City of Prince Albert

RPT 20-497

TITLE: Landfill Cell Design and Expansion

DATE: **January 4, 2021**

TO: Executive Committee

PUBLIC: X **INCAMERA:**

RECOMMENDATION:

That the construction of a new municipal solid waste (MSW) disposal cell north of Cell 1B and the expansion of the existing MSW disposal Cells 1A and 2A at the City of Prince Albert Landfill be referred for consideration during 2021 Budget Deliberations.

TOPIC & PURPOSE:

To provide recommended landfill cell construction and expansion plans for the Prince Albert Landfill to meet the needs for an estimated 20 years of MSW disposal.

BACKGROUND:

The existing landfill site consists of two existing cells; Cell 1A and Cell 2A for waste disposal and Cell 1B for disposal of hydrocarbon impacted soil and to compost biosolids from the City's wastewater treatment plant. Cell 1A and 2A were built in 2002 and 2012 respectively and are currently both active. Cell 1B, constructed in 2015, is not currently being utilized for MSW disposal. With the current MSW disposal rate of 60,000 - 65,000 cubic meters per year, construction of a new cell is required in 2021.

The City retained the services of Tetra Tech Canada Inc. in the summer of 2020 to design a MSW disposal cell after determining that the existing MSW cells were reaching capacity and new cell construction would be required in 2021. Tetra Tech was also tasked to provide a plan to manage the overfilling of waste that had occurred outside the boundary of Cells 1A and 2A.

PROPOSED APPROACH AND RATIONALE:

Tetra Tech undertook a review of cell design options to determine the advantages and disadvantages with expanding into the footprint of Cell 1B, Cell 2B or Cell 3A. Each potential location was assessed based on the following objectives:

- Ensuring regulatory requirements for environmental protection are met;
- Maximizing on short and long term airspace
- Reducing construction cost (i.e., minimizing cut and fill for base of liner);
- Integration with existing operations and infrastructure (i.e., cell access, leachate management)

There were three key components to the landfill cell design that administration tasked Tetra Tech to complete:

1. New Cell Design

   The recommended design City administration endorsed was to expand the footprint of Cell 1B, which when it was constructed in 2015 only utilized half the Cell. This will require a reapplication for the Permit to Operate which expires in June of 2021 to operate under Municipal Refuse Management Regulations to which the Saskatchewan Ministry Of Environment has provided a new template for consideration. The new Permit would allow the MSW Cells to accept industrial waste, which includes the hydrocarbon impacted material, for up to 20% of its total quantity of waste. The current Cell 1B and its expanded area would become a MSW disposal cell.

2. Modification to Existing Cells Footprint

   The existing Cell 1A and Cell 2A have been proposed to expand to the south and Cell 1A to the east to remediate the horizontal overfilling of waste along the slopes of the cells and construct the slopes to the approved design slope of 3(H):1(V).

3. Increasing Maximum Top of Waste Elevation

   The existing maximum elevation within the Environmental Impact Statement is 471 metres above sea level. The design for the Cells elevation increases in two phases, 480 metres when Cell 1A, 2A and 1B have reached capacity and 510 metres when the future Cell 2B is constructed and reaches capacity. Prior to the second phase, meetings with the adjacent land owners will occur to provide site lines demonstrating if the increased Cell elevation will be visible.

The three key design components noted above, to expand Cell 1B and retrofit Cell 1A, 2A and 1B will generate an estimated **20 years** of waste capacity at the current 5 year average of 80,746 tonnes per year. The survey data has determined that approximately 60,400 cubic meters of airspace was consumed over a year from 2019 to 2020.

The future construction of Cell 2B will optimize the design components and is estimated to generate 40 additional years of waste capacity. Cell 2B will provide for a square base, which allows the greatest increase to maximum elevation for a flat topped pyramid mound compared to one with an L shape, which Cell 1 B expansion will create.

The 2021 project scope will include earthwork, clay liner, HDPE liner, drainage aggregate and leachate collection system.

The Detailed Design is now 60% completed resulting in TetraTech being able to provide a Class B (+-15%) construction cost estimate of $6,000,000. Still, we must caution City Council that the actual construction cost cannot be known until the tender's submissions have been received. This will happen in the spring of 2021 when a report to award will be in front of Council.

CONSULTATIONS:

The completion of the 60% Detailed Design included consultations with industry professionals and provincial regulators.

COMMUNICATION AND/OR ANNOUNCEMENT PLAN:

Upon budget approval, the City will submit to the provincial regulator for review.

FINANCIAL IMPLICATIONS:

For capital budget purposes, the following estimates for construction and engineering will be included in the capital plan, to be considered at budget deliberations:

2020 Approved Budget:	$330,000
2021 Construction Budget:	$6,000,000
Total Project Cost:	**$6,330,000**

It is recommended that the project be funded with debt financing with interest and principal repayments to be funded from the Sanitation Improvement Fund.

OTHER CONSIDERATIONS/IMPLICATIONS:

There are no Policy, Privacy or Official Community Plan implications, or options to recommendations.

STRATEGIC PLAN:

The construction of a new Landfill Municipal Waste Disposal Cell supports the City's strategic goal of creating infrastructure that supports growth while planning for continuous improvement.

PUBLIC NOTICE:

Public Notice pursuant to the Public Notice Bylaw No. 24 of 2015 is not required.

PRESENTATION: PowerPoint Presentation by Nykol Miller

ATTACHMENTS:

Landfill Cell Construction.pdf

Written by: Nykol Miller, Capital Projects Manager

Approved by: Director of Public Works & City Manager