



# MATERIAL RECOVERY FACILITY REVIEW

## STRONG TOWNSHIP

Continuous Improvement Fund  
September 2016

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## **Acknowledgement**

This Project has been delivered with the assistance of Waste Diversion Ontario's Continuous Improvement Fund, a fund financed by Ontario municipalities and stewards of blue box waste in Ontario. Notwithstanding this support, the views expressed are the views of the author(s), and Waste Diversion Ontario and Stewardship Ontario accept no responsibility for these views.

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## 1.0 INTRODUCTION AND PURPOSE OF REVIEW

Strong Township (Strong) is a rural municipality of approximately 1000 households located between Bracebridge and North Bay in the Parry Sound District. Strong operates a depot-based blue box recycling program for its residents in a material recovery facility (MRF) consisting of a coverall-style building. Materials are segregated into bunkers and baled on an as-needed basis prior to shipping. Strong also permits the 280 residents from neighbouring Joly Township (Joly) to drop off recyclables at its MRF. All future references to the Strong MRF are deemed to include Joly residents as well.

The blue box recycling program in Ontario is in the midst of major legislative changes which will ultimately shift full program responsibility from the municipalities to designated paper and packaging brand holders (brand holders). Under the current program (Waste Diversion Act), municipalities have full autonomy to operate their blue box recycling program as they see fit and up to 50% of net program costs are reimbursed by brand holders in the form of funding through Waste Diversion Ontario.

New legislation was passed this year which will repeal the current Waste Diversion Act. While final implementation details have yet to be finalized by the Province of Ontario, brand holders will have responsibility for setting up their own diversion programs and as such will control the nature and locations for processing and marketing recyclables within a few years. Municipalities like Strong will be removed from operational decision making for blue box recycling unless they elect to continue to operate their recycling programs at their own cost. This change will have serious consequences to Strong's mill rate.

The Continuous Improvement Fund (CIF), in cooperation with Strong, retained Archibald Engineering to review possible options for Strong to optimize its MRF operations in advance of the blue box program takeover by the brand holders. The rationale in completing a review at this time is to identify program changes necessary which may persuade brand holders to continue to fund local operations after transition to the new legislation occurs.

## 2.0 EXISTING PROGRAM DETAILS

Strong does not operate any curbside or other collection programs and all materials are received at its MRF. Strong has extensive hours of operation with the MRF open 7 days a week all year. The MRF is open 8 hours a day in the summer and 7 hours a day in the winter.

The MRF is a modern facility with a newer coverall-style building with concrete foundations and bunkers, and a small baler. The building is approximately 20 metres by 35 metres in size and has a drive-through arrangement to permit residents to easily enter and exit the facility. Township staff assist with material sorting and bale materials on an as-needed basis. Contamination levels are reported to be low due to this high level of oversight.

Once sufficient quantities of market-ready materials are prepared, Strong's contractor WasteLogix arranges for shipping and sale of the materials and pays Strong a rebate based on market prices. The rebate is lower than typical market prices as shipping and handling costs and brokerage fees have been subtracted to account for WasteLogix expenses. Additionally, the small quantities shipped do not command the same prices larger recycling operations can negotiate with prospective buyers.

Tonnage and financial details presented below may be rounded for clarity. This review is intended to provide local decision makers with a broad assessment and not a detailed accounting. The following details have been obtained from Strong staff, its contractor, and the most recent 2014 WDO data call.

	<b><u>2014</u></b>
Total Tonnage	102
Program Costs	\$118,000
Revenue from Sales	<u>\$7,400</u>
Total Net Cost	\$110,600
Net Cost per Tonne	\$1083

The summary above clearly shows that revenue from the sale of recyclables covers a relatively small portion of the total program costs. Additional tonnage will result in net new costs. The cost per tonne may decrease slightly with additional tonnage if there are no increased staffing or other costs added.

Funding from WDO has typically been on the order of \$40,000 per year but is not shown since the current funding model will end under the new legislation. This review is intended to assess MRF operations and costs independent of WDO funding in light of the fact that this funding will not be available in the future.

At approximately \$1000 per tonne net cost for the program, Strong has one of the most expensive processing facilities in the province. Part of the reported program costs is interest on debt (\$8400) related to construction of the MRF building. Strong's costs compared to similar rural depot operations as reported in the 2014 WDO datacall is summarized below.

<b><u>Municipality/Group</u></b>	<b><u>WDO Reported Net Cost/Tonne(2014)</u></b>
Strong	\$1083
Northern Rural Depots	\$701 (weighted average)
Southern Rural Depots	\$493 (weighted average)

Existing MRF operations include separate handling of old corrugated cardboard (OCC), old newsprint (ONP), aluminum cans, plastics and steel cans.

