Weight in : Kilo 1ton metric= 2204.623 Lbs 600 sec for the test

2010-02-04	Tin		Aluminium		Mixed Paper from Pellenc		HDPE		PET		Tubs Lids		Residue		Mixed Paper		News		Glass		Cardboard		Pre Sort		Rejected			
Material	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	System	Machine	Total System	Total Machine
Tin	108.58	108.58	0	0	0	0	0	0	0	0	0	0	0.88	0.88	0	0	0	0	0	0	0	0	0	0	0	0	109.46	109.46
Aluminium	0.13	0.13	32.79	31.46	0	0	0.05	0.05	0	0.3	0	0	0.29	1.32	0	0	0.42	0.42	0	0	0	0	0	0	0	0	33.68	33.68
Mixed_Paper from Pelle	0	0	0	0	18.19	19.44	0	0	0	0	0	0	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	19.44	19.44
HDPE	0.46	0.46	0	0	0	0	34.7	30.06	0	0	2.48	2.48	0.65	3.85	0	0	0	0	0	0	0	0	0	0	0	1.44	38.29	38.29
PET	0.49	0	0	0	0	0	0.2	0.2	69.68	62.32	0	0	0.21	4.57	0	0	0.4	0	0	0	0	0	0	0	0	3.89	70.98	70.98
Tubs_Lids	0	0	0	0	0	0	2.14	2.14	0	0	7.07	5.72	0	1.35	0	0	0	0	0	0	0	0	0	0	0	0	9.21	9.21
Residue	1.3	1.3	0.18	0.18	0.64	0.81	0.67	0.67	0.68	1.28	0	0	39.67	25.51	0.96	4.6	2.39	8.24	0	0	1.21	5.11	0	0	0	0	47.70	47.70
Mixed_Paper	0	0	0	0	0	0	0	0	1.56	1.56	0	0	31.59	31.59	373.59	301.69	39.68	95.09	0	0	0	16.49	0	0	0	0	446.42	446.42
News	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17	0	611.79	611.96	0	0	0	0	0	0	0	0	611.96	611.96
Glass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	199.32	199.32	0	0	0	0	0	0	199.32	199.32
Cardboard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.78	12.7	27.78	0	0	182.86	150	0	0	0	0	195.56	195.56
Pre_Sort	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65.99	65.99	0	0	65.99	65.99
Rejected	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.42	4.42	4.42	4.42
Bunker Weight	110.96	110.47	32.97	31.64	18.83	20.25	37.76	33.12	71.92	65.46	9.55	8.2	74.54	69.07	374.72	324.07	667.38	743.49	199.32	199.32	184.07	171.6	65.99	65.99	4.42	9.75	1852.43	1852.43
Contaminents	2.38	1.89	0.18	0.18	18.83	0.81	3.06	3.06	2.24	3.14	2.48	2.48	34.87	43.56	1.13	22.38	55.59	131.53	0	0	1.21	21.6	0	0	0	5.33	121.97	235.96
Tons/Hour	0.7	0.7	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.4	0.1	0.0	0.4	0.4	2.2	1.9	4.0	4.5	1.2	1.2	1.1	1.0	0.4	0.4	0.0	0.1	11.11	11.11
Input feed specs	5.91%		1.82%		37.08%		2.07%		3.83%		0.50%		2.57%		24.10%		33.04%		10.76%		10.56%		3.56%		0.24%			
Material Purity	97.86%	98.29%	99.45%	99.43%	98.80%	98.00%	97.56%	97.22%	96.89%	95.20%	74.03%	69.76%	53.22%	36.93%	99.70%	93.09%	91.67%	82.31%	100.00%	100.00%	99.34%	87.41%	100.00%	100.00%	100.00%	45.38%		
efficiency	99.20%	99.20%	97.36%	93.41%	93.57%	100.00%	97.08%	90.01%	98.17%	92.89%	76.76%	62.11%	83.17%	53.48%	63.69%	67.58%	99.97%	100.00%	100.00%	100.00%	93.51%	76.70%	100.00%	100.00%	100.00%	100.00%		

