SWANA RECYCLING
TECHNICAL ASSISTANCE STUDY
FINAL REPORT
PRELIMINARY FEASIBLILTY STUDY
RECOVERING CARDBOARD AT THE
YORK COUNTY RESOURCE RECOVERY CENTER

Prepared for:

YORK COUNTY
SOLID WASTE AUTHORITY,
YORK COUNTY, PENNSYLVANIA

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SWANA RECYCLING TECHNICAL ASSISTANCE STUDY
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SWANA TECHNICAL ASSISTANCE STUDY
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1.0 INTRODUCTION

Through the partnership with the Solid Waste Authority of North America (SWANA), the Pennsylvania State Association of Township Supervisors, and the Pennsylvania Department of Environmental Protection (PADEP), the York County Solid Waste Authority (YCSWA), York County, PA was approved for a technical assistance project to be provided by Gannett Fleming, Inc. (GF).

Gannett Fleming will assist the YCSWA by completing the following tasks:

1.1 Scope of Work

Task #1 GF staff will work with the YCSWA to obtain background information related to the York County Resource Recovery Center (YCRRC), County recycling activities and facilities, and other pertinent background information to aid in completing this assignment. Task #1 will include a site visit to the YCRRC.

Task #2 Based on background information, site visit observations, testimony from recycling/ waste management professionals, and existing knowledge, GF will complete a preliminary feasibility study for the recovery of cardboard from the municipal waste stream entering the facility. Task #2 will include providing the YCSWA with a draft report and initial recommendations, which will assist the YCSWA in determining if a trial cardboard recovery effort should be conducted.

Task #3 GF will prepare and provide the YCSWA with a final summary report of findings and recommendations. This task includes a review of the report by the Pennsylvania Department of Environmental Protection (PADEP) and response to PADEP comments. Additionally, an electronic file of the final report will be submitted to PADEP along with a MS Word summary (as required) of the project conclusions and findings. An electronic and hardcopy version of the report will be provided to the YCSWA and SWANA.

2.0 BACKGROUND

The York County Resource Recovery Center (YCRRC) is a waste-to-energy facility that converts solid waste into a smaller volume of ash and produces electricity. The YCRRC is the only waste-to-energy facility in Pennsylvania to be designated as a "green power" source (i.e. uses garbage in the production of electricity in place of fossil fuel). The facility is located in Manchester Township (see **Figure 1**). All York County generated processible household waste as well as all processible commercial waste is managed at this facility. The YCRRC also processes a substantial quantity of York County commercial waste. Out-of-county waste accounts for approximately 100,000 tons per year of waste processed at the YCRRC. The facility also accepts residual waste.

The York County Solid Waste Authority (YCSWA) is interested in determining the feasibility of manually recovering cardboard from the tip floor of the YCRRC. The YCSWA estimates the YCRRC will reach its maximum facility capacity in about 6 to 7 years. By recovering and processing cardboard, the YCSWA anticipates it could increase facility capacity/ life. The YCSWA hopes to increase the available capacity of the facility and also provide a benefit through recycling cardboard that would otherwise be incinerated. If a portion of the wastestream (i.e. cardboard) can be diverted, resulting in extending capacity into future years, this would minimize (or delay) waste that will bypass the waste-to-energy facility when capacity is reached. Bypassing waste to other approved disposal facilities may create operational challenges at both the YCRRC and also at the backup disposal facility(ies) targeted to receive the bypass waste. At this time, Modern Landfill in York County is contracted to receive bypass waste from the YCRRC.

