated year-round, the ECF processed approx 130,000 tonnes of material from various sources.The discontinued use of the ECF results in a significant shortfall in organic waste processing capacity. Construction of a new OPF is being planned to alleviate this shortfall, however it will not be fully operable until 2025.

Currently, the City is planning a cart roll-out program starting in summer 2020 where residents will dispose of their organics separately from their other household waste (SSO). It will make organic waste easier to process & divert from landfill. This interim solution is being sought to close the gap between the anticipated SSO collected, & current processing capacity until an OPF can be commissioned.

PROFILE JUSTIFICATION

The $5 million estimate is based on several high-level responses from the RFI. Additional refinement of the cost profile would take place as the options are explored in further detail.

STRATEGIC ALIGNMENT

On September 10, 2019, City Council voted in favor of the 25-year Waste Strategy and accompanying Single Unit Waste Set-out Business Case and Waste Services Bylaw. This approved direction requires residents to separate their organic waste from residual waste to support effective processing and contribute to the overall goal to divert 90 percent of waste from landfill. An interim organics processing solution would enable Waste Services to process and divert the additional SSO that is collected from residents.

ALTERNATIVES CONSIDERED

There are several viable alternatives for the interim organics processing solution being considered. All alternatives will be explored as to feasibility and cost effectiveness. Waste Services will return with a business case in spring 2020 with final proposed alternative for Council consideration.

COST BENEFITS

A full cost-benefit analysis will be conducted between the options as part of the evaluation of a preferred solution. Of note: a "do nothing" approach has a cost of approximately $50/tonne to transport and dispose of organics material at a landfill.

KEY RISKS & MITIGATING STRATEGY

Implementing a Source Separated Organics Program, then not processing the organics waste, has a significant reputational risk for Waste Services. SSO programs throughout North America struggle to gain compliance and participation. If residents do not feel there is a benefit for making the extra effort to separate their waste, it will be difficult to successfully implement this program. Additionally, it will be difficult to meet City Council's diversion goal of 90 percent.

RESOURCES

Waste Services and its existing organics processing contractor are capable of processing and diverting significant volumes of organics from the landfill. As such, no resourcing changes are anticipated with the interim organics processing program.

CAPITAL PROFILE REPORT

CONCLUSIONS AND RECOMMENDATIONS

It is recommended that Waste Services explore options to support the processing of source separated organics until an Organics Processing Facility is fully commissioned in 2025 (anticipated). Several options will be evaluated and considered. The high-level estimate for this solution is currently anticipated at $5 million, but this will be refined as more information is obtained and a recommendation will be brought forward with a business case in spring 2020. This stand-alone capital profile has been included in the 2020 Rate Filing for rate forecasting purposes, however, no commitments will be made until a detailed business case supporting the interim solution is brought forward for approval in spring 2020.

CAPITAL PROFILE REPORT

PROFILE NAME: **Interim Organics Processing Solution** **UNFUNDED**
PROFILE NUMBER: **20-81-2051** PROFILE TYPE: **Standalone**
BRANCH: **Infrastructure Planning & Design**

CAPITAL BUDGET AND FUNDING SOURCES (000's)

		Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
APPROVED BUDGET	Approved Budget												
	Original Budget Approved	-	-	-	-	-	-	-	-	-	-	-	-
	Current Approved Budget	-	-	-	-	-	-	-	-	-	-	-	-
BUDGET REQUEST	Budget Request	-	-	5,000	-	-	-	-	-	-	-	-	5,000
	Revised Funding Sources (if approved)												
	Self-Liquidating Debentures	-	-	5,000	-	-	-	-	-	-	-	-	5,000
	Requested Funding Source	-	-	5,000	-	-	-	-	-	-	-	-	5,000
REVISED BUDGET (IF APPROVED)	Revised Budget (If Approved)	-	-	5,000	-	-	-	-	-	-	-	-	5,000
	Requested Funding Source												
	Self-Liquidating Debentures	-	-	5,000	-	-	-	-	-	-	-	-	5,000
	Requested Funding Source	-	-	5,000	-	-	-	-	-	-	-	-	5,000

CAPITAL BUDGET BY ACTIVITY TYPE (000's)

	Activity Type	Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
REVISED BUDGET (IF APPROVED)	Construction	-	-	5,000	-	-	-	-	-	-	-	-	5,000
	Total	-	-	5,000	-	-	-	-	-	-	-	-	5,000

OPERATING IMPACT OF CAPITAL

Type of Impact:

Branch:	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE
Total Operating Impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-