Performance to achieve:

Input feed specs																										
Purity																										
efficiency																										

2.00%	Input feed variation tolerance
0.50%	Purity and Efficiency tolerance

Machinex Tech: ***Guy Légaré***

Machinex ingeneer: ***Serge Beaurivage***

Final Report | 10

Bluewater Recycling Association

Single Stream MRF/Automated Collection Project

Submitted by: Francis Veilleux, President

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1.0 Table of Contents

2.0 Introduction

In accordance with the requirements of the Continuous Improvement Fund Project Agreement #135, this report provides certain information pertaining to the installation of a new single stream processing facility to facility the Association's conversion to a collection system involving the use of automated collection vehicles and wheelie bins instead of the traditional blue box with a manual collection system.

This report is divided into three sections:

1) MRF Construction and Monitoring
2) MRF Operations
3) Curbside Collection Monitoring

This is the final report of four amalgamated quarterly reports.

3.0 MRF Construction and Monitoring

3.1 Project Schedule

Task	Scheduled	Completion
Removal of Existing Equipment	October 1-11, 2009	October 8, 2009
Installation of New Equipment	Oct. 12- Nov. 30, 2009	December 1, 2009
Start up	December 1, 2009	December 2, 2009
Commissioning	January 2010	February 4, 2010

The Association completed the removal of existing equipment ahead of schedule with the cooperation of the weather and the availability of the right trades persons.

An unplanned electrical service upgrade was completed during the equipment installation to facilitate the new installation.

The installation was slow at first with some of the equipment being delayed at the factory but once everything was rolling Machinex Industries delivered the facility on time and on budget as promised. We delayed the completion by 24 hours to make various minor adjustments in chutes, platforms, and railings that were deemed preferable for long term operating efficiency.

While the final commissioning was originally scheduled for January, we jointly agreed that our staff needed to get over the holiday rush and learn the system better before commissioning. As a result it was moved to the week of February 1, 2010 and it was completed successfully on the first try.

3.2 Project Budget

Item	Budget	Actual
Equipment Removal	$70,000	$62,646
Concrete Work	60,000	53,921
Receiving Modification	72,500	74,095
Electrical Provision	40,000	212,560
Miscellaneous	100,000	32,574
Mechanical Equipment	732,755	732,755
Structural Steel	380,495	380,495
Screens	312,000	312,000
Pre-sort Residue Compactor	46,040	46,040
Mix Paper Optical System	359,415	359,415
Fiber Storage	60,375	60,375
Container Sorting System	816,680	816,680
Container Storage	96,085	96,085
Glass Cleanup System	210,755	210,755
Installation	875,290	875,290
Freight & Commissioning	107,640	107,640
Total	**$4,340,030**	**$4,433,326**
Difference		***$93,296***

The Machinex installation was delivered on time and on budget.

The Association did have some unexpected electrical services upgrades to complete for the project to proceed. These new services added $180,000 to the project costs which were the sole contributor to an overall extra expenditure over budget of $93,296.

4.0 MRF Operations

4.1 Labour Requirements

During the initial start up we used 15 sorters supported by 4 operators. During the first three months we studied the productivity of each position and assessed the quality of the outgoing materials to find the right number of sorters at the right locations in the process to optimize quality and throughput.

We are currently operating with 12 material handlers and 4 equipment operators. We do not anticipate making any significant changes to this allocation until we have enough materials to fill a complete shift.

The Association anticipated labour costs savings of up to 50% with the new system. We are currently running with approximately the same number of staff as before but we typically run out of materials after approximately 6 hours of production time in lieu of the original eight hours in the winter and 10 hours in the summer.

In order to keep the existing staff we have made it optional for anyone to leave in the afternoon to guarantee some base income. Approximately half the employees usually leave, the remaining employees are used to sort e-waste, perform general housekeeping duties around the facility or assist with odd jobs that occur from time to time. There is also additional baling that needs to be done.

