Final Report: Recycling Equipment Investment

Grant Project: 23-G550-09EMS

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Objective	*Increase recovered recyclable material*
Target	*Increase the recovery of plastic, tin and aluminum by 600 tons/11.4% of the overall inbound*
Baseline	*FY 23: Received a total of 40,531 tons of single stream and captured 4037 tons of HDPE,PET, PP, Tin and Alum: 9.9% of overall tonnage*
Results	*Through the purchase and installation of optical sorters, the Scott Area Recycling Facility has increased the recovery of plastic, tin and aluminum by 574 tons/11.3% of the overall inbound*

Project Summary, Obstacles

The Waste Commission of Scott County Single Stream Recycling Facility had identified an opportunity through its EMS system to significantly increase the amount of recyclables captured and marketed by investing in optical sortation.

Equipment selection was done through a competitive bid process for recycling equipment to capture additional recyclables, increase overall facility capacity and decrease the facility's reliance on human sorters. The equipment selected was a series of optical sorters supplied by CP Manufacturing and MSS. Optical sortation uses infrared light to identify specific recyclables. Once identified the machine ejects air and sends the targeted item to the designated location for accumulating and baling. Optical sorters are able to capture over 1000 items/minute in many circumstances where a human sorter can capture 35-45 items/minute. The total project cost exceeded $5 million with an estimated payback of 3-4 years. The project was funded through a 0% interest loan through Closed Loop Partners and awarded grants through the Iowa DNR and The Recycling Partnership.

One barrier to the implementation of this project was installation while continuing to process recyclables. This enabled us to provide streamlined service to our customer base. Installation occurred during our processing hours and our off hours. To ensure safety and production, a focused plan with continual communication was imperative. Another barrier to achieving the full capability of the equipment was thorough testing and installation of additional components for the manufacturer to meet the required quality/recyclable capture goals. In order to meet contractual obligations, the equipment manufacturer installed two metal detectors in January 2024 which contributed to an improvement in quality and capture rates.

The 600-ton goal to increase the capture of plastics, tin, and aluminum was based on material sorts conducted prior to equipment installation. The team monitored recyclables ending up in the wrong location or missing altogether. Prior to this equipment upgrade, the system relied on mechanical sortation and large amounts of human labor. The goal of the new equipment was to decrease the reliance on human labor and move individuals to less demanding, quality control positions creating redundancy and reliability in our recycling capabilities while decreasing the overall operational cost.

Since inbound recycling tonnage changes over time, we linked the 600-ton increase goal to the inbound tonnage for the specific timeframe. In FY 23 we saw 40,531 tons of single stream and we captured 4037 tons of plastics, tin, and aluminum, which is 9.9% of the overall material received. In order to achieve our 600-ton goal we needed to capture 11.4% of the total inbound for the timeframe.

Overall Results, Milestones, Public Awareness and Conclusion

This objective was a multi-year and multimillion-dollar investment set to strengthen the Scott Area Recycling Facility for Scott County and the other 25+ counties the facility supports. The specific goals were to capture more recyclables, increase the facility capacity, decrease the reliance on human sorting, and provide a high-quality product to our end markets.

There were multiple points in time where we stepped back and evaluated the status of the project. The objective and target were measured with updated results listed and tracked in Attachment 1.

A large component of this project was increased public awareness. With grant funding we were able to invest over $75,000 in recycling education, specifically our ability to sort and capture polypropylene. This education was done through print, streaming video, billboards, buses, and social media. We held a ribbon cutting with our community and local officials celebrating the benefits of our expansion with local news entities. We were also able to create a recycling center tour video to share with our community and customers to help those who haven't traveled to a recycling facility feel like they have through a video experience.

Video link: https://youtu.be/KFOpmrRP4J0?si=iXkBgIoChmSYibax

With the installation of optical sortation, the project fell just shy of the overall goal of 600 tons of additional plastic, tin and aluminum captured, or 11.4% of the overall inbound tonnage. Since Oct 1, 2023 through September 30, 2024 we received a total of 39,350 tons of single stream and captured 4469 tons of HDPE, PET, PP, Tin, and Alum. This equates to 11.3% of the overall inbound or an additional 574 tons of recyclables captured. We missed the target narrowly but achieved 99.6% of the overall goal.

