CIF - Project #631.2

Halton Regional Waste Management

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Project Name:
MRF Upgrades for Plastics – Optical Sort

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Date:
October 15, 2018

Executive Summary

In the Spring of 2008, the Region of Halton implemented once a week curbside collection of Blue Box recyclable material and Source Separated Organics (Green Cart), and once every other week collection of garbage. To support the new waste collection services, the Region also entered into a six-year contract agreement with Emterra Environmental Limited to process and market recyclable material.

In the Fall of 2011, Region Council approved the 2012-2016 Solid Waste Management Strategy which identified expanded Blue Box materials as one of the key initiatives. As a result, commencing April 1 2013, the Region introduced Mixed Plastics (#3- #7) into the Blue Box program and over a period of several months distributed larger and taller Blue Boxes to provide more space for these materials and undertook an enhanced Promotioin and Education campaign to encourage the placement of Mixed Plastics into the Blue Box.

Targeting Mixed Plastics provided the Region with the opportunity to improve revenues, diversion and reduce operating costs related to landfilling residual materials, in addition to aligning their Blue Box program with those of neighboring municipalities in the Greater Toronto Area. To support the capture of these materials at the MRF, the Region extended their agreement with Emterra Environmental Limited an additional four (4) years (through to March 31, 2018). In order to efficiently process Mixed Plastics, Emterra Environmental Limited purchased and installed a dual eject Titech Autosort optical sorter and completed site upgrades at their Burlington facility. Financial support for this purchase was received through the Region's application to the CIF under project #631.2.

In January of 2013, Emterra Environmental Limited began the process of installing the dual eject Titech optical sorter that commenced operation in April of 2013 which coincided with the Region's expanded program, blue box distribution, and related P&E campaign. The costs to complete the installation of the optical sort station and enhanced P&E campaign amounted to $1,100,000, approximately $100,000 under budget due to efficiencies in the installation, commissioning and training process.

The Region was successful in collecting, processing and marketing #3 - #7 plastics over the extension of the contract, marketing more than 7,000 tonnes of this material and receiving approximately $420,000 in revenues from sales. Further, the new optical sort equipment was instrumental in improving residual rates, as the Region was able to decrease the amount of these materials sent to landfill from 11% to 8% of collected tonnes. An additional benefit of the new program was the ability of the optical sorter to improve the capture of other materials, namely aseptic and polycoat containers, which further decreased residual and improved revenues for the Region by tens of thousands of dollars.

Region staff is pleased with the results of this investment and would like to extend their thanks to the Continuous Improvement Fund for financial and technical support in completing the project.

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1. BACKGROUND INFORMATION

1.1 Municipal Information

The Regional Municipality of Halton is responsible for administering and delivering an integrated solid waste management program and service to over 550,000 residents. Halton consists of the City of Burlington, the Town of Halton Hills, the Town of Milton and the Town of Oakville.

2016 Datacall

Blue Box Tonnes Collected	47,388
Blue Box Program Net Cost	$7,628,255
Net Cost / Tonne	$160.97
All Waste Management Related Annual P & E Budget	$652,866
Blue Box Specific Annual P % E Budget	$200,372

Halton Region continues to be one of the fastest growing communities in the province with the majority of growth occurring in south Milton and north Oakville. Blue Box and Green Cart material are off-loaded at the Norjohn Transfer Station (Burlington), the Leferink Transfer Station (Georgetown) and the Halton Waste Management Site Transfer Station (Milton). From these locations the Blue Box material is transported to the Emterra MRF located in the City of Burlington.

Audits of material being placed in the Blue Box for curbside collection showed an increasing amount of Mixed Plastics (#3 - #7). As this material was not identified as solicited Blue Box material it was included as residual waste. In 2011, the Region developed the next five-year Solid Waste Management Strategy to incorporate key initiatives that would further increase diversion and expand the landfill lifespan. As a result, the 2012-2016 Solid Waste Management Strategy identified expansion of Blue Box materials and enhanced Blue Box capacity as a key initiative. By expanding the Blue Box to include Mixed Plastics, the Region would reduce the amount of residual waste in the Blue Box, increase diversion from landfill and also receive 25% of the revenue earned from the sale and marketing of Mixed Plastics material.

In order to include Mixed Plastics in Halton's Blue Box program, Emterra Environmental Limited purchased an Autosort optical sorter manufactured by TiTech. In order to recover a portion of the cost to purchase and install the TiTech Autosort optical sorter, the Region negotiated a contract extension with Emterra. The previous contract term was from April 2008 to March 2014 and under the re-negotiated agreement was extended to March 31, 2018. The Region also applied for and received funding support from the Continuous Improvement Fund under CIF project #631.2.

To promote and encourage residents to place Mixed Plastics in their Blue Boxes, the Region undertook an enhanced Promotion and Education campaign that also included the distribution at no charge, of a larger and taller 22 gallon Blue Box (previous Blue Box capacity was 18 gallons).