4.2 Processing Costs

In order to provide some financial performance for comparison purposes, the second quarter of 2009 is compared with the second quarter of 2010.

Item	2009	2010
Wages	156,021	174,801
Equipment Repair & Maintenance	12,175	151,067
Disposal	11,215	10,487
Supplies(including bale wire)	44,864	42,370
Utilities	12,826	26,742
Building Repairs & Maintenance	34,225	36,598
Total Processing Costs	**271,326**	**447,065**

Wages are higher in 2010 due to the addition of an apprentice millwright who will return to school in September and a driver who was in the plant on modified work as part of his return to work plan. Otherwise we ran with 12 sorters, same as 2009. Hours were previously discussed under MRF Operations.

Equipment repairs in 2010 include a one time purchase of essential parts from Machinex of $118,000 for the new equipment.

Residue rates for the 2nd quarter were 5.27%, virtually unchanged from 2009 at 5.32%. Since the recovery of plastic film has resumed and the addition of mixed rigid plastic to the program, residue rates have steadily fallen below 4%.

We have seen a large increase in our hydro costs due mostly to the increase in demand that the new equipment requires. Through CIF funding we will be conducting an energy audit to see where we can improve.

4.3 Problem Areas

Like any new process implemented, a variety of side effects manifests themselves which are sometimes positives and other times problematic where system adjustments are needed. Here is a sample of some areas we have had to deal with.

4.3.1 Large OCC

Because of the 90 degree turn at the beginning of the system, the transition that allows the materials to spread evenly onto the presort conveyor initially caused some issues with excessively large cardboard boxes such as "Gaylord" boxes which would rest on the transition and block the incoming flow. A simple tool has been developed for the presort staff to give the boxes a tug when needed to allow them to flow freely.

4.3.2 Paper Labels and Small Paper

As part of the "container" processing area we use an optical machine to sort containers as well as any mixed paper that is with the containers. The optical sorter does not know or care about the source of paper. You can simply program it to identify and eject paper and the size of the piece of paper you wish to eject. If the smallest size is selected, most of the paper is removed along with any containers with a "paper" label. As the target size is adjusted to ignore paper labels found on water bottles, detergent bottles, etc so are the smaller pieces of paper resulting in unwanted residue. The machine can be effective in removing paper contaminants but the exercise really comes down to the best compromise between size recovered and excessive contamination. We are currently evaluating options to possibly utilize our second optical sorter in the cleanup task.

4.3.3 Film in Paper with AB21

As part of our mixed fibre cleaning system we use an optical machine to remove non paper contaminants. The system is effective in removing the majority of contaminants along with any paper that may have been overlapping at the time of ejection. For that reason, we designed a vaccum system to recover the fibres that are erroneously ejected. The system is very effective at recovering the lost fibres unfortunately it was recovering the ejected plastic bags also that were missed on presort and returning them to the clean mixed fibre storage bunker. After some system process reviews we opted to stop the optical system from removing PE resins and let our quality control person handle those instead.

4.3.4 S12 Transition

The transition at the end of the finishing screen is tapered for unknown reason. The result has been a build up of materials on the ledge that eventually gets dragged in with the fines that fell through the screen. Since our fines cleaning system rejects anything larger than two inches, some paper was found in the glass system residue that did not belong there. As part of our operating procedure, we now clean the ledge area on a regular basis until the transition can be modified to eliminate the issue.

4.3.5 S4 Spill

We have observed the cardboard separator to be very aggressive from time to time on all containers resulting in the ejection of some containers over the side of the unit. The top of the separator will be covered in mesh to prevent any further spillage.

4.3.6 S4 Disk Spacing

Just as the largest cardboard caused some issues with the feed system, the smallest cardboard escaped the cardboard separator screen. After an adjustment to the disk spacing, we have found the vast majority of all cardboard is removed by the screen without any quality issues after the quality control position.