3.0 EXISTING YORK COUNTY RECYCLING PROGRAM

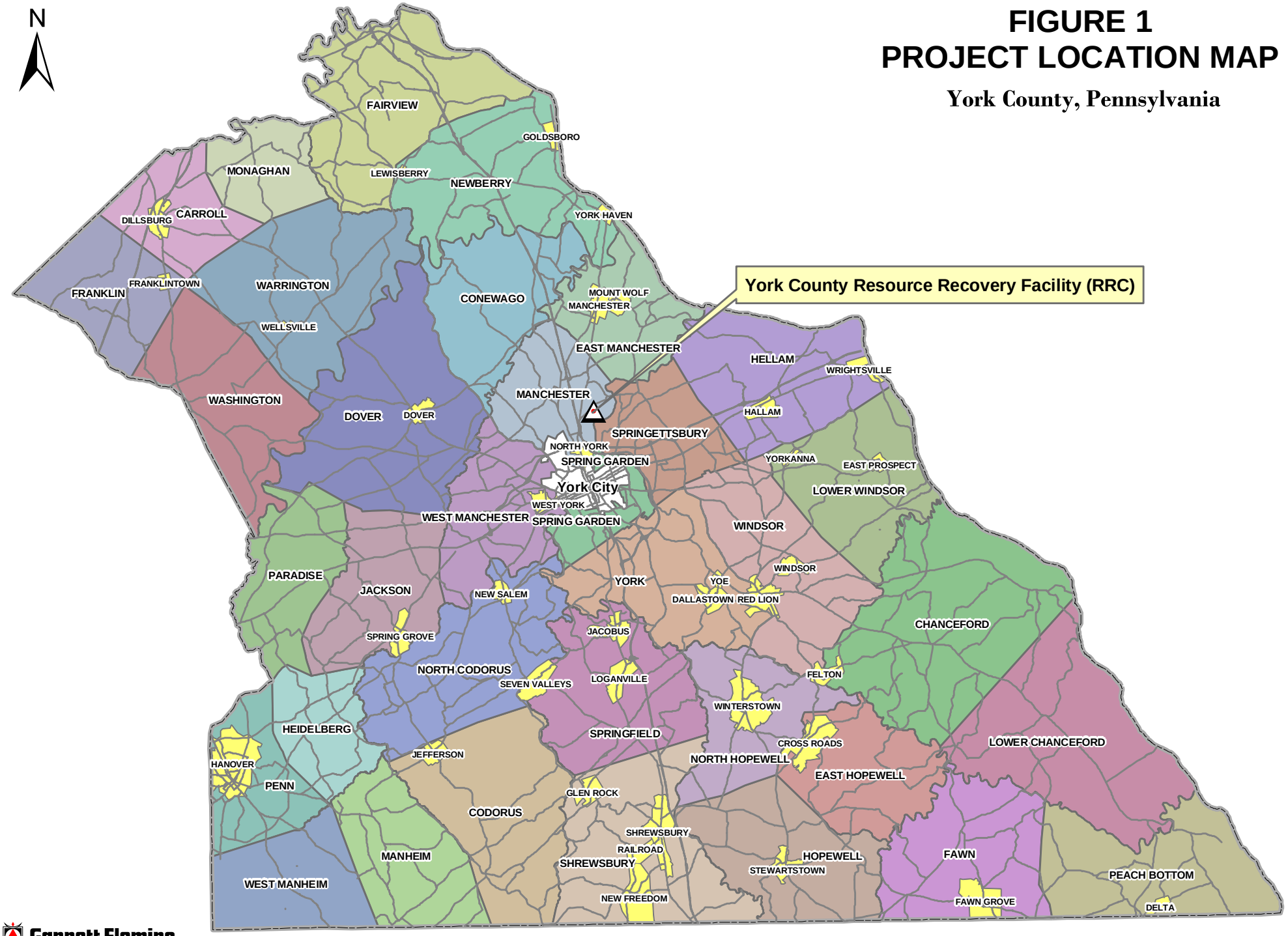
This section provides a brief overview of York County's residential recycling program. Residential recycling activities in the County have an impact on the municipal waste stream that reaches the YCRRC. York County has an extensive recycling program that consists of a variety of recycling options and systems.

York County's recycling program includes recyclables collected from the following:

- **Municipal curbside programs**
- **Municipal drop-off programs**
- **Commercial establishments**
- **Yard waste recycling efforts**
- **Ferrous/ non-ferrous metals separated at the YCRRC**
- **Authority drop-off and special recycling programs**

FIGURE 1
PROJECT LOCATION MAP

York County, Pennsylvania



Gannett Fleming

3.1 Curbside Recycling Programs

York County has 14 municipalities required to provide curbside recycling service under the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101). The Act 101 recycling mandate is based on population/density of the municipality. Currently, 54 out of 72 municipalities participate in curbside recycling. Approximately 85 percent of York County's population participates in curbside recycling. None of the cubside programs in York County collect cardboard.

3.2 Drop-off Recycling

A number of municipalities in York County operate drop-off recycling programs. The York County Materials Drop-off Facility is located across from the YCRRC (2651 Blackbridge Road) and accepts the following recyclables:

- Aluminum and Steel Cans
- Glass Containers
- Plastic bottles, containers, jugs
- Newsprint (loose)
- Cardboard (broken down)

Other County-wide drop-off programs include:

- Electronics recycling
- Household hazardous waste
- Phonebook recycling
- Battery collection

3.3 Commercial/ Institutional/ Industrial Recycling

For the most part, it is the decision of the businesses and institutions in York County to privately subscribe with a hauler to provide for recyclables collections services. Although many of the establishments are located in Act 101 mandated municipalities and are required to recycle, many commercial/ industrial/ institutional establishments slip through the cracks and default to disposal before recycling. As reported in the Pennsylvania Recycling Market Center Study – Phase I by RW Beck (February, 2003), there is indication that the collection infrastructure in place (in Pennsylvania and other parts of the Country) may be inadequate for recovering recyclable paper – particularly for OCC and office paper from smaller establishments in commercial, municipal, and institutional settings.