1.2 Project Description

The Region of Halton commenced negotiations with Emterra Environmental Limited in the late Spring of 2012 to include Mixed Plastics and extend the contract agreement. During negotiations, the Region took the opportunity to add materials, such as empty paint cans and spiralbound cardboard containers, to the list of solicited Blue Box materials. Further to this, in alignment with the approved 2012-2016 Solid Waste Management Strategy, the Region developed a 3 bag garbage limit and garbage bag tag program for bags over the 3 bag limit (3 untagged, 3 tagged maximum).

Upon completion of successful negotiations with Emterra, the Region received Council approval to include Mixed Plastics, empty paint cans and spiral bound cardboard containers, and a contract extension with Emterra. The Region then prepared and implemented a Promotion and Education campaign. The Region began the process of informing residents that commencing April 1, 2013 Mixed Plastics could be placed in the Blue Box. In March of 2013 and August 2013 Blue Boxes were distributed to residents that included an information kit with details on the list of material now accepted in Halton's Blue Box program. The annual Waste Collection Calendar, mailed to all households in Halton also informed residents of the inclusion of Mixed Plastics in the Blue Box.

In January of 2013, Emterra Environmental Limited began the process of installing the dual eject Titech optical sorter that commenced operation in April of 2013. The Emterra MRF receives Blue Box material Monday through Friday (including Saturday following a holiday). The MRF effectively separates various recyclable material into their respective commodities. Emterra as per our agreement markets these materials to respective buyers. Revenue earned from the sale of recyclable material is divided with the Region receiving 25% of all revenue earned.

The inclusion of Mixed Plastics to reduce the amount of residual material sent to landfill in the range of 2% to 4% therefore reducing disposal costs (split 50/50 between the Region and Emterra), and increase revenue. This also allowed the Region to align our Blue Box program more closely with other municipalities, therefore reducing confusion among residents about what is and what is not acceptable recyclable material.

Figure 1: New Solicited Materials in Blue Box

2 IMPLEMENTATION

2.1 Goals and Objectives

1. Increase Diversion from Landfill
    - By including Mixed Plastics in the Blue Box, the Region would be able to divert more material from landfill therefore expanding its lifespan.

2. Increase Revenue earned from the sale of Mixed Plastics
    - As more market reliability for Mixed Plastics evolved, the opportunity to increase revenue was achievable.
    - Adding Mixed Plastics to the Blue Box program also reduced residual waste quantities therefore saving disposal costs.

3. Align Halton's Blue Box program more closely with other Municipalities
    - Halton's close proximity to the City of Hamilton, Region of Peel and City of Toronto leads to some confusion over what is and what is not accepted in the Blue Box as not all municipal recycling programs are aligned. By including Mixed Plastics some of the confusion is eliminated.

4. Minimize impact on operational budget
    - Any impact on costs to process recyclable material is off-set by cost savings as a result of revenue earned and decrease in landfill disposal costs.

2.2 Implementation Schedule

- Region Council Approval of 2012-2016 Solid Waste Management Strategy: November 2011 (PWE01-09)

- Continuous Improvement Fund committee approves funding to upgrade Halton's Blue Box program to include Mixed Plastics: May 2012

- Contract Negotiation for the Inclusion of Mixed Plastics in the Blue Box program: June 2012 – August 2012

- Region Council approval of 22 gallon Blue Box: September 2012 (PW-65-12)

- Region Council approval of Contract Extension (original agreement expired in March 2014 and a contract extension was approved in September 2012): September 2012 (PW-70-12)

- Council approval of Communication Plan: November 2012 (PW-75-12)

- Purchase and Installation of Titech Autosort Equipment: August 2012 – March 2013

- Full-time Operation of Titech Autosort Equipment: April 2013

2.3 Budget

The budget for the project as identified in the funding agreement is shown in table below:

Table 1: CIF Project #631.2 Budget.

Project Task	Notes	Estimated Cost
Purchase of: TITECH Optical Auto Sort (Sept 2012 – January 2013)	Upon Council approval for the inclusion of mixed plastics in the Blue Box program, equipment will be ordered with an estimated deliver time of 4 to 4 ½ months.	$815,690
Installation and Training (Feb 2013 – March 2013)	Installation is estimated to require 6 weeks followed by a two week training period.	$244,310
Promotion and Education (January 2013 – April 2013)	Region will prepare and implement a communication plan via the 2013 Waste Management Guide and Collection Calendar, PSA's, WasteLess Newsletter.	$160,000
TOTAL		**$1,220,000**

At the time of Region Council approval of the inclusion of Mixed Plastics in the Blue Box and extension of contract agreement with Emterra Environmental, the estimated annual cost to process and market recyclable material would be $1,330,000. This represented an estimated annual increase of $33,000.

Approximately $175,000 of this amount was dedicated to the Promotion and Education campaign with the remainder allocated to the optical sorter installation.

Figure 2: Example "What's New in Blue" campaign.

3 RESULTS

3.1 Tracking Project Results

3.1.1 Mixed Plastics Diversion and Sales Revenues

To determine the impact and benefit of including Mixed Plastics, the supporting improvements at the MRF, and Promotion and Education campaign, the Region and Emterra reviewed the annual tonnes of mixed plastics marketed and revenues from the sale of these materials.