4.3.7 Film Recovery

Our new system design purposely left plastic film with different options since the material was in decline with all the new fees in grocery stores and we were not convinced that the quality of the film in a single stream system would be acceptable to end markets. Until recently, we simply disposed of the film with any contaminant removed at the presort area.

We now use the compactor at the presort to hold the film recovered and only remove damaging contaminant at the presort. The change allows to store film for up to 50 hours of production in the compactor before being brought in to be baled. The contaminants are deposited in one of two 6 yard front end containers that are replaced once per day.

4.3.8 OCC QC Position

We have had to increase the size of the chute for materials being returned on the line by the OCC QC position since we reduced the disk spacing. We are now getting more large plastic containers and some newspaper that must be returned to the processing line but the chute was too narrow resulting in some unnecessary plugging.

4.3.9 Fines Magnet

The overhead magnet on the fines processing line has been very effective in removing ferrous lids from the fines. However, some of those lids have been accumulating on the side of the permanent magnet affecting the belt tracking. We have since raised the receiving side of the magnet forcing the material to hit the belt in the center instead of the side.

4.3.10 Baler Efficiency

The Association utilizes a 10 year old Ambaco 7243 horizontal baler to bale all of its materials. Building limitations also limited the width of the belt feeding it to 48 inches.

The baler was not replaced as part of the upgrade to test its efficiency with the new system. It was hoped that the new single stream system would agitate the paper enough that fluffers would no longer be needed for normal operation greatly improving the efficiency of the baler.

The baler is capable of adequately baling paper without fluffers however bale weights are reduced by approximately 20%. This is not critical for paper as paper shipments are usually overweight and they never cube out. However, the reduced bale weight is affecting the density of other materials such as plastic and metal in a negative way. As a result, we are required to use the fluffers to maintain our pressure which greatly reduces the efficiency of the baler.

With the speed of the new system and the limited storage capacity, we are required to alternate between paper and plastic or metal after every two bales to maintain our pressure losing and productive advantage a single ram baler of this design can offer us.

The only baler types capable of baling any material without worries about the last material baled are those baling against a solid surface like a closed ram baler or a two ram baler. Closed ram balers are not suitable for operations our size because of throughput limitations. Two ram balers are generally slower that a single ram baler and only a few machines can handle our throughput potential.

A new two ram baler has been ordered to manage our mix of materials. Installation of the Harris Grizzly EHD baler is expected to take place in the first quarter of 2011. The new baler employs unique technologies making it capable of twice the throughput of the current baler without the need for any fluffers.

4.3.11 Air Emissions

As part of the new MRF design, the Association replaced its skid steer equipment with a larger telehandler to stack incoming materials higher and reach the drum feeder that feed the whole process line. The receiving area shares a common areas with the processing area. In new constructions, it is common practice to separate the two, but in existing buildings like ours, it is a compromise you have to live with. Because the building is heated, there is no mechanical ventilation.

As a result, we routinely perform air quality tests to ensure the safety of our employees. One of the unexpected results of the equipment change was the rise in diesel particulate matter (DPM) emissions resulting in less than ideal air quality. Air emission standards were surpassed and employees were required to wear masks.

Our immediate reaction was to replace the current coloured diesel fuel to the Ultra Low Sulphur Diesel used in our trucks. We tuned up the equipment and installed a catalytic converter on the telehandler. The results were better, but not good enough. We moved to plan B with 100% biodiesel which is readily available and sustainable in our indoor heated environment. The results were clear and noticeable. Problem solved. All data summarized below.