The project realized all of our goals with a few unintended improvements. We were in fact able to reduce the reliance on human sorters and move our team to more quality control, lower demanding positions, lower the facilities overhead cost, and improve staff morale. We saw immediate improvement in our quality and our buyers have been able to offer additional revenue because of that quality. We have increased the facility's overall capacity from 39,000 tons annually to over 42,000 tons by increasing the hourly throughput from 10 tons/hour to nearly 12 tons/hour, and given our team more time to maintain the equipment throughout the week.

One unintended improvement was in the amount of waste we take to the landfill after the recycling process. After the equipment upgrade, we went from three compactor loads of garbage to the landfill daily to only two loads of garbage to the landfill daily. That is over 208 saved trips from the recycling facility to the Scott Area Landfill every year. This is a savings of 6,656 driving miles and over 1500 gallons of fuel, reducing our greenhouse gas footprint and overall cost. Our improvements are also keeping hundreds of additional tons out of the landfill annually.

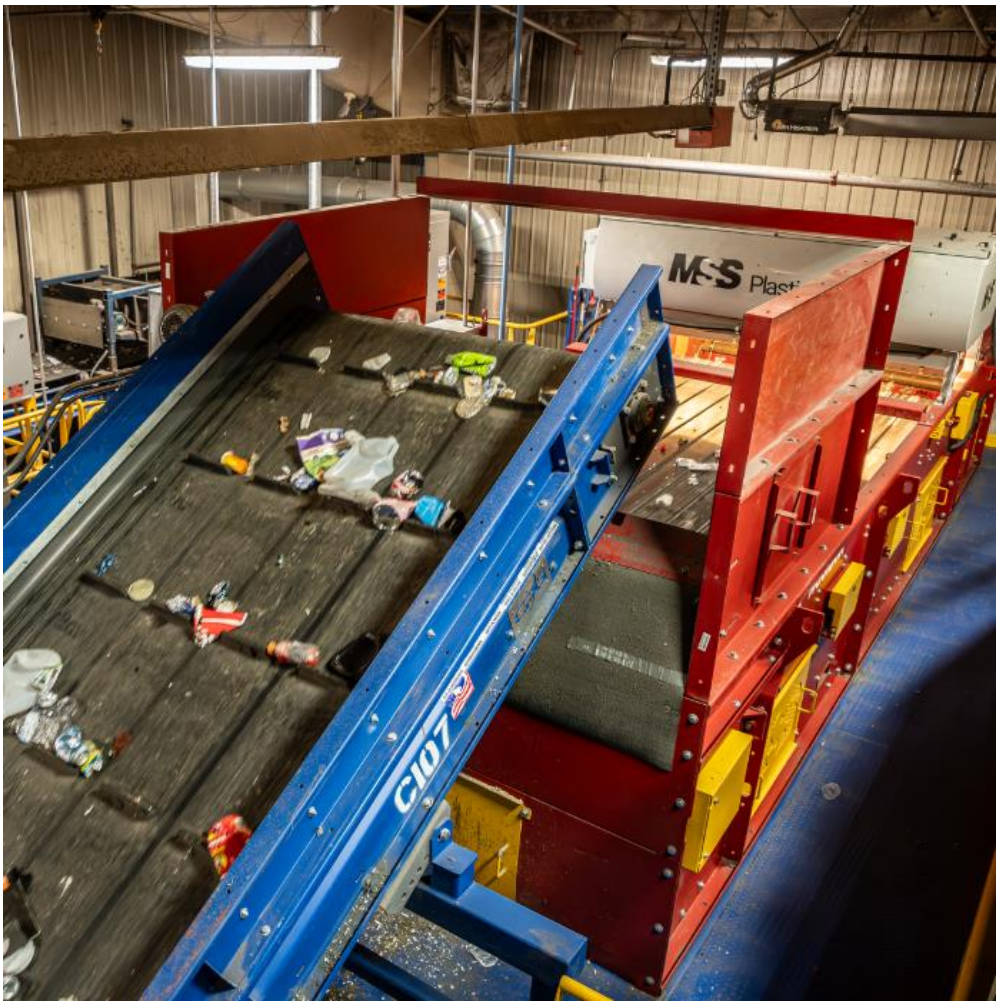
The direct economic benefits of this project are increased value of recyclables, increased tonnage of recyclables to market, decreased cost of transportation, and decreased cost of operational expense. The estimated payback of the $5 million-dollar project is still estimated to be between 3-4 years providing the Scott Area Recycling facility and over 25+ counties recycling processing stability for years to come.

