RECYCLING AN MRF

CONVERSION TO SINGLE STREAM IS WIN-WIN

by Marc J. Rogoff and Bruce Clark, SCS Engineers; James Howes, Escambia County; and Jerry Moore, City of Pensacola

Not unlike other communities in North America, Escambia County, located along the Gulf Coast of Florida, has for years, been on the lookout for cost-effective options to extend the life of its sole landfill, while at the same time enhance the sustainability of its solid waste management program.

Currently, the County is implementing the final stages of a landfill gas-to-energy system, as well as a landfill mining project. They have also extensively promoted increased recycling through the establishment and operation of citizen drop-off centres, a yard waste mulching program and through a new curbside collection program. Most recently, the County has successfully "recycled" a recovered materials processing facility (RMPF) into a single stream material recycling facility (MRF) designed to process recyclables from residential and commercial waste generators within the County.

Establishing curbside collection

For many years, the City of Pensacola, which is the county seat of Escambia county, had explored changes in its solid waste collection operations as a means to improve recycling rates, increase overall efficiency, and reduce City and customer costs.

"From 1990 to 1996 with the 'Dirty' MRF, citizens were told to dispose of all recyclables along with their regular garbage," explains Jim Howes, Recycling Operations Manager, Escambia County. "Some of the garbage trucks were diverted from the Class 1 landfill to the Dirty MRF at the Perdido Landfill, where approximately 30 labourers picked through the garbage and reclaimed recyclables."

"In 1995, a Blue Bag Recycling six month pilot program took place. The results were poor," continues Howes. "The program was expensive, had low participation and output, and contained high levels of contamination."

In 2007, a rate and efficiency study conducted by SCS Engineers (SCS) recommended that the City consider offering its customers curbside collection of recyclables as a means to reduce the cost of twice-a-week collection. This possibility became a reality when Escambia offered use of its RMPF at a "zero tipping fee" as part of a pilot program for a small portion of Pensacola City.

With all of the major components in place, the pilot program was rolled out in July, 2008 for the East Hill neighbourhood of the City. Customers were provided with a stone-coloured, 96-gallon Toter cart, which was placed at the curb for once-a-week pickup of paper, plastic, aluminum and steel cans.

Recycling rates in the pilot neighbourhood were encouraging throughout the 12-month month trial and there were limited cross-contamination issues reported at the RMPF. With these results, the City Council voted to expand the curbside program City-wide.

Today, the program has been expanded to include all residential customers of the City. It is also considered a mandatory program because all 19,000+ residential customers received a recycling cart and were shifted to once-a-week collection for garbage and once-a-week collection for recycling.

Current statistics show that the program has become a real success story, with the City reducing its tonnage delivered to the County's Perdido Landfill by approximately 20 percent. And while the City did need to purchase new recycling containers, the overall results show that they may potentially be able to reduce monthly collection fees with the new program.

The RMPF renovation

The Escambia County RMPF was constructed in 1990 and operated as a "dirty MRF" through 1996 when it was renovated to a dual stream operation. Waste was received in a 16,000-square-foot building (tipping floor) and tipped into two piles; glass, plastic and metal containers, and fibre. Two in-floor conveyors, one for each pile, took the material and elevated it into an adjacent building where manual labour was used to remove recyclable materials. The sorting lines consisted of two 36-inch conveyors, and recyclables were dropped into chutes next to the conveyors where they fell directly into eight separate balers. Ferrous metals went to the end of the line where an overhead magnet pitched them into a ground floor roll-off. Negative sort materials were discharged directly into two ground-floor compactors.

Converting to single stream: initially, the team at Escambia County looked at a star screen to provide automated OCC separation on the front end, but the benefit/cost of the system was not favourable. Instead, the County decided to fabricate a mobile trommel, which would involve some manual labour, for removal of OCC from the waste stream.

Around the same time as the impending implementation of the City's pilot curbside collection program, SCS Engineers was engaged by Escambia County to evaluate the feasibility of converting the RMPF to a single-stream operation.

The conversion design was a highly collaborative effort since the County indicated it would potentially fabricate some of the equipment in-house to save money, and because of the challenge of working with an older, existing facility. The key initial criterion for the conversion included:

- Providing for automated front-end separation of OCC that would work with the conveyor systems on the tipping floor;
- Raising processing efficiency by reducing or eliminating eight balers;
- Providing an effective means to capture, store and process sorted materials, all while working within the space and height limitations of the sorting building ground floor, and;
- Providing total processing capacity of approximately 184 tons per day.

Initially the team looked at a star screen to provide automated OCC separation on the front end. Although an automated system was designed that could fit into the tipping building and work with the existing conveyor arrangement, the benefit/cost of the system was not favourable. Instead, the County decided to fabricate a mobile trommel, which would involve some manual labour, for removal of OCC from the waste stream.

For capturing, storing and processing the recyclables, it was determined that the existing chutes could be retained and eight storage "bunkers" constructed on the ground floor, with up to four chutes (depending on the material) feeding a bunker. Four bunkers would be on each side of a new 60-inch wide conveyor. It was also determined that a new double-ram baler could fit under the ceiling of the RMPF's second floor and was configured to have the conveyor be a straight feed into the hopper.

The bunkers consisted of a sloping floor to allow gravity feed to the new conveyor, and steel mesh side walls supported by a light, but strong, welded steel column and beam frame. The bunker decks and substructures were also fabricated from steel, and the discharge side of each bunker uses a hydraulically-operated gate to control the flow of material onto the conveyor belt.

Total cost for the renovated system including all equipment is approximately US$351,500, not including the cost of county labour (This included approximately $311,500 for the baler and conveyors, $6,000 for the OCC trommel, and $34,000 for the bunker system.).

The single stream operation at the renovated Escambia County RMPF facility has been fully operational now, since July of this year, and is taking in all of the City of Pensacola's recyclables.

"Both the City of Pensacola and Escambia County are extremely pleased with the results," says Marc Rogoff, SCS Engineers. "The City was able to convert immediately to curbside collection, and the County has been able to reutilize their facility, and convert to single stream operation. It really has been a win-win for everyone involved."

SCS Engineers
Reader Reply Card: 1387
Web link: baumpub.com/RPN1387