Item	DPM as Total Carbon	DPM as Elemental Carbon
Standard to be met	160 ug/m3	308 ug/m3
Initial Reading	202-715 ug/m3	253-503 ug/m3
Low Sulphur Diesel Approach	234-519 ug/m3	115-346 ug/m3
B100 Biodiesel Approach	32-119 ug/m3	6-15 ug/m3

4.3.12 Plastic Quality Control Conveyor Speed

The Association uses one conveyor to perform quality control on PET and HDPE that are fed in a batch process. Three conveyors operated on time delay are used to evenly distribute the materials to maximize the efficiency of the optical secondary quality control pass while providing an even flow for the material handler to effectively finish the sort. Only one adjustment was available on the system initially. With the help of Machinex, a second adjustment is now possible to differentiate between PET and HDPE as they flow differently on the conveyor.

4.3.13 Large Paper Handling on Glass Cleanup System

The glass cleanup system was designed to handle all materials of a 2" minus nature. We have found that some paper larger than 2" is often found in the glass system in small quantities. This material makes up the majority of the material found in the compactor at the end of the line. The pieces of paper are sometimes long and skinny explaining why they went through the screens, other times they are larger and were found in the mix because of overflows from other sources. Despite the low generation, 30 cubic yards per month, we are now reprocessing this material successfully rather than shipping it to landfill. The recovery is very high if the loader operator blends it properly with fresh materials.

4.3.14 Static Electricity Nuissance

Since the new system was installed, complaints of static electricity shocks were filed by employees in the presort area. Those varied based on the time of the year and humidity in the air. We discovered the source of the problem was the drum feeder unit. The drum feeder rotates and holds excess materials back to provide an even constant feed in the system improving material separation. Some materials like plastic bags are more susceptible to building an electrical charge as they rub together. That static electrical charge was not released until our material handlers were handling the bags allowing for the stored energy to be released through their body on to the steel platform that is grounded and the rubber belt was not. While rubber mats and anti static boots helped, it simply transferred the problem to other body parts such as their belly that made contact with various metal components. The solution was a chain curtain installed prior to the presort area to dissipate the stored energy in the bags through the equipment before reaching the material handlers.

4.4 Efficiency and Effectiveness of System

The Association has been operating the facility at approximately 12 tonnes per hour meeting all of the current market demands. Appendix A outlines the details of the system efficiency and effectiveness compared with the equipment efficiency and effectiveness for each commodity managed by the Association.

4.4.1 Plastic Quality Control Secondary Pass Performance

One of the unique characteristics of this facility is the utilization of the largest optical separator in North America to perform multiple functions. The most unique function being a secondary batch process quality control pass. In this report, we publish the results of this approach.

Our 2800mm wide optical separator is separated in three channels, each equipped with two ejection valves capable of ejecting up and down with rejects in the middle for up to nine separations. The channels are distributed into one roughly 1200 mm and two roughly 800 mm each.

The centre channel is the first channel used. Its higher quality upward ejection is used for HDPE bottles while the less efficient downward ejection is used to remove paper from the containers. The remaining materials are sent to an eddy current for aluminum removal prior to returning to the optical sorter.

The second channel located on the left side is used to eject upward the PET containers while plastic containers are downward ejected. The remaining materials are deemed to be residue but not before being inspected by a quality control station to recover any missed materials.

The third channel located on the right side is used to batch process the PET and HDPE to improve their quality before being conveyed to a quality control station. In this channel, only the upward ejection is used to remove contamination since in theory all materials presented are acceptable. The thought process behind this arrangement was that if the machine can achieve a 95% purity level on the first pass, in theory it should be able to achieve a 99.75% purity level with a second pass.

HDPE	First Pass	Second Pass	Overall
Purity	94.6%	96.9%	96.9%
Efficiency	95.4%	94.4%	90.0%

PET	First Pass	Second Pass	Overall
Purity	95.2%	96.2%	96.2%
Efficiency	95.4%	97.4%	92.9%

Net Impact	HDPE	PET
Purity	2.3%	1.0%
Efficiency	-5.4%	-2.5%

The result is the possibility to improve the purity by 1-2% but at the loss of efficiency of 2-5%.