Several commercial recycling markets in York County that accept cardboard from residents and small businesses are First Capital Fibers, Inc. and NCB commodities, Inc and Recycle America.

4.0 YORK COUNTY RESOURCE RECOVERY CENTER

The YCRRC is owned by the YCSWA. The center operates 24-hours a day, every day of the year and is designed to process 1,344 tons of waste per day. The facility processes all of York County's processible municipal solid waste, some types of residual (manufacturing) waste, and some out-of-county wastes. The facility accepts out-of-county waste to maintain optimum

daily operations. As York County-generated waste increases, the YCSWA reduces the quantity of out-of-county waste accepted at the YCRRC. Scrap metal is recovered (and marketed) from the municipal waste to reduce maintenance/ operation hindrances that can result from processing this material. After the combustion process, ash residue from the facility is recycled into an aggregate used in construction applications. Ferrous and non-ferrous metals are also recycled from the ash. Any non-processible waste that is delivered to YCSWA for processing is forwarded to Modern Landfill located in Windsor Township.

The YCSWA has a service agreement authorizing Montenay Power Corporation to maintain and operate the YCRRC through 2015. The Authority also has a long-term contract with GPU Energy to purchase the electricity generated by the waste-to- energy technology. YCSWA waste projections estimate the YRRC facility will reach maximum total facility capacity in approximately 6 to 7 years. At that time, and maybe earlier due to fluctuations in waste volume, it may be necessary to divert a portion of the waste stream to other waste management facilities.

5.0 PRELIMINARY FEASIBLITY ANALYSIS FOR CARDBOARD RECOVERY

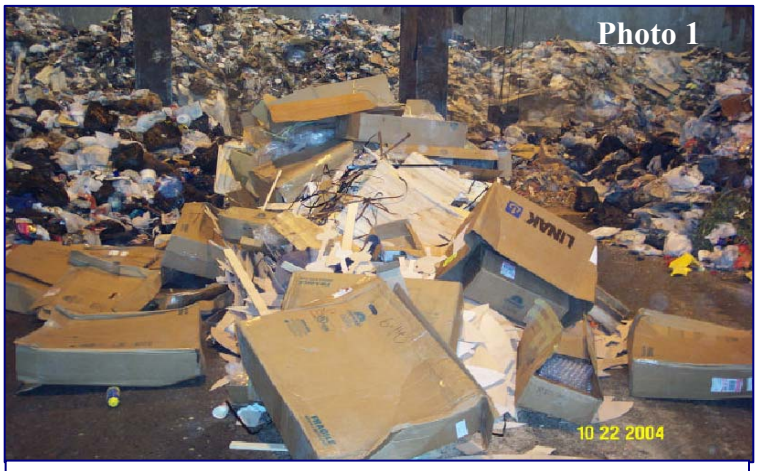
A preliminary analysis was conducted to determine the methods that could be used to recover cardboard at the YCRRC, and to determine what impact cardboard recovery may have on extending the capacity of the facility into future years. The analysis considers a low-tech (low cost) manual cardboard recovery operation at the YCRRC that would use a limited number of laborers to pick out cardboard (described in more detail in the following sections). Although it was recognized that increasing the number of laborers would increase the amount of cardboard recovered, the analysis only considers use of one to two laborers/ pickers. Using additional laborers, beyond one or two persons, for cardboard recovery (in this low-tech recovery scenario) is not feasible because of significant space limitations within the existing footprint of the building. These space restrictions could create unsafe conditions for the cardboard laborers/ pickers and other YCRRC staff, restrict the traffic flow of existing work vehicles, disrupt staff and existing operations, decrease work efficiency, and contribute to poor equipment and space utilization. Increasing the number of staff also increases staffing costs.

As discussed with the Southcentral PADEP office permitting representative (Phone: 717-705-4907), a Minor Permit Modification will be required to implement a manual cardboard recovery program at the YCRRC. The Minor Permit Modification is needed to address operational and safety procedures. The associated permit fee is $300.

5.1 "Dump and Pick"

As reviewed with the YCSWA, GF's preliminary feasibility analysis was to determine if OCC could be recovered in sufficient quantity to create capacity at the YCRRC, which would extend the facility life into future years (beyond the estimated 6-7 year facility life). This analysis is for recovery of cardboard using one full-time employee (and other existing staff as needed) to pick through commercial/industrial/institutional loads of municipal waste dumped onto the YCRRC tip floor. This method of sorting is often referred to as "dump and pick". Because it was immediately evident that engaging in a manually intensive recovery of other recyclables (e.g. office paper, mixed paper, and/or container recyclables such as cans and bottles) was not feasible, recovering these recyclables off the tip floor was not considered.