On a tonnage basis, OCC and ONP represent well over 80% of all material collected and generate 70% of the total revenue received on an average annual basis. While aluminum has a high sale value per tonne, Strong generates an average of only 2 tonnes per year equating to \$2000 in annual revenue.

This breakdown in tonnage and revenue by material type is an important consideration when evaluating opportunities for system optimization.

### 3.0 POTENTIAL OPTIONS TO OPTIMIZE MRF OPERATIONS

While there are numerous possibilities for optimizing MRF operations in Strong, it is recognized that the options to be evaluated must be readily implementable given the short time frame before program responsibility shifts to the brand holders. The following list of options is by no means exhaustive and other possibilities may present themselves in the future. The status quo option (existing operation) will be carried forward throughout this review for comparison purposes, and to provide a general indication to Strong staff of the potential impact to the municipality if brand holders implement a program change in the future.

A key factor across the province affecting the optimal level of sorting at the curb or depot, and in MRFs, is the chronically low revenue generated from the complete basket of materials recovered. Historically, a four-stream sort at the curb and extensive further sorting at MRFs yielded overall financial gains as the improved quality would greatly increase the market value of the products. For example, municipalities would often sort plastics into five or more marketable streams. Today's low commodity prices rarely justify this level of effort except in the largest operations in the province. Even though the individual components of a baled mix of #1 to #7 plastics can have significant market value, the cost of handling and sorting is typically far in excess of the additional revenue generated from the separated streams. Increasingly, municipalities are shipping unsorted blue box recyclables to very large specialized facilities for processing where investments in automation can be justified.

While it may be counterintuitive to reduce sorting to improve net program costs, the data presented in Section 2 shows that in Strong's situation, revenue from the sale of recyclables only covers roughly 10% of the program costs even with well sorted materials. Twenty years ago when commodity prices were significantly higher, spending \$100 on sorting to achieve an incremental gain of \$200 in revenue made sense. Commodity prices will rise and fall over time, but the likely scenario on a go-forward basis is that there is no point in spending \$100 on sorting to gain \$50 in sales revenue. Packaging is also becoming more complex which requires specialized equipment to sort.

The foregoing discussion provides a general explanation as to why the current level of sorting at the MRF in Strong is not retained for every option. In Ontario, labour and handling costs have driven the economic breakeven point for additional sorting to only the very largest facilities (100,000 tonnes/yr) in the province where economies of scale and a high degree of mechanization can justify the additional effort. The following seven options were considered for this review:

1. Status quo (existing operations)
2. Existing operations with reduced hours and staffing
3. Existing operations with Village of Sundridge tonnage
4. Existing operations with Village of Sundridge tonnage and reduced hours/staffing
5. Transfer Strong only (2 stream) with reduced hours/staffing
6. Transfer Strong and Sundridge (2 stream) with reduced hours/staffing
7. Transfer at 500 tonne/yr level with reduced hours/staffing

## 4.0 DEVELOPMENT OF OPTIONS

### 4.1 Option 1 – Status Quo

The status quo option is as presented in Section 2. Based on the 2014 WDO datacall, information costs and revenue are summarized below:

Total cost:	\$118,000
Total revenue:	\$7,400
Net cost:	\$110,600
Net cost per tonne:	\$1,083

The other six options will have costs reported in this same way. For reference purposes the weighted average net cost per tonne for each of the nine Municipal Groups reported in the 2014 WDO datacall are summarized below:

Group 1 – Large Urban	\$289/tonne
Group 2 – Urban Regional	\$203/tonne
Group 3 – Medium Urban	\$198/tonne
Group 4 – Rural Regional	\$322/tonne
Group 5 – Small Urban	\$258/tonne
Group 6 – Rural North w/ coll	\$533/tonne
Group 7 – Rural South w/ coll	\$400/tonne
Group 8 – Rural North Depot	\$701/tonne (includes Strong)
Group 9 – Rural South Depot	\$493/tonne

Strong's 2014 reported costs are almost \$400/tonne more than their group 8 average, and at least double all other group averages.

It is not possible at this time to confirm what level of service fee brand holders will offer to maintain operations in Strong. However, experience with similar programs elsewhere in Canada suggests Strong should not expect to receive much more than \$300/tonne given the availability of lower cost processors within acceptable hauling distances.

The \$300/tonne assumption would result in a \$783/tonne funding shortfall if Strong wished to absorb the cost to maintain its current program structure, assuming brand holders would even consider allowing Strong to continue processing their own material.