4.5 Maintenance Requirements

Normal preventative maintenance has been performed on the equipment since the start up. It consists of a multitude of daily, weekly and monthly tasks that are scheduled as part of our operations. At this time we are primarily performing maintenance during the afternoon when we run out of material. As the system ages, more time will be needed and a separate shift will be required to completed the necessary work to maintain the equipment.

We initially had some issue with our wide optical system getting out of alignment once per week. It was traced to a defective communications card that was replaced in January. Since then, we have not had to align the machine. We also had a week circuit breaker that caused some alarms on one of the compactors. Both compactors were upgraded to a larger breaker.

4.5.1 Separator Angle Sensor

The new equipment came equipped with new angle sensors that turned out to be so sensitive that they were reading the angle fluctuations from the vibration of the machine. We had to abandon the design and return to the original equipment. The issue did not cause any downtime but it did reduce our abilities to a manual adjustment that had to be monitored instead of allowing the PLC to make automatic adjustment. Material quality would have suffered during that period but to no measurable degree.

4.5.2 Shaft on Accelerator Conveyor

We experienced head and tail shaft failures on the 2.8m wide accelerator conveyor feeding the container optical system. The failure introduced itself as a vibration at first that was suspected to be a material build up on the supporting rollers at first until the tail pulley actually broke in half.

The location of this pulley was very difficult to reach, it also was attached to an air driven automatic tracking system and there were no written procedures to properly replace the shaft. We were successful in fabricating special tools and develop appropriate procedures to extract the broken shaft and install the replacement shaft in 15 hours. The exact cause of the failure is still under investigation.

The head pulley on the same conveyor experienced the same problem but we replaced it before it completely broke. Both pulley have been redesigned by Machinex to prevent re-occurrence in the future.

4.5.3 Optical System Alignment

The optical systems have been performing well but we noticed that they are affected by the temperature. Since our facility is heated, the temperature changes are not as extreme but we did require a new alignment in late spring when the summer heat was constant. The alignment process is not onerous for us as it can be done remotely through our online connection.

4.5.4 Conveyor Tail Pulley Failure

During the third quarter, we had to replace a tail pulley on a narrow conveyor below our container crusher. A bearing failure resulted in a worn shaft that had to be replaced. The bearing was installed backwards which prevented the introduction of grease.

4.5.5 Optical System Purge Valve Failure

Each of our optical systems had the purge valve stick open at some point. In each instance small particles of aluminum from the air lines installation were found to be the cause of the problem. A simple cleaning of the valve resolved the issue.

4.6 Health and Safety

One of the goals of the project was to provide a safer work environment for employees and reduce WSIB claims. The Association has not recorded any lost time injury related to the implementations of this processing system since its implementation.

4.7 Commodity Markets

The Association had two downgrades related to the implementations of this processing system since its implementation. The two downgrades were on two consecutive loads of newspaper sold as #8 News that were downgraded to #6 News. The two loads were the result of an experiment where we ran the system in excess of 18 tonnes per hour with 14 sorters.

Otherwise, we have had no market issues. Buyers for paper, plastic, and glass have visited our facility and they were happy with the quality produced.

The Association has had no downgrades or rejections since the first quarter.

We have started to sell our shredded paper as a separate commodity instead of mixing it with our mixed paper. The value is substantially greater at $249 per tonne in lieu of $27 per tonne for mixed paper.

We have also resumed our separation of plastic film as outlined above without any marketing issues.

4.7.1 Mixed Plastic Programming

As of October 1, we reprogrammed our container optical system to separate all mixed plastic containers in lieu of the #2, 4, and 5 that had been programmed for tubs and lids only. The plastic recovery has increased noticeably, while the residue decreased proportionately.

4.8 Production Capacity

The Association estimated the new facility would be capable of increasing the production capacity by 44% while reducing costs per tonne as a result of economies of scale. The productivity test performed thus far indicate the system is capable of processing up to 15 tonnes per hour. Based on a two shift operation 5 days per week this translates into a facility capable of handling 48,000 tonnes per year or 100% more than the old facility.