Attachment 1

Results/Baseline (Update periodically, including each fiscal year by June 30th. Add rows for additional results as needed.)							
Criteria		**Applicable Time Period**	**Qty for Period**	**Qty for Target To Date**	**% from Baseline** (Calculated)	**Narrative Description**	**Date of Update**
	Baseline	FY22	3757 tons			FY22 Received a total of 38,161 tons of single stream and captured 3757 tons of HDPE, PET, PP, Tin, and Alum: 9.8% of overall	8/1/2022
	Baseline *UPDATE*	FY23	4037 tons			Following FY23 evaluation updated baseline to FY23 numbers due to increase in overall tonnage. Equipment installation/Testing July 2023 - September 2023	8/1/2023
1	**Results Update**	7/1/2022 - 6/30/2023 (FY23)	4037 tons	4037		**Re-evaluated in FY23 following an increase in overall tonnage from FY22.** Received a total of 40,531 tons of single stream and captured 4037 tons of HDPE, PET, PP, Tin, and Alum: 9.9% of overall	7/1/2023
2	**Results Update**	3/31/2024	3299.00	3442	95.8%	Since July 1, 2023, we received a total of 30,195 tons of single stream & captured 3299 tons of HDPE, PET, PP, Tin & Alum: 10.9% of overall - Note: Full capture of recyclables didn't start until November 2024. A tweak in the system increased the capture of aluminum starting January 1, 2024. Comparing non-equipment time from to equipment time frame: November 2022-March 2023: took in 16901 tons of recyclables and captured 1717 tons of our target material: 10.1% capture. November 2023 to March 2024: took in 16982 tons of recyclables and captured 1912 tons of target material: 11.2% capture.	3/31/2024
3	**Results Update**	6/30/2024	4367.00	4550	96.0%	Since July 1, 2023, we received a total of 39,918 tons of single stream and captured 4367 tons of HDPE, PET, PP, Tin, and Alum: 10.9% of overall - Note: Full capture of recyclables didn't start until November 2023. A tweak in the system increased the capture of aluminum starting January 1, 2024.	6/30/2024
4	**Results Update**	9/30/2024	4469.00	4485.00	99.6%	From Oct 1, 2023, through September 30, 2024, we received a total of 39,350 tons of single stream and captured 4469 tons of HDPE, PET, PP, Tin and Alum: 11.3% of overall.	9/30/2024
	Closure/ Final	10/1/2024		4469.00	99.6%	Our goal was to capture an additional 600 tons of HDPE, PET, PP, Tin, and Alum equating to 11.4% of our total inbound for the period tested. From Oct 1, 2023, through September 30, 2024, we received a total of 39,350 tons of single stream and captured 4469 tons of HDPE, PET, PP, Tin, and Alum: 11.3% of overall or an additional 574 tons of recyclables targeted. We missed the target narrowly and achieved 99.6% of the goal. Note: Full capture of recyclables didn't start until November 2023. A tweak in the system increased the capture of aluminum starting January 1, 2024.	9/30/2024

Optical capturing an image to identify a targeted recyclable and eject with air.

Overview of the optical dedicated to HDPE and PP capture



Overall facility shot with a quality sorting optical at the top of the shot