If the proposed regulations allow brand holders to redirect residential blue box recyclables elsewhere for processing, Strong will be in a position where budget reductions are necessary to



reflect the elimination of the program from their mandate. Given that a portion of administration, staffing and equipment is factored into the blue box program costs, net reductions of \$80,000 may be required to maintain the current level of taxation.

It is acknowledged that all of the above is speculative, but experience elsewhere suggests it highly likely that brand holders will not provide funding to maintain current operations.

#### 4.2 Option 2 – Existing Operations with Reduced Hours and Staffing

Current staffing costs are estimated to be \$60,000 per year based on existing hours of operation. A 50% reduction in hours of operation should result in a \$30,000 annual labour savings plus some other minor operating savings. These savings may not be immediate if the reduction is managed through attrition.

Strong's current 7-day operation with 49 to 56 hours per week reflects a very high level of service. It is understood that hours match the landfill operations but that too reflects a very high level of service for a smaller community. Opening both the landfill and the depot on 3-4 days per week and for a total of no more than half the current hours should still meet community needs. Given the relatively low tonnage managed, staff should still be able to bale materials as needed within the allotted hours.

Based on 2014 WDO datacall cost, this adjustment would lower net program costs from \$110,000 to \$80,000 and the net cost per tonne from \$1083 to \$785.

#### 4.3 Option 3 – Existing Operations with Sundridge Tonnage

This option presumes that the 50 tonnes of recyclables currently collected in Sundridge is dropped at the depot for sorting. It is assumed that no additional personnel will be required to manage this material over the course of a year and that increased staff productivity will occur.

Increasing 2014 tonnage managed from 102 to 152 will result in only minor cost increases with annual costs expected to be \$120,000. Net costs after revenue from the sale of recyclables would be \$110,000 resulting in a per tonne cost of \$725.

In essence Strong would need to charge Sundridge at least \$725/tonne (\$36,000 per year) to gain from this attempt to achieve economies of scale.

#### 4.4 Option 4 – Existing Operations with Sundridge Tonnage and Reduced Hours/Staffing

This option would reduce costs by \$30,000 as outlined in Option 2, Section 4.2. Therefore, the program cost of \$120,000 for Option 3 would be reduced to \$90,000 under Option 4, with a net cost after the sale of recyclables of \$80,000. The net per tonne cost under Option 4 is projected to be \$530.

Strong would need to charge Sundridge at least \$530/tonne (\$26,500 per year) to gain from this attempt to achieve economies of scale.

#### 4.5 Option 5 – Transfer Strong Only with Reduced Hours and Staffing

This option would continue to utilize the existing building but recyclables would be placed in 40-yard roll-off bins for direct transfer to a larger MRF for processing. Depending on the requirements of the receiving MRF, recyclables would likely require two bins for a fibre stream and a container stream. The baler and bunkers would no longer be required and limited staffing oversight would be necessary.

The most realistic destinations for processing would be existing MRFs in Bracebridge or North Bay. These facilities could supply the bins and provide trucking on an as-needed basis.

Strong would typically generate 80 tonnes of fibre (OCC and ONP) and 20 tonnes of containers. Assuming that 2 tonnes of fibre and 1 tonne of containers can be placed in a single roll-off container, 60 bin movements would be required per year.

Detailed discussions would need to occur with either facility on precise costs for processing but \$100/tonne (processor retains revenue) is considered typical for budgetary purposes. Transport costs are estimated at \$300 per bin movement which would include bin rental. Therefore, total program costs would be as follows:

Processing	100 tonnes at \$100/tonne	\$10,000
Bin Movement	60 @ \$300	\$18,000
Staffing/Misc.		<u>\$20,000</u>
Net Total Annual Cost		\$48,000
Net Cost per Tonne		\$480

#### 4.6 Option 6- Transfer Strong and Sundridge with Reduced Hours and Staffing

The addition of the 50 tonnes from Sundridge would reduce the net cost per tonne slightly but does not make a dramatic difference as the processing and bin movement costs are likely to be unchanged.

Processing	150 tonnes at \$100/tonne	\$15,000
Bin Movement	90 @ \$300	\$27,000
Staffing/Misc.		<u>\$20,000</u>
Net Total Annual Cost		\$62,000
Net Cost per Tonne		\$413

Strong would need to charge Sundridge at least \$413/tonne (\$20,700 per year) to gain from this attempt to achieve economies of scale.

