

**SWANA RECYCLING  
TECHNICAL ASSISTANCE STUDY**

**FINAL REPORT**

**DAUPHIN COUNTY RECYCLING CENTER  
PROPOSED DROP-OFF RECYCLING PROGRAM  
ASSETS AND UTILIZATION ANALYSIS**



**GANNETT FLEMING, INC.**



**HARRISBURG, PENNSYLVANIA**

**DECEMBER 2008**

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Navarro & Wright Preliminary/Final Design Drawing with Revisions by GF Showing Existing and Proposed Features

**SWANA RECYCLING TECHNICAL ASSISTANCE STUDY**  
**EXECUTIVE SUMMARY**  
**DAUPHIN COUNTY RECYCLING CENTER**  
**PROPOSED DROP-OFF RECYCLING PROGRAM ASSETS**  
**AND UTILIZATION ANALYSIS**

This study was conducted for Dauphin County, Pennsylvania under the Solid Waste Association of North America (SWANA) Recycling Technical Assistance program. Gannett Fleming, Inc. (GF) provided technical guidance and developed this project report pertaining to utilization of Dauphin County recycling program assets/equipment. A primary purpose of this evaluation was to conduct a site visit and background investigations of the County Recycling Center building and identify ways the County could begin to “ramp up” activities at the Recycling Center to enhance the County’s recycling efforts. This study was guided by assumptions and considerations that are described in Section 2.1. Notably, the market value for recyclable commodities fell dramatically during the course of this evaluation and influenced project findings and will continue to negatively impact County recycling program economics. Refer to Section 9.0 for detailed Conclusions and Recommendations which are summarized below.

The County Recycling Center was constructed in 2005 and is designed to process 50 tons of recyclables per day. There is nowhere near 50 tons per day of recyclables available from local generation to justify economic operation of the facility as per its design. The majority of the Recycling Center cost was paid for by Act 101, Section 902 Grant Funding through PADEP. If the Recycling Center is not used to process recyclables in a manner acceptable to PADEP, the County is at risk to pay back all, or a portion of, the Recycling Center grant.

Although the Recycling Center will not be utilized as designed in the foreseeable near future, it will be important for the County to begin a number of proposed recycling activities at the Recycling Center early in 2009. Generally, activities should include consolidation and collection of recyclables inside the Recycling Center building and use of the paved area surrounding the Recycling Center as a drop-off recycling site using the blue bins and V-Quip trucks.

As summarized, GF recommends the following from our review of existing assets and program evaluation:

**General Recommendations**

**Phased Approach:** The County should develop a concise three-year, phased approach for implementing the enhanced County Recycling program that integrates the expanded Recycling Center program initiatives.

**Profit and Loss (P&L) analysis:** To improve the County’s recycling market selection process, it is recommended the County calculate all hauling, labor, benefits and other costs (e.g. annual maintenance costs) associated with the V-Quip collection vehicles and determine the “cost per mile” for hauling recyclables.

**Commercial Recycling of Cardboard and Office Paper:** In addition, GF recommends the Recycling Center program be utilized as a recycling outlet for the commercial sector because office paper and cardboard are the “low hanging fruit”.

**Commingling/Mixing Commodities:** GF recommends the County evaluate the economic feasibility of commingling some recyclable materials to reduce transportation or other operational costs.

**Shared Recycling Arrangements with the City of Harrisburg:** The County should work with the City of Harrisburg Public Works Department to evaluate and consider recyclables consolidation arrangements that could improve recycling program economics and program performance.

**County Staff Allocation:** Due to the limited availability of County Staff and the need to use some County Staff at the Recycling Center as this program evolves, adjustments should be made to County drop-off collection routes (and market utilization) that will enable one or more drivers to assist with Recycling Center activities as needed.

**Recyclables Transfer Station Retrofit:** Based on our site visit observations, it appears that it is feasible to retrofit the City recyclables transfer facility so that a second transfer trailer could be loaded (refer to attached Figure).

**Dauphin County Municipal Waste Management Plan (Plan):** As the County further defines and implements an enhanced program utilizing the County Recycling Center, the County should reflect these programs in the County’s Plan, which calls for development of recycling goals and strategies to meet 35 percent recyclable diversion rates and Act 101 requirements.