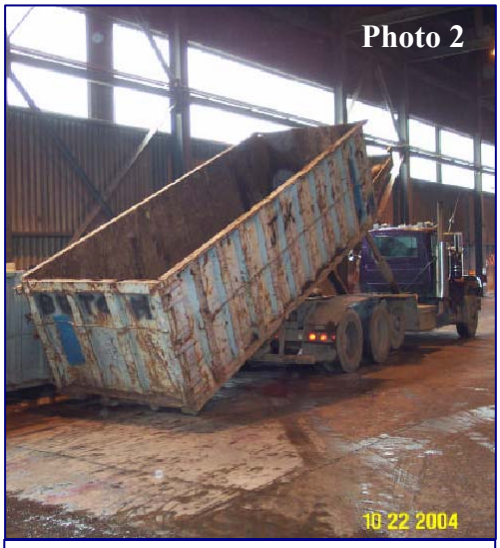
Manual removal of cardboard from mixed loads of waste is not an easy task. Although there will be a few commercial loads that enter the facility with a visibly large quantity of recoverable cardboard, this is the rare case (see **Photo 1**). Much of the cardboard will be buried in the waste rows that are typically 3' 5' deep and 5' to 8' wide.



A Non-typical Commercial Cardboard Load received at the YCRRC

to

The proposed method of cardboard recovery envisions using a forklift to place a self-tipping hopper (see **Figure 2**) beside the waste load, out of the way of tip floor truck and equipment traffic. The picker will then remove visible cardboard from the waste piles and fill the hopper. A light metal hook may be used as a tool to grab cardboard from the middle or top of the waste pile (climbing or digging through the pile should be avoided). Once filled, the self-tipping hopper can be moved by the forklift, raised, and then tipped into a roll-off container like the one shown in **Photo 2**. Assuming a picker works 8 hours a day with marginal assistance from other existing facility staff, it is roughly estimated that 1-2 tons of loose cardboard per day could be retrieved from the waste. Annual recovery (assuming 5 days a week, 260 days) is estimated at between 260 and 520 tons. After the loose cardboard is collected in the roll-off, it could be taken directly to a local cardboard recycling market. Markets are described further in Section 5.4.



YCSWA Roll-off Container

An alternative to loose delivery of cardboard is to bale the cardboard on-site. Although the preliminary cost estimate in Section 6.0 shows a small and relatively low cost vertical baler, further analysis should be completed prior to procuring any baler. Preliminary investigations reveal there is very limited space at the facility for siting a baler. Additionally, there is no loading dock and little or no storage space for bales. In preferred scenario, cardboard would be loaded directly into a baler, finished bales would be pushed/ loaded directly into a docked box trailer, the box trailer would remain docked until filled, and the completed load would be hauled to a local market.

Figure 2:
2 Cubic Yard Self -Dumping

5.2 Site Visit

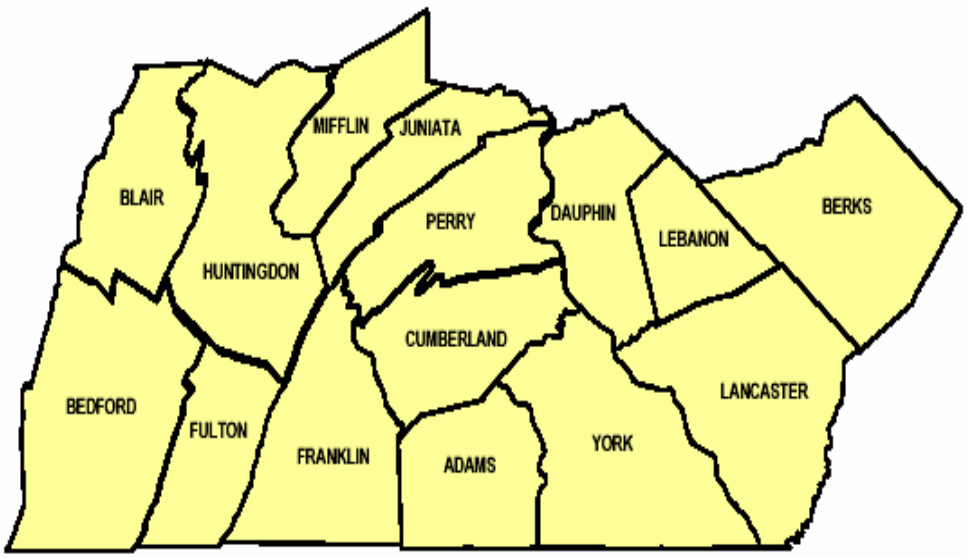
On October 22, 2004, GF met with the YCSWA to complete a site visit of the YCRRC. During the site visit, GF made general observations of the facility layout, available space for equipment, staff and equipment movement on tip floor, and quantity of cardboard available to feasibly remove from the waste loads. These observations were beneficial in determining a workable method of cardboard recovery and for selecting equipment (presented in Section 6.0).