As a result, the Association is willing and able to assist other programs wishing to benefit from single stream collection but do not have the processing capacity to do so. We can readily handle more tonnes to process in the system.

5.0 Curbside Collection Monitoring

5.1 Labour and Equipment Costs

The automated collection system has been in place in St. Marys since October 2008. It has maintained its effectiveness and efficiency as documented in earlier reports. Where the manual collection system required 31 hours per week, the automated collection system requires a mere 14.5 hours per week collecting 17% more materials.

The cost to operate and maintain an automated vehicle including the cost of the carts is 40.4% more per hour than a traditional manual top loader collection vehicle. However, because the automated collection vehicle is so much faster per stop, has compaction, and only requires biweekly collection in lieu of weekly collection as a result of the additional capacity the carts give the residents, the automated system results in a net cost that is 34.3% less than the traditional manual top loader system.

One container had to be replaced because of vandalism.

5.2 Curbside Impact

The capture rate is 17% higher than the traditional blue box system.

Other communities have embraced the concept and we have begun the expansion into those communities. The Town of Goderich and the Ward of Seaforth were the next areas benefiting from this program. The Association has distributed 3,026 wheelie bins in Goderich while another 953 were distributed in Seaforth. Their first collections took place in June.

The Municipality of Central Huron is the latest to be converted to the automated collection program. Approximately 4,000 containers were distributed during the first two weeks of November.

The Association has not experienced any collection equipment failure to date.

5.3 Health and Safety Issues

One of the goals of the project was to provide a safer work environment for employees and reduce WSIB claims. The Association has not experienced any lost time related to the implementations of this collection system since its implementation.

5.4 Customer Feedback

The residents of St. Marys continue to accept the new program and embrace its convenience. Twelve more containers were delivered in the last quarter to households and businesses wishing to recycle more.

Resident from Goderich and Seaforth appear to be generally pleased with the system. The local newspaper reports there is rumors of a petition circulating in a hamlet near Seaforth questioning their council why they did not receive the new wheelie bins as they now feel like second class citizens. They want the wheeling bins.

Once the customers receive the containers and use them for three to four months, they appreciate the convenience of the new wheelie bins. The Association expanded its recycling program to include mixed rigid plastic containers starting in October and those with wheelie bins are very happy to have the capacity to manage the new materials. Others with a blue box are asking when they will receive their wheelie bin.

6.0 Lessons Learned

1) Single stream processing technology can be applied to smaller material recovery facilities with competitive capital costs on a per tonne basis.
2) Single stream processing can generate quality materials for end markets.
3) Optical machines can be very effective to assist in the separation of materials but have limitations like most sorting technologies.
4) Current disk separator technology can be used to recover smaller rural papers effectively.
5) Single stream fines can be effectively separated to meet end market requirements to recover glass, metals, and fibres. Plastic lids cannot be easily separated from broken glass without an optical machine.
6) Automated collection is safer than manual collection.
7) Automated collection recovers more than manual collection.
8) Residents prefer the use of the wheelie bins over the traditional blue box.
9) Plastic film can be recovered effectively in a single stream system.
10) Optical machines can be very effective to assist in the separation of materials but they must be maintained at regular intervals.
11) Today's technologies have the ability to be connected to the internet where remote connections can be established by the equipment manufacturer's experts to diagnose quickly and efficiently to minimize downtime and repair costs. All facilities with this level of technology should be remotely accessible.
12) High speed conveyors such as those used to feed optical systems have a higher propensity for shaft failures because of their speed and belt tension. The wider the belt, the higher the propensity.
13) 100% Biodiesel is highly effective in reducing DPM emissions and improving air quality if other operating conditions are conducive to the use of the fuel.
14) A secondary optical pass used for plastic sorting improves the purity of the outgoing materials but not without loosing some system efficiency.
15) Drum feeders are an efficient tool to manage the system material flow but they introduce static electricity to some materials that needs to be managed.

7.0 Appendix A