## **County Recycling Center and Drop-off Recycling Area Recommendations**

### **Blue Bin Drop-off Recycling Area**

- **Collect the following materials as proposed by the County:**
  - Cardboard
  - Newspaper
  - Plastics (#1 and #2)
  - Aluminum and bi-metallic cans (mixed)
- **Limit Hours and days open to the public:** To “ramp up” the program, the County should limit the number of days the Recycling Center and drop-off area are open to one to three days per week.
- **Use signage** at the entrance of the facility (and other locations where public instruction will facilitate correct procedures) describing program requirements and operating hours.
- **Reposition the blue bins** from the current location near the center of the paved area to along the fence to the south.

## **Recycling Center Building**

- **Electronics Recycling:** Implement an electronics recycling program allowing residents to drop-off electronics at the Recycling Center on specified days and times.
- **Commercial Office Paper:** GF recommends the Recycling Center building be used to collect office paper from businesses. Office paper could be consolidated into gaylord boxes on skids and loaded onto a delivery truck or trailer for delivery to local market.
- **Commercial Cardboard:** GF recommends the Recycling Center building accept cardboard from County businesses.
- **Re-use:** In addition to “recycling” GF recommends the County evaluate use of the Recycling Center for “re-use” of certain items (e.g. books, certain electronics, textiles, etc.) on specified days.
- **Paving Repair:** Prior to using the loading docks, the County should repair the hole beneath the loading zone/concrete slab where the asphalt has caved.
- **Pit Covering:** There are several pits in the Recycling Center that were part of the original Recycling Center design, either for in-floor equipment or other purposes. It is recommended these holes be covered to protect both worker safety and the safety of the general public.

## **Equipment Asset Utilization**

**Vertical Downstroke Baler:** GF recommends the County move the vertical downstroke baler located at the County warehouse to the Recycling Center. The baler should be used as needed to compact overflow cardboard that exceeds the capacity of the blue bins in the Recycling Center drop-off area (and possibly to manage some cardboard accepted from businesses). Cardboard generated by the Recycling Center or other County operations could also be baled.

**GF recommends the County sell the unused Podeva glass/can crusher** to another municipality or authority so the crusher can be used in support of a sustainable public recycling program as originally intended by PADEP.

**GF recommends the County improve the utilization of V-Quip collection vehicles** (and County staff) through careful analysis of profit and loss associated with hauling routes and markets. Based on these periodic analyses, the County should adjust collection routes, generally reducing hauling distances as feasible.

## **Books and Styrofoam**

**GF does not recommend recycling styrofoam at this time:** Compared to managing other recyclable commodities, recycling styrofoam is operationally and economically not practical.

**GF does not recommend recycling hard or soft cover books at this time:** The nearest market accepting books regularly (because they have a binding cutting machine) is Cougles in Hamburg, Pennsylvania about 50 miles away. As a general rule, GF recommends books are separated into soft and hard cover book categories to provide recycling and/or re-use program flexibility.

### **Education**

**Education Campaign:** GF recommends the County conduct a comprehensive publicity/education program, placing emphasis on the new recycling opportunities offered at the Recycling Center for residential and commercial establishments

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## 1.0 INTRODUCTION

Dauphin County currently collects recyclable materials from nine public drop-off locations, County-owned buildings, special events and other venues in the County. The County is in the process of implementing a new recycling drop-off site at the County Recycling Center located just off Cameron Street in Harrisburg. The County wishes to use the Recycling Center lot to host a blue-bin Haul-All drop-off area to collect the same materials as the other nine drop-off sites. The site will also utilize the existing Recycling Center building to expand upon the current materials collected by the County's recycling program. The County has requested this evaluation of the existing Recycling Center and County recycling program assets to determine if and how these assets can be optimized to improve overall recycling program performance.

GF worked with the County to develop the following three tasks for this recycling study.