5.3 Estimating the Available Quantity of Cardboard

It is noted that this SWANA technical assistance study and estimate focuses on cardboard generated from the commercial sector (not the residential sector). This was done because, as reported by the RW Beck Statewide Waste Characterization Study (2003) for the Southcentral Region of PA, cardboard from the commercial sector represents nearly 70 percent of all the cardboard in the municipal waste stream. Further, recovering cardboard from bags of mixed residential waste is not practical and/or cost effective (using the proposed manual method of recovery) . Residential cardboard is often contaminated (e.g. greasy, wet, covered with food other materials or chemicals), and is often in small pieces, which are difficult to retrieve and handle, and thus time consumptive to recover.

The YCRRC processes approximately 426,000 tons of waste annually. Information from the RW Beck Statewide Waste Characterization Study was used to estimate the potential quantity of cardboard available for recovery at the YCRRC. **Table 1** shows cardboard as the second largest component of the municipal waste stream (shown as a percent) for the Southcentral Region of Pennsylvania (see **Figure 3**). Only food waste exceeds cardboard in the quantity (weight) of material present in the waste stream.

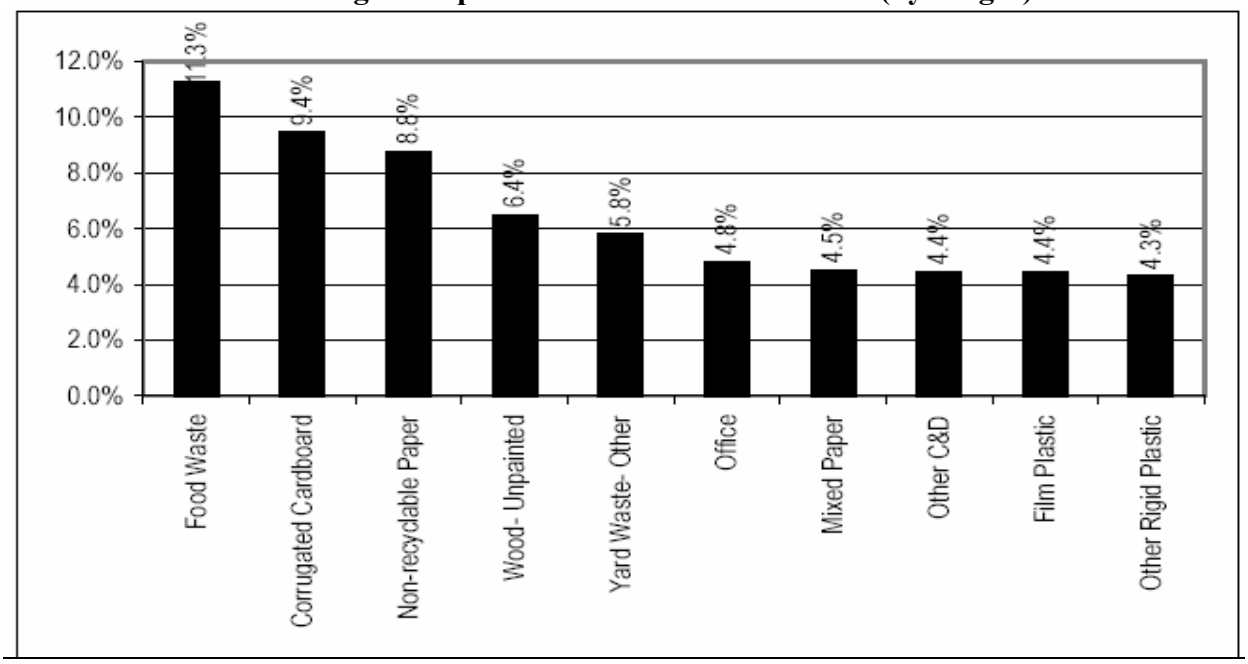
Figure 3: Southcentral Region (PA)



Source: RW Beck Statewide Composition Study

Using 426,000 tons of waste processed annually at the YCRRC, the total estimated quantity of cardboard (i.e. residential plus commercial) received annually is **40,044** tons (based on 9.4% as shown in **Table 1**).

