



Landfill Feasibility Assessment Camrose Regional Landfill

SWANA Northern Lights Chapter
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AGENDA

1. Background
2. Project Scope
3. Project Findings
4. Outcomes of Findings
5. Recommendations for Other Landfill Owners



Background

Camrose Regional Sanitary Landfill – 2021 Financial Feasibility Assessment

Camrose Regional Landfill - Background

The Camrose Regional Landfill (CRLF) started operations in 1982 and is operated by the Camrose Regional Solid Waste Authority (CRSWA). The CRSWA is a partnership between the following jurisdictions:

- City of Camrose (2022 pop. 19,847),
- Camrose County (2022 pop. 9,208), and
- The Village of Bittern Lake (2022 pop. 234).



In 2021, increases to the estimates of the closure and post-closure costs for the CRLF required the first ever cash-call to the members of the CRSWA. In response to the cash-call, the CRSWA requested the completion of a landfill feasibility study to determine how to proceed with the Site and solid waste management in the region.

Camrose Regional Landfill – Issues

The following are the issues, in addition to the increase in closure and post-closure costs impact the financial viability of the landfill:

1. Local competing regional landfill 31km away.
2. High leachate disposal costs.
3. Cell constructability issues:
 - 3A. Height restriction due to proximity of the Stoney Creek valley (due to slope stability concerns)
 - 3B. Cell excavation depth restriction due to high groundwater table
4. Historically low tipping fees. Therefore, significant increases in fees were required to increase revenue, but as tipping fees increase tonnages decrease.
5. Monthly operating contract based only on hours of operation; contract not tied to quantities. As tonnages decreased there was no reduction in operating costs.



Project Scope

Scope of Study

Background Information Review:

- Review operational costs and revenues, tonnages, tonnages projections, financial reserves, operations contract, landfill lifespan, capital and operational budgets, and closure and post-closure care estimate.

Financial Model Development:

- Develop a financial evaluation model including a tipping fee analysis to evaluate potential future operations. The following options were modelled:
 - Option 1 – Existing Landfill Operation
 - Model the current status quo: Landfill, composting, recycling, concrete & asphalt recycling, to be used as a basis for comparison

Scope of Study Continued

- Option 2a – Optimized MSW Landfill Operation
 - Improvements included leachate management & direct haul of residential waste to West Dried Meat Lake Landfill (WDML). WDML is approximately 31km one-way haul.
- Option 2b – Optimized C&D Landfill Operation
 - Convert future Class II (MSW) cells to Class III (C&D) landfill cells, continue with composting & recycle operation and direct haul of residential waste to WDML.
- Option 3 – Transfer Haul
 - Close the landfill, continue with other diversion activities on-site, develop a transfer station, make improvements to leachate management, & direct haul of residential waste to WDML.



Project Data

Project Data

2021 Incoming Tonnages:

| Material Type | t |
|-----------------------|---------------|
| MSW | 4,600 |
| C&D | 2,800 |
| ICI | 6,900 |
| Landfill total | 14,300 |
| Soil | 15,300 |
| Organics | 2,700 |
| Recycle | 300 |

Waste Composition:

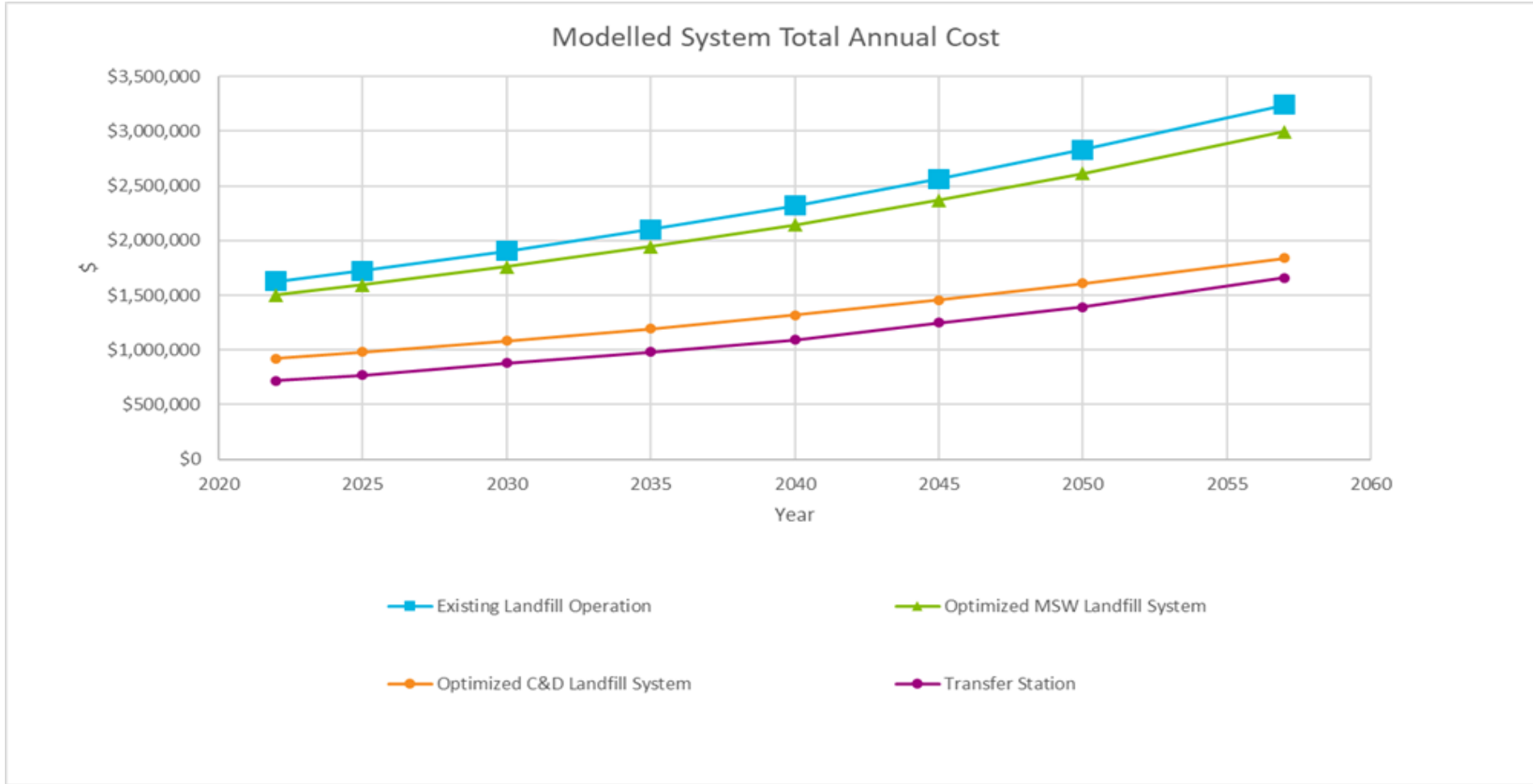
| Waste Composition | % |
|-------------------|----|
| ICI | 50 |
| MSW | 30 |
| C&D | 20 |