### 1.1 Scope of Work

- Task #1** Gather and review background information provided by the County including the existing recyclables program information and other information pertaining to the Recycling Center and drop-off program, assets and operations.
- Task #2** GF will conduct a site visit at the County Recycling Center to evaluate the proposed drop-off program and assets. GF will develop recommendations targeting improved overall operation performance and proper utilization of assets/equipment.
- Task #3** GF will prepare and provide the County with a summary Report of findings and recommendations. This task includes a review of the Report by PADEP and response to PADEP comments. An electronic file of the final report will be submitted to PADEP. Both an electronic and hardcopy version of the final report will be provided to the County.

## 2.0 BACKGROUND

Dauphin County is situated in the south central region of Pennsylvania and is one of the four counties comprising the greater Harrisburg area. In 2004, the County population was estimated at **253,282**. According to the U.S. Census Bureau, the county has a total area of 558 square miles bounded on the western border by the Susquehanna River. The population density is

estimated at 479 people per square mile. In 2000, there were 102,670 households with an average household size of 2.39 people.

In 2005, the County, with financial assistance from the Act 101, Section 902 Grant Program, constructed the Recycling Center adjacent to the Harrisburg Incinerator. The Recycling Center was designed to process 50 tons of recyclables per day. The City of Harrisburg collects approximately 30 tons of recyclables per week, or about 5-6 tons of recyclables per day. It has been determined by the County and several recyclables processors that there are not enough recyclable materials (and revenue potential) available in the local region to justify the high capital and operational cost to operate this facility as a sustainable recyclables processor.

## 2.1 Project Assumptions and Considerations

As a baseline condition, the Recycling Center will not operate as a recyclables processor for all recyclables collected through the County recycling program. For GF to conduct an analysis and make recommendations on what recyclables could be managed at the Recycling Center, and how the facility could be used to consolidate/process these materials, we first clarified our project assumption and considerations. Through the review of this project, GF has identified the following assumptions and considerations that influence our project approach and recommendations:

- Recyclables processing equipment including new balers, conveyors, etc. will not be added to this facility in the near future, and recyclables processing (e.g. sorting/baling/crushing) will not be a primary function or near-term goal for this facility.
- County recycling program financial resources are limited, and the County does not intend to invest in infrastructure changes to the Recycling Center in the near future. Some funds could be allocated to address minor modifications (e.g. safety) as justified. No major facility retrofits are anticipated or will be considered in this analysis.
- County recycling program staffing is limited and no new staff will be hired to assist with the MRF and proposed drop-off center. County staff includes:
  - 2 drivers (drop-off) – 40 hours per week (each).
  - 1 driver (drop-off) – 8 hours per week.
  - Same driver (in-house) – 32 hours per week.
  - 1 maintenance (drop-off and recycling center) – 40 hours per week.
  - 1 part-time weekend maintenance (drop-off and recycling center) – 10 hours per week.
  - Assistant Recycling Coordinator – At the facility 8 hours per day, 5 days per week. Tasks will include overseeing the Recycling Center operation and assisting with the County recycling program and greeting customers, but will not typically be a laborer on the Recycling Center floor, managing and processing materials.
- The Recycling Center drop-off area will accept the same materials as the other County drop-off sites.

- Electronics and books are proposed by the County to be accepted at the Recycling Center.
- Collection of Styrofoam is being considered.
- A recycling market decline/crisis began in late September 2008, changing the feasibility of certain market arrangements and scenarios.

### **3.0 EXISTING COUNTY DROP-OFF RECYCLING PROGRAM**

Recyclable materials are collected from drop-off locations by County staff using County-owned vehicles and drop-off containers. Currently, the County sponsors the following nine locations open to the public for dropping off recyclables free of charge.

- Conewago Township Municipal Building
- Gratz Borough Community Center
- Halifax Borough (by Deppen Park)
- Harrisburg City (Uptown Shopping Plaza)
- Highspire Borough
- Lykens Borough
- Millersburg Borough
- Washington Township/Elizabeth Borough
- Williamstown Borough/Williams Township

The County Recycling Center Drop-off will become the 10th County drop-off location. This new location will accept materials and, where feasible, will be used to consolidate materials like electronics, books and cardboard. The County plans to begin using the Recycling Center as a recycling drop-off center by the summer of 2009.