Table 2: Tonnes of Mixed Plastics

Year	TOTAL TONNES
2013	914.46
2014	1,506.49
2015	1,551.41
2016	1,373.45
2017	1,680.35
Total	**7,026.16**

Table 3: Annual Revenue Earned

Year	TOTAL REVENUE
2013	$20,355.88
2014	$100,452.75
2015	$140,464.66
2016	$92,996.30
2017	$67,986.96
Total	**$422,256.55**

Over the extension period of the contract, the Region was able to divert more than 7,000 tonnes of mixed #3 - #7 plastics from landfill to end markets and received over $400,000 in revenues from the sale of these materials.

3.1.2 Program Operating Costs

The Region estimated an increase to the annual budget for the processing and marketing of recyclable material due to a change to the Unit Price per Tonne for processing. The Region had negotiated only a modest increase in the per tonne rate charged for processing services which would serve to moderate this change to some degree.

Some of the increase would be off-set by increased revenue earned from the sale of recyclable material, along with a decrease in the amount of residual waste to be disposed as garbage. Table 4 on the following page details the processing costs, the Region's share of revenues from the sale of Blue Box materials, and costs of residual waste disposal over the term of the contract extension with Emterra.

Table 4: Operation Costs (Actual)

Processing Fee	Annual Tonnes	Total Processing Cost	
2013	47,564	$1,251,832	
2014	45,040	$1,284,780	
2015	46,255	$1,261,749	
2016	47,059	$1,323,046	
2017	48,747	$1,334,441	
		TOTAL	**$6,455,848**
Revenue	Annual Tonnes	Total Region Revenue	
2013	42,907	$1,125,860	
2014	40,931	$1,137,501	
2015	42,471	$1,201,553	
2016	43,334	$1,319,278	
2017	44,418	$1,519,273	
		TOTAL	**$6,303,465**
Residual Waste Disposal	Annual Tonnes	Total Disposal Cost	
2013	4,657	$147,000	
2014	4,108	$129,400	
2015	3,783	$119,170	
2016	3,725	$117,340	
2017	4,328	$136,350	
		TOTAL	**$649,260**
TOTAL OPERATING COSTS			**$801,643**

3.2 Analysis of Project

The inclusion of Mixed Plastics in the Region of Halton's Blue Box program has proven to be advantageous:

1/ Halton was able to increase the amount of material to be included as acceptable recyclable material. This change made it easier on residents by reducing confusion on what is and what is not recyclable and promoted waste diversion and extended lifespan of the Halton Waste Management Site. The diversion of #3-#7 plastics resulted in approximately 1,700 tonnes of this material now entering end markets and avoiding landfill.

2/ The amount of residual material disposed as garbage decreased. While the Region has traditionally enjoyed a low residual rate, the inclusion of Mixed Plastics achieved a reduction in tonnes of material disposed as residual waste. Residual rate decreased from approximately 11% to 8% preventing more than 1,000 tonnes of waste from entering landfill.

3/ With this dual eject TITECH Autosort optical sorter installed, we participated in numerous pilot studies with Halton Region, Stewardship Ontario (SO), the Carton Council of Canada and Tim Horton's to understand the capabilities of using this type of technology to efficiently and effectively recover hot beverage cups.

After several years of studies, the results of the studies, which were also conducted at a few other Ontario material recovery facilities, demonstrate:

- Increased capture rates of polycoat cups within pilot communities by 22 per cent.
- Tested and proven new MRF optical sorting technology that captures 90 per cent of polycoat cups without compromising the commodity output.
- Identified stable markets for processing polycoat cups in North America and overseas.

Figure 3: New Optical Sort Equipment

4/ Poly-laminated paper hot beverage cups are a valuable source of high quality paper fibre. It has been an industry challenge to efficiently and effectively capture this material through manual sorting. As the optical sorter Emterra selected was a dual eject TITECH Autosort 4, we were able to program that unit to sort for polycoat and aseptic containers as well.

From January to March 2013, the average recovery rate for these materials was 0.27%. For the nine months from April to December 2013, the average recovery rate tripled to 0.65%. The recovery rate remained fairly consistent for the remainder of the contract to April 2018, recovering approximately 325 tonnes of this material annually.

4 Conclusions

The implementation of #3 - #7 plastics into the Region of Halton's Blue Box program was made possible by progressive Council support, a strong business case with a reasonable payback period and increased potential for revenue, and the willingness of Emterra Environmental Ltd. to incorporate new opportunities, marketable materials, and negotiate fairly.

The success of the Region's expanded list of Blue Box program materials is well demonstrated by the improvements in diversion, revenues, and residual materials sent to landfill. Targeting #3 - #7 plastics partnered the Region with neighboring municipalities in the GTA in a step towards harmonizing what does and what does not go in the Blue Box for people living in the area. Unlooked for benefits have been realized as the Region was able to improve the capture and marketing of other materials using the optical sort technology and participate in studies to inform future diversion opportunities. The Region was able to make these changes with relatively minimal impact on operating costs.

The Region is pleased with the results of this investment and would like to extend their thanks to the Continuous Improvement Fund for financial and technical support in completing the project.

Figure 4: Optical Sort Station.