Future tonnages and compositions are based on the average of the last 5 years. In addition, the model had to identify reductions in tonnages based on increasing tipping fees. Adjustment factors were developed for large haulers based historical reactions to increases in tipping fees and discussion with the haulers. This varied from 0% reduction to 95% reduction.

Project Data & Assumptions

- Landfill cell construction:
 - Total costs \$63/m², on based 600mm clay liner design
 - 13 ha remaining to be constructed
 - Cell excavation limited to only 0.4m due to high groundwater level
 - \$8M to construct the remaining cells
- Landfill closure costs are estimated to be \$8M, with closure in 2057. Annualized cost is \$227,400.
- Landfill post closure costs \$5.5M. Annualized cost is \$188,000.
- Total closure and post-closure is \$13.5M. Annualized cost is \$415,400.
- Current leachate operations costs: \$285,000, for 4,300m³ based on deep well injection. Other options were identified with lower operating costs.
- Class III (C&D) cells do not require a liner or leachate collection system
- Estimated capital cost for grade-separated transfer station using eight (8) 40 cu yd. is \$1.7M.
- Compost facility (10,270 m²), pricing provided to replace existing facility with a new development to meet new version of the Alberta Code of Practice for Compost Facilities. Estimated costs \$1.3M

Project Findings



In 2022 dollars, the savings in switching from the current landfill operation to a transfer station is \$905,000.

Projected Tipping Fees (\$ / tonne)

| Year | Existing Landfill | Optimized MSW Landfill | Optimized C&D Landfill | Transfer Station | Compost | Recycle | Concrete & Asphalt |
|------|-------------------|------------------------|------------------------|------------------|---------|---------|--------------------|
| 2022 | \$104 | \$95 | \$235 | \$150 | \$36 | \$27 | \$16 |
| 2057 | \$146 | \$135 | \$332 | \$250 | \$50 | \$38 | \$27 |

Notes:

- Projected tipping fees are based on cost recovery only.
- Direct comparison of options based on proposed tipping fees is not possible as the tonnages vary significantly with each option.
- 2057 is the estimated closure year for the landfill.
- C&D landfill costs / tonne is quite high to the small amount of C&D waste available.
- Optimized MSW landfill is mainly due to the construction and operation of a leachate pond with an evaporator, rather than deep well injection.
- Transfer station fees are higher than typically required due to the inclusion of the closure and post-closure costs of the existing landfill. Excluding these cost would reduce the tipping fee to \$128 / tonne.



Outcomes of Findings

Study Recommendation

Close existing landfill and build a waste transfer station. Continue to operate the waste diversion activities at the site.

- Moving to transfer station would result in an annual savings of 56% compared to only an 8% annual savings moving to the optimized landfill operation.
- Suggest moving to internal operation of the transfer station by municipal staff rather than an external contractor for facility operation.
 - Could allow shared Full Time Equivalent (FTE) between site operations and other operations within City of Camrose rather than staffing 1 FTE for the transfer station alone as the facility is only open 4 days / week



Recommendations for Other Landfill Owners

Lessons Learned & Recommendations for Other Landfill Operators

- Solid waste managers TO EVALUATE financials annually including:
 - Develop and maintain a detailed financial model of all of your operations to ensure tipping fees are covering all current and future costs.
 - To conduct sensitivity analysis with a range of tonnages by type (organic, diversion, residual) within a financial model to develop a range of tipping fees
 - Make sure all of your assumptions are clearly identified.
 - Frequently update closure and post-closure costs.
 - Be open to changes in operations to improve the financial results.
- Waste is a volume business. Once you start losing tonnage it becomes slippery slope with tipping fees increases to try and maintain revenue.
- Need to monitor what your competitors are doing (tipping fee checks).
- Once customers leave it is difficult to entice them to return.
- If a consultant develops a model, retain the model and update annually

Thank you.

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