Current County Drop-off Materials:

- Newspapers and inserts
- Magazines and catalogs
- Telephone books
- Cardboard
- Plastics #1 & #2 (empty food, beverage and household containers)
- Aluminum and bi-metal cans
- Mixed glass: clear, green and brown (food and beverage bottles and jars).

County Drop-off materials are collected according to the following schedule.

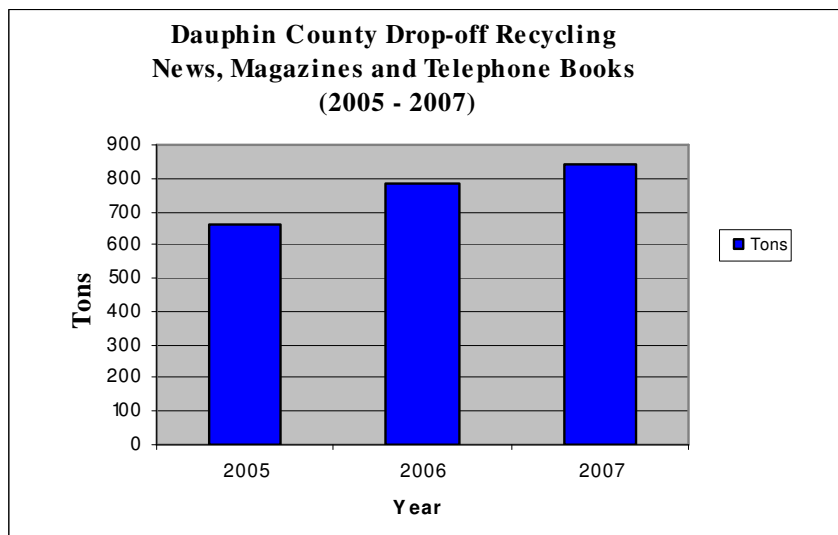
- Monday: OCC and newspaper
- Tuesday: newspaper and plastics
- Wednesday: aluminum (and bi-metal cans) and OCC
- Thursday: plastics or OCC and aluminum or newspaper
- Friday: glass, plastic/OCC, and newspaper