#### 4.7 Option 7 - Transfer at 500 tonne/yr Level with Reduced Hours/Staffing

Option 7 presents a concept where Strong would serve as a centralized collection point for municipalities similarly distant from North Bay or Bracebridge. The 500 tonne value was selected for illustrative purposes on the potential efficiencies gained from a larger transfer operation.

Processing	500 tonnes at \$100/tonne	\$50,000
Bin Movement	300 @ \$300	\$90,000
Staffing/Misc.		<u>\$50,000</u>
Net Total Annual Cost		\$190,000
Net Cost per Tonne		\$380

Strong would need to charge participating municipalities at least \$380/tonne to gain from this attempt to achieve economies of scale. It is possible that processing and bin movement cost may be slightly lower for a larger tonnage amount, but the rates have not been altered as the reductions may be minor. Installation of compactor units would further reduce the cost per tonne provided commitments to participation would justify the capital expense.

## 5.0 EVALUATION OF OPTIONS

### 5.1 Net Cost per Tonne Summary

Net cost per tonne estimates for the seven options under consideration are presented below. As previously stated, this review is intended to provide guidance on relative costs to assist Strong in part, in determining whether program changes are deemed beneficial.

Option 1 - Status quo (existing operations)	\$1083/tonne
Option 2 - Existing ops with reduced hours and staffing	\$785/tonne
Option 3 - Existing ops w/ Sundridge tonnage	\$725/tonne
Option 4 - Existing ops w/ Sundridge tonnage and reduced hours	\$530/tonne
Option 5 - Transfer Strong only with reduced hours/staffing	\$480/tonne
Option 6 - Transfer Strong/Sundridge with reduced hours/staffing	\$413/tonne
Option 7 - Transfer at 500 tonne/yr with reduced hours/staffing	\$380/tonne

Cost alone is not necessarily the only factor in determining the preferred program for a municipality. Community acceptance, transition challenges and risks are also important considerations before making a final determination. These issues are discussed in the following sections.

### 5.2 Community Acceptance of Change in Hours

Current hours of operation at both the MRF and landfill are considered excessive given the level of activity. Similar municipalities typically have half or less of the operating hours compared to Strong. This change would require an adjustment by residents and some negative feedback may be encountered, but given the potential cost savings of up to \$300/tonne for recyclables it is difficult to justify the current hours of operation. In time it is anticipated that the community would adjust to the new operating hours.

### 5.3 Transition Challenges

The first four options are considered easily implementable as only the cooperation and participation by Sundridge is required. Strong would continue to control all operations and processing and marketing approach would be unchanged. Required staffing changes could be phased in over a period of time.

Transfer options 5 and 6 would present more transition challenges as these options would represent a fundamental change in operating approach. While the change would not significantly affect residents dropping materials, Strong would be required to commit to a permanent adjustment of staffing levels as limited oversight would be required. Strong would also need to negotiate and execute a long-term contract with the chosen hauler/processor. The

existing building would still serve a beneficial purpose but the baler would no longer be required and could be sold.

Transfer option 7 is the most difficult to implement as numerous arrangements with neighbouring municipalities would be required in addition to the challenges associated with transfer options 6 and 7. A preliminary round of inquiries from Strong staff may reveal the level of participation that could reasonably be expected.

#### 5.4 Relative Risk of Options

The first four options are relatively low risk as the only potential challenge is the relationship with Sundridge. Provided Sundridge is a willing participant and a long-term (5-10 year) arrangement is signed, risks are considered manageable and reasonable given the potential cost benefits.

The 3 transfer options have a moderate but manageable risk as a long-term contract (5-10 year) would be preferred to provide cost and program stability to Strong and other participating municipalities. Multiple processors within a reasonable distance reduces processing risk.

Option 7 would have the highest level of complexity as ongoing participation by all municipalities would be required. Given the limited administration staff resources at Strong, coordination of this program may be onerous.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

Strong's 7-day a week operation for both the MRF and adjacent landfill is a major impediment to achieving reasonable program costs. It is recognized that staff perform tasks at both the MRF and the landfill during a single shift. This level of service is not warranted based on the level of activity at either the landfill or depot and is far in excess of community needs. A three or four-day operation with less than 50% of the current operating hours is recommended regardless as to whether any other change is implemented at the MRF. This modification alone would reduce the \$1083 recycling net cost per tonne by \$300.

A cooperative arrangement with Sundridge also has the potential to achieve major savings. Both option 4 at \$530 net cost per tonne and option 6 at \$413 net cost per tonne would reduce current cost by half.

While option 7 has the lowest potential cost, the coordination and administration demands of this approach would cause this option to be ranked lower than options 4 and 6.

Therefore, it is recommended that Strong consider options 4 and 6 to reduce program costs by half.