

# CAPITAL PROFILE REPORT

PROFILE NAME:	<b>GROUNDWATER DIVERSION SYSTEM REPLACEMENT</b>	<b>FUNDED</b>
PROFILE NUMBER:	<b>18-33-2033</b>	<b>PROFILE STAGE: Approved</b>
DEPARTMENT:	<b>Integrated Infrastructure Services</b>	<b>PROFILE TYPE: Standalone</b>
LEAD BRANCH:	<b>Infrastructure Delivery</b>	LEAD MANAGER: <b>Brian Latte</b>
PROGRAM NAME:		PARTNER MANAGER: <b>Michael Labrecque</b>
PARTNER:	<b>Waste Management Services</b>	ESTIMATED START: <b>April, 2018</b>
BUDGET CYCLE:	<b>2015-2018</b>	ESTIMATED COMPLETION: <b>December, 2020</b>

<b>Service Category:</b>	<b>Utilities</b>	<b>Major Initiative:</b>
--------------------------	------------------	--------------------------

<b>GROWTH</b>	<b>RENEWAL</b>	<b>PREVIOUSLY APPROVED:</b>	<b>16,450</b>
	<b>100</b>	<b>BUDGET REQUEST:</b>	<b>-</b>
		<b>TOTAL PROFILE BUDGET:</b>	<b>16,450</b>

## PROFILE DESCRIPTION

This capital profile supports the construction phase activities for installing a functioning groundwater diversion system at an approximate cost of \$13.25M at Clover Bar Landfill. The tentative cost of \$0.5M for developing the system design is not included in this budget request, as it is budgeted in profiles CM-33-1933 and CM-99-0005. The projected \$0.5M in abandonment costs will be an operating expense and therefore also not included in this budget request. Please see the full business case attached for the cost table.

Budget reallocations and savings realized in other Waste Services capital profiles (CM-33-2005 Waste Containers and 16-33-2017 Integrated Processing & Transfer Facility Expansion) will be released to the Utility pool and are sufficient to cover this \$13.25M cost for Groundwater Diversion. As such, this profile will not require an additional new budget request for the overall Utility.

The purpose of the groundwater diversion system is to collect the groundwater and divert it around the the landfill, to be discharged to the North Saskatchewan River. If the groundwater was not diverted in this way, it would put pressure on the landfill liner, which could result in infiltration and contamination.

The capital profile aims to achieve the following outcomes:

- to be able to operate the landfill safely while being in compliance with the City's operating approvals issued by the province; and
- to protect the North Saskatchewan River from any undue contamination from the Clover Bar Landfill.

The Waste Services Branch has engaged a consultant to assess risks, develop multiple solutions and a conceptual design in 2017. The estimated funding requirement requested in this profile is based on this initial conceptual design. The consultant is scheduled to complete preliminary engineering designs by the September of 2017, including an updated estimate. Once this report has been received by Administration, a detailed design of the selected solution will commence. Once the detailed design has been completed in Q4 of 2017, Administration will tender for construction services. At this time the Administration will be able to update the budget estimates with more accurate information and will bring forward any required Supplemental Capital Budget Adjustment. Construction is anticipated to begin in 2018 and will be completed in 2019.

## PROFILE BACKGROUND

The existing groundwater diversion system is no longer functioning as designed. Over the past few years, issues including the followings have been identified:

- Leachate has been breaking through the system and released to the North Saskatchewan River. This has occurred twice in 2017 with no feasible solution to prevent it from happening again.
- The system is comprised of east and west sections. There are three known blockages in the west & one known blockage in the east section. Attempts to flush & clean the system have been unsuccessful.
- Multiple system failures have occurred, including failures of pumphouse equipment and within the structure of some of the manholes.
- The system is constructed with corrugated steel pipe. An inspection of the pipe indicated significant deterioration.
- There are no accurate as-builts and/or records for the system which is making repairs very difficult.
- Emergency repair work is costly & has not proven effective as a long term solution.

The deterioration results in higher than normal groundwater and surface water levels, and potentially introduces contaminants into the groundwater, surface water, and North Saskatchewan River.

## PROFILE JUSTIFICATION

Justification for a new groundwater diversion system:

- Regulatory: The Clover Bar Landfill requires a functioning groundwater diversion system as part of the City's approval to operate;
- Environmental: Reduce the environmental impact of the Clover Bar Landfill on the North Saskatchewan River, the impacts may include discharge of impacted water due to groundwater contamination;
- Operational: Some operational areas at the EWMC, such as the compost cure site, wood chip bunker, and parking lots, have been affected by the high groundwater levels resulting from the deficiencies of the groundwater diversion system;
- Operating and maintenance costs: The existing groundwater diversion system will continue to deteriorate, and requires ongoing maintenance, such as above ground pumping, resealing of leaking joints, and spot repairs. The costs of additional ongoing preventative maintenance due to the deterioration of the system is estimated to be between \$300,000 and \$500,000 per year.

## STRATEGIC ALIGNMENT

The Way We Grow: Transform Edmonton's Urban Form; The Way We Live: Improve Edmonton's Livability; The Way We Green: Preserve & Sustain Edmonton's Environment.