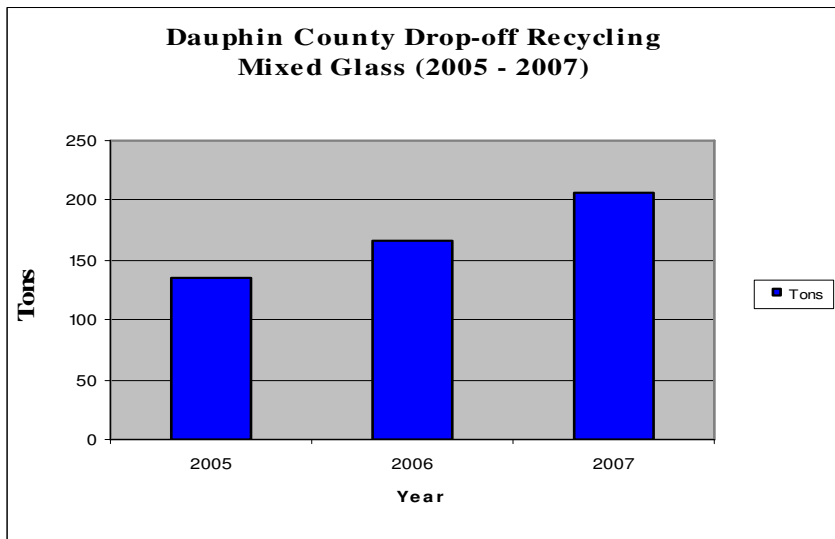
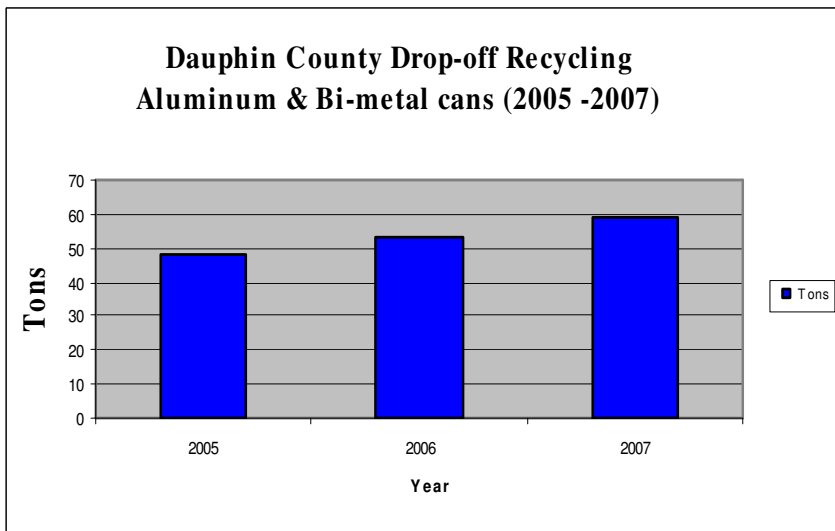
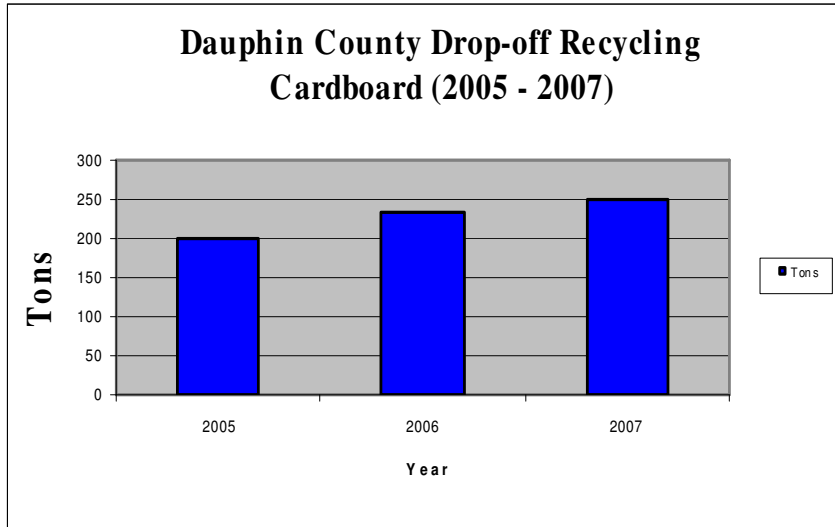
### 3.1 County-Collected Commercial Establishments

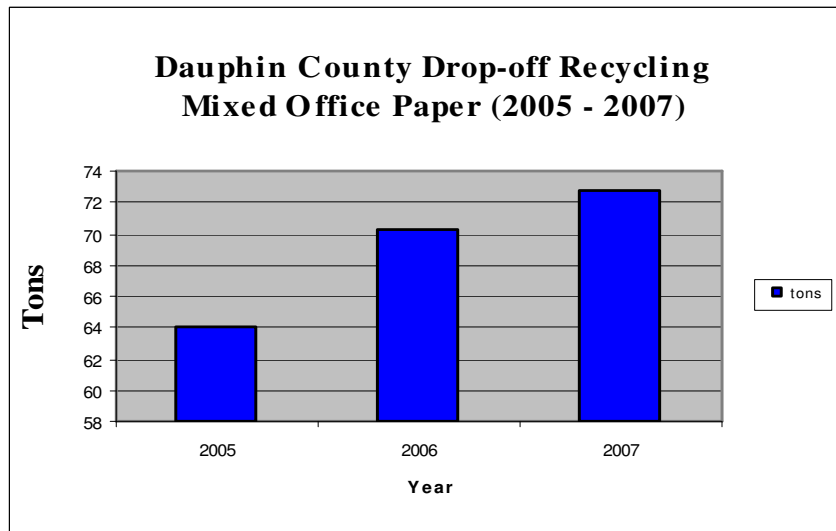
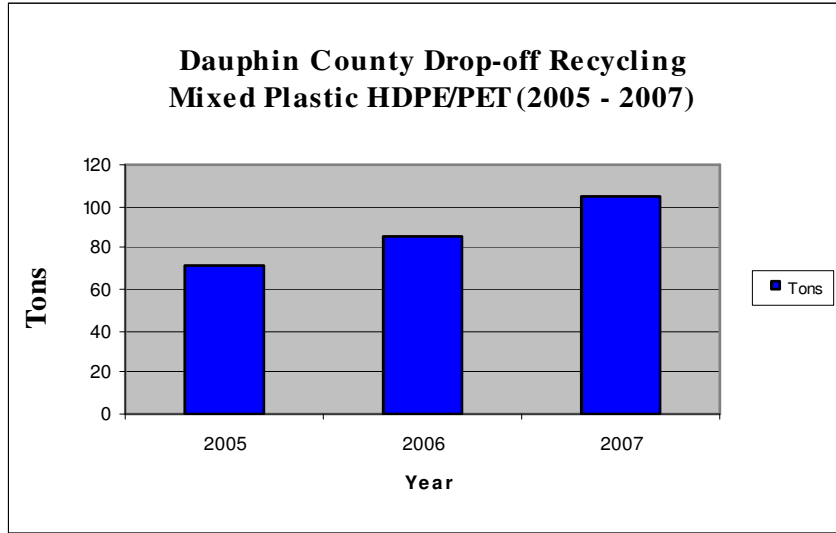
One full-time County staff member is responsible for collecting recyclable materials from all County-owned buildings including administration buildings, the Courthouse, district justice offices and parks. The County also collects recyclables from the Farm Show Complex, Harrisburg International Airport and Harrisburg Area Community College.