Table 1: Southcentral Region Top 10 Most Prevalent Materials (by weight)



Source: RW Beck Statewide Waste Composition Study (2003)

Using the RW Beck Statewide Composition Study breakdown of disposed residential and commercial cardboard [residential (31%) commercial (69%)], the estimated "potential" quantity of cardboard expected from commercial/ industrial/ institutional loads is **27,630** tons. The "potential" cardboard recovery equates to approximately **six percent** of the total waste (i.e. all processible waste) taken at the facility, when compared to the 426,000 annual tons processed at the YCRRC.

The "actual" recovery of cardboard from the YCRRC tip floor using a "dump and pick" method is estimated at **260 to 520** tons using one laborer/ picker or **520 to 1,040** tons using two laborers/ pickers. This equates to a very small amount of the total cardboard processed at the facility. Even using the high end of the estimate (1,040 tons), the "actual" cardboard recovery is estimated to account for less **than one percent** of the total annual processed waste.

5.4 Cardboard Markets

When compared to many other recyclables, cardboard is a relatively stable recyclable commodity because of available markets. Of course, the market price can vary significantly based on a number of market variables. Cardboard has a number of end uses and there are available local markets for recovered cardboard (including several in the York area). Boxboard and linerboard are manufactured using cardboard or old corrugated containers (OCC) as a feedstock. Pennsylvania has a few boxboard manufacturers and also a number of mills that accept cardboard (cardboard markets also exist in nearby states).

Some of the local cardboard markets are include the following:

Spectrum Recycling, Inc.
205 Industrial Road
Highspire, PA 17034

NCB Commodities, Inc.
3340 Concord Road
P.O. Box 3338
York, PA 17402-0338

Recycle America
4555 Mt. Pisgah Road
York, PA 17402

First Capital Fibers, Inc.
256 W. King Street
York, PA 17402

NCB Commodities, Inc. and First Capital Fibers, Inc. were contacted in November, 2004. Both companies indicated they accept loose and baled cardboard. Quoted delivered prices, which may vary based on material condition, volume, market agreements, and market conditions are presented in **Table 2**.

Table 2: Local Delivered Market Prices (November 2004)

Cardboard Market	Baled Price	Loose Price
NCB Commodities, Inc.	$65/ ton	$40/ ton
First Capital Fibers, Inc.(1)	$30/ ton	$20/ ton

(1) First Capital indicated they would provide a more accurate quoted price after a visit to the YCRRC facility and viewing the product.

5.5 BTU Value

In the October 22, 2004 meeting with the YCSWA, there was some discussion related to how removing cardboard from the YCRRC would impact the BTU values of the resultant waste as fuel. As reported by the YCSWA, the mixed waste processed by the YCRRC typically ranges from 4,500 BTU/ lb. to 5,000 BTU/ lb. Cardboard typically produces 7,000 BTU/ lb. Any cardboard removed at the YCRRC would be replaced by mixed waste that produces 4,500 BTU/ lb. to 5,000 BTU/ lb. A detailed analysis of BTU's was not necessary because the study findings indicate the "actual" quantity of cardboard recovered through a "dump and pick" operation at the YCRRC amounts to a negligible portion of the total waste processed at the facility. Therefore, removal of cardboard in this manner will have virtually no impact on the BTU output of the facility. If, in the future, the YCSWA proposes a much more intensive cardboard/ recyclables recovery program at the YCRRC (e.g. dirty MRF system where conveyor fed waste is sorted to recover one or more recyclable materials), a closer review of BTU values may be necessary.

5.6 Case Studies

Manual recovery of cardboard directly off the tip floors in transfer facilities, waste-to-energy facilities, or other facilities that process mixed loads of municipal waste is not common practice. The PADEP Central Office indicated they were not aware of any facilities in Pennsylvania that had a tip-floor recovery operation for cardboard.

The collective opinion (from industry professionals interviewed in this study) concerning cardboard recovery from a tip-floor is that it is usually only feasible if the facility already has the necessary infrastructure in place. If a retrofit is required such as baler procurement and installation, construction of a storage area, moving existing equipment or structures, it is often not recommended. An additional consideration is that this material will need to be marketed. Marketing cardboard (and most recyclables) requires some effort to secure the best price for the material. Often prices fluctuate significantly, which in some cases means working with several vendors for the same material to ensure a stable outlet for the material.

6.0 PRELIMINARY COST ESTIMATE

The YCSWA requested GF to provide costs of a baler and associated equipment that may be used in a cardboard recovery operation at the YCRRC. GF contacted Innovative Design Concepts II, Inc. (a recycling equipment vendor) to gather information related to cardboard balers. Baler recommendations from the vendor considered the following:

- There is limited space available in the YCRRC. The recommended vertical baler requires a minimum operating area of 102" x 123". There needs to be 24" – 36" behind the baler (sufficient room for a person to get behind baler as needed).

- The manual recovery operation for cardboard will generate a relatively low volume of material and therefore does not appear to make the higher capital cost of a horizontal baler the best alternative.
- Vertical balers can be fed cardboard directly and do not require installing a conveyor feed system (space prohibitive).

As shown in **Table 3**, the total estimated capital cost for the equipment needed to implement a cardboard recovery program that includes a vertical baler is $**11,560**. Supporting price quote and vendor literature is provided in **Appendix A**. The capital cost estimate assumes that the YCRRC's existing Bobcat, front-end loader, and forklift will be used and will not be an additional procurement cost. The use of the Bobcat and front-end loader will be nominal, considering the load method will primarily entail manual loading of cardboard into a self-tipping hopper, which can be moved and dumped by the existing forklift. Recognizing the facility does not have infrastructure in place for baling/ storing/ shipping cardboard in the most efficient manner, it is not recommended a baler be procured without further evaluation.

The annual operating costs are estimated based on one full-time laborer. The existing Bobcat & front-end loader operators will assist as needed, and this cost will be absorbed by the YCSWA. Table 3 shows the roll-off rental cost and roll-off pull costs based on the current fees paid for these services by the YCSWA. The operating cost estimate assumes four pulls per week based on 1-2 tons of cardboard per day. The Environmental Protection Agency's (EPA) standard volume-to-weight conversion for cardboard is 50-150 pounds per cubic yard (say 100 pounds per cubic yard) using a 40-cubic yard container. The YCSWA may need to take the roll-off to market as many as four or more times per week.

Table 3: Preliminary Cost Table

Capital Costs			
Description	**Quantity**	**Unit**	**Cost**
Vertical Baler (Model 60SHD)	1	Ea	$10,300.00
Bale Wire (14' X 14 GA wire)	1	Pallet(1)	$560.00
Bobcat(2)	1	Ea	$0.00
Front-end Loader(2)	1	Ea	$0.00
Forklift(2)	1	Ea	$0.00
Self-tipping Hopper	1	Ea	$700.00
		TOTAL	**11,560.00**
Operating Costs			
Description	**Quantity**	**Unit/Desc.**	**Annual Cost**
Laborer/ Picker(3)	1 - 2	Full-time	$25,000 – 50,000
Bobcat & Front-end Operator(4)	1	As needed	$0.00
Roll-off Rental	1	Each	$720.00
Roll-off Pulls (assumes 4 pulls per week)	4	Pulls/week	$20,800
		TOTAL	**$46,520 - $71,520**

(1) Minimum order for bale wire ties is 10 bundles of 250 ties/ bundle if the quoted vendor is used.
(2) The YCSWA owns a front-end loader and Bobcat and would use the existing equipment as needed.
(3) Assumes full-time temp worker at $12 per hour x 52 weeks x 40 hours per week (est. by YCSWA)

As noted by PADEP, some vendors can supply a baler at a cost that is amortized over the life of a contract for the supply of materials to be baled.

6.1 Revenue Generation

As shown in Section 5.4, current cardboard prices at local York markets range from $20 - $40 per ton loose, and $30 - $65 per ton baled. Using the "actual" cardboard tonnage estimate of 260 to 1,040 tons per year, applied to loose cardboard market prices, the annual revenue from sale of loose cardboard ranges from **$5,200** to **$41,600**. Although the 260 – 1,040 estimated tons of recycled cardboard will have a negligible impact in extending the life of the facility, the removed tons will be replaced by out-of-county waste. The YCSWA receives $30 per ton (tip fee) for out-of-county waste. Assuming all the tons of cardboard are replaced by out-of-county waste, the YCSWA may receive an additional **$7,800 - $31,200** annually from tip fee revenue.

Combined, annual revenue from sale of recovered cardboard (loose) plus tip fee revenues from out-of-county waste may range from **$13,000 – $72,800.**

7.0 CONCLUSIONS AND RECOMMENDATIONS

The York County Resource Recovery Center (YCRRC) anticipates reaching maximum total facility capacity in as little as 6-7 years. This evaluation was conducted to determine if a manual cardboard recovery operation off the tip-floor of the YCRRC would be a feasible alternative for creating additional capacity, which would extend the life of the facility into future years. When capacity is reached, the York County Solid Waste Authority (YCSWA) will have to coordinate with other waste facilities to handle the bypass waste. Diverting waste from the YCRRC to other facilities can complicate operations for both the YCRRC and for the facility

receiving the bypass waste. Notably, bypass waste will only be problematic until an alternate solution is found. At this time, the YCSWA is in the early stages of seeking and developing a long-term solution to meet their waste disposal/ processing needs.

The YCSWA processes over 426,000 tons of waste annually. As estimated in this report, the total "potential" cardboard from the commercial sector for recovery from both York County municipal waste and out-of-county municipal waste sources is approximately **27,630 tons** annually. This equates to approximately six percent of the total waste processed each year by the YCRRC. Using one or two full-time employees, with some assistance from existing YCRRC staff, a "dump and pick" type operation may yield an "actual" cardboard recovery of one to four tons per day (i.e. 260 – 1,040 tons per year). Thus, the quantity that can be recovered (in this manual recovery scenario) is **less than one percent** (by weight) of the total processed waste at the YCRRC, and would have a negligible impact in creating additional capacity or extension of the life of the YCRRC into future years.

Although manual cardboard recovery will not extend the life of the facility, a cardboard "dump and pick" recycling program at the YCCRC could still be considered as an extension to its many other successful recycling programs. It appears that local market prices and additional tip fees may offset some of the costs for implementing a low-tech cardboard recovery program. Additionally, for every ton of cardboard diverted from processing, the YCSWA can replace the tons with out-of-county waste (generating $30 per ton). This program would not be a revenue generator and would not extend the life of the facility, but may be a beneficial recycling program if operated efficiently and if market conditions and labor costs are favorable. Unfortunately, the scale of the manual cardboard recovery option must be kept small due to safety and operational concerns that are heightened by the limited amount of available space on the tipping floor of the facility (refer to Section 5.0). As discussed with a Southcentral PADEP representative who handles resource recovery facility permitting (717-705-4907), a **Minor Permit Modification** is be required to implement a cardboard recovery program at the YCRRC. The Minor Permit Modification is needed to address operational and safety procedures and the associated permit fee is $300.

7.1 Trial Period for OCC Recovery

If the YCSWA is interested in attempting a "dump and pick" recovery operation similar to the one described in this report, it is suggested a one to three-month trial period is used to validate the program. As stated in Section 1502(c) Removal of recyclable materials: "Two years after the effective date of this act (Act 101), no person ay operate a resource recovery facility unless the operator has developed a program for the removal to the greatest extent practicable of recyclables materials, such as plastics, high grade office paper, aluminum, clear glass and newspaper from the waste to be incinerated". The three-month trial may demonstrate that the "dump and pick" process may be a practicable method to feasibly recover cardboard in a manner consistent with Act 101 expectations for resource recovery facilities. A Minor Permit Modification will not be required to be completed for the trial period. However, the YCSWA should notify the PADEP Southcentral Regional office permitting department (via letter) of the YCSWA's intentions to conduct the trial period for recovery of OCC.

There would be relatively little capital investment in equipment, and equipment may be rented for the trial period. Loose material collected in roll-off containers can be marketed

directly to local cardboard recyclers. It does not appear the facility has the existing infrastructure in place for baling/ storing/ shipping cardboard, and it is not recommended a baler be procured without further evaluation. If the YCSWA considers conducting a first-cut trial for cardboard recovery, it should use the information in this report to determine how/ if they may proceed.

If the YCSWA continues to evaluate other methods of diverting waste from the YCRRC as a means to create additional capacity, it may consider:

- **Mandated Commercial Recycling through Municipal Ordinance and Bid** – Some municipalities have been successful in bidding commercial recyclables collection services through the municipality to secure a competitive hauling cost from one (or more) haulers. This system may mandate commercial recycling through contract and/or ordinance or other legal mechanisms.

- **"Dirty MRF"** – A conveyor fed waste sorting system could be constructed at the front-end of the YCRRC to recover one or more valuable recyclable materials such as cardboard. This system may include manual and mechanical sorting and may be used to process a selected portion of the waste deliveries.

- **Educating The Commercial Sector** – Individual commercial accounts can be contacted on an ongoing basis about recycling requirements, methods and goals.

FUNDING

The YCSWA should continue to pursue state grant funding as necessary to help offset the costs of developing new recycling programs and improving the existing recycling programs. Because grant funding is not guaranteed, the YCSWA should not rely on grant funding as the support mechanism for any programs.

902 Recycling Program Grant

- As it becomes necessary, the YCSWA should apply for 902 Grant funding for up to 90 percent reimbursement for recycling equipment, containers, and educational outreach. It is emphasized that the availability of Section 902 grant funding is limited at this time. Current recycling grant applications may be submitted by June 17, 2005.

901 Planning Grant

- As the YCSWA investigates future recycling initiatives, and potentially ways to increase the capacity of the YCRRC, the YCSWA may apply (through the County) for 901 Planning Grant funding for 80 percent of approved costs for conducting related studies, surveys, investigations, and research and analysis. A much more detailed planning/ economic feasibility study would be required to identify alternative sorting methods that could recover a much larger percentage of the cardboard (or other recyclables) entering the YCRRC. An analysis of methods to increase and enforce commercial sector recycling may also be beneficial.

APPENDIX A

Recycling equipment quote and vendor literature (not in on-line report)