## ALTERNATIVES CONSIDERED

Status quo: The existing system has 3 reportable Leachate releases to the North Saskatchewan River & multiple known blockages. Ongoing inspections, spot repairs, & operational changes are not sustainable & contains a high risk of environmental releases. Not addressing this urgently & sustainably may have regulatory & legal implications from Alberta Environment and Parks. After the second release, Waste Services has committed to start replacing this system in 2018.

Repair the system: The corrugated steel pipe is 40-45 years old. No accurate as-builts and/or records for the system & the east half of the system is built within the Clover Bar Landfill, making the repair work difficult. The pump stations are constantly under repair, requiring new pumps, level sensors, reprogramming, and lighting.

Installation of a new system: Install a functioning system will ensure that EWMC meets the regulatory requirements and avoid any legal complications arising from the deteriorating system.

## COST BENEFITS

- A new system will avoid higher cost caused by the failure of the deteriorating system;
- Failure to comply with landfill conditions may result in regulatory, legal and/or punitive monetary consequences;
- To protect the river & public health;
- Avoid any negative publications resulting from inadvertent releases;
- Designed to current standards resulting in lower operating costs & reduce the effects of high groundwater levels

## KEY RISKS & MITIGATING STRATEGY

New system is near the bottom of landfill slope making repairs difficult & expensive-mitigated by identifying technology to minimize disruption, include using trenchless construction.

Old system abandonment-mitigated by ensuring the new system is fully operational before abandon the old.

Budget adjustment might be needed when design & technology are identified.

Urgent response required for existing system-undertaking initiatives, e.g. over land water pumping, inspections & minor repairs.

## RESOURCES

It requires reallocation of funding from other capital profiles. Infrastructure Planning & Design Team from Integrated Infrastructure Services (IIS) will support Waste Services through the planning, design & delivery stages for this capital profile.

## CONCLUSIONS AND RECOMMENDATIONS

- The groundwater diversion system at Clover Bar Landfill needs to be replaced in order to comply with its operating approval. At this time Administration has concept level project cost estimates as proposed in this capital profile. Once preliminary engineering can be completed, and more accurate funding estimates have been obtained, budget estimates will be updated accordingly.
- It is recommended that this project be funded for the detailed design and construction phase activities in order to replace the current groundwater diversion system at Clover Bar Landfill in a timely manner.

## CHANGES TO APPROVED PROFILE

2019 Fall SCBA #19-32/2.4-1 Transfers >\$2M: Additional funds required due to unforeseen, adverse ground conditions encountered during trenching of both east and west sections and associated costs for remedial action, groundwater pumping, GCs, and consulting due to schedule extension. Transfer of \$3.2M from CM-81-2045: Waste Services IIS Infrastructure Delivery to 18-33-2033: Groundwater Diversion System Replacement. Revised completion date is December 2020.

# CAPITAL PROFILE REPORT

PROFILE NAME: **Groundwater Diversion System Replacement**

**FUNDED**

PROFILE NUMBER: **18-33-2033**

PROFILE TYPE: **Standalone**

BRANCH: **Infrastructure Delivery**

## CAPITAL BUDGET AND FUNDING SOURCES (000's)

APPROVED BUDGET		Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
	Approved Budget												
	Original Budget Approved	-	-	-	-	-	-	-	-	-	-	-	-
	2017 Cap Council	13,250	-	-	-	-	-	-	-	-	-	-	13,250
	2018 Cap Budget Request for Next Cycle	-	5,000	-	-	-	-	-	-	-	-	-	5,000
	2018 Cap Carry Forward	-2,390	2,390	-	-	-	-	-	-	-	-	-	-
	2018 Cap Release to Corp Pool	-5,000	-	-	-	-	-	-	-	-	-	-	-5,000
	2019 Cap Council	-	2,200	1,000	-	-	-	-	-	-	-	-	3,200
	<b>Current Approved Budget</b>	<b>5,860</b>	<b>9,590</b>	<b>1,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>16,450</b>
	Approved Funding Sources												
	Self-Liquidating Debentures	5,860	9,590	1,000	-	-	-	-	-	-	-	-	16,450
	<b>Current Approved Funding Sources</b>	<b>5,860</b>	<b>9,590</b>	<b>1,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>16,450</b>

BUDGET REQUEST													
Budget Request		-	-	-	-	-	-	-	-	-	-	-	-

REVISED BUDGET (IF APPROVED)													
Revised Budget (if Approved)		5,860	9,590	1,000	-	-	-	-	-	-	-	-	16,450
Requested Funding Source													
Self-Liquidating Debentures		5,860	9,590	1,000	-	-	-	-	-	-	-	-	16,450
Requested Funding Source		5,860	9,590	1,000	-	-	-	-	-	-	-	-	16,450

## CAPITAL BUDGET BY ACTIVITY TYPE (000's)

REVISED BUDGET (IF APPROVED)	Activity Type	Prior Years	2019	2020	2021	2022	2023	2024	2025	2026	2027	Beyond 2027	Total
	Construction	5,860	9,590	1,000	-	-	-	-	-	-	-	-	16,450
	<b>Total</b>	<b>5,860</b>	<b>9,590</b>	<b>1,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>16,450</b>

## OPERATING IMPACT OF CAPITAL

Type of Impact:

Branch:																
	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE	Rev	Exp	Net	FTE
<b>Total Operating Impact</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-