### 3.2 Recyclables Quantities and Data

Because most County recyclable materials are collected separately, and delivered to, and reported by several different processors, the County recycling data is broken into individual commodities as shown in the charts below. The charts show 2005 through 2007 data for recyclables collected through the County drop-off program. It is clear the program is growing with increased tonnages recovered each year during the 3-year period. The 2008 recyclable quantities (not shown) also demonstrate the continued growth in the County recycling program.







#### 4.0 COUNTY RECYCLING CENTER AND DROP-OFF PROGRAM ASSETS

Based on information provided by the County, and based on GF’s site visits, GF evaluated County Recycling program assets to determine how these assets may be used efficiently within the existing County recycling program and Recycling Center. The assets are documented along with GF notes in the Asset Table provided in the **Appendices**, and primarily include equipment and vehicles associated with the blue bin drop-off program and the Recycling Center building. Recommendations pertaining to asset utilization are provided in the Conclusions and Recommendations in Section 9.0.

#### 4.1 PADEP-Funded Equipment

One of the equipment assets housed in the Recycling Center is a Prodeva glass/can crusher. The crusher was bought by the now defunct Dauphin County Solid Waste Authority using Act 101, Section 902 Recycling Grant funds. Since this equipment is not currently being used, and no

near-term use of this equipment is planned, GF contacted PADEP concerning the County's options and steps that can be taken regarding Act 101-funded equipment not currently in use:

- Begin using the equipment for recycling;
- Sell it to another municipal/authority recycling program at a price no greater than the grant match amount, or;
- Sell it at auction and repay PADEP 90 percent of the sale proceeds (if it was funded at the full 90 percent eligible grant portion).

Since the County has no intention of operating the Recycling Center as a processor for glass/aluminum, GF recommends the County sell the crusher to another municipality, county, or authority so the equipment can be used in support of a sustainable public recycling program as originally intended by PADEP.

## 5.0 RECYCLING MARKETS

GF reviewed the current recycling markets used by the County and completed a preliminary market and transportation analysis (or profit and loss analysis) as part of our evaluation. Recyclables revenue and operational costs are critical to the successful operation of recycling programs. During the course of this study, recycling markets plummeted, drastically affecting the economics of the County recycling program and this analysis.

GF contacted Penn Waste, Inc. and Greenstar concerning the decline in recyclable commodity value beginning late September, early October 2008. Nearly all Pennsylvania markets have had to lower the price paid for recyclable commodities, and for some commodities like fiber, a processing charge as high as \$25 per ton is being assessed. Customers with market agreements have some price protection (e.g. an established floor price) and could be financially ahead of customers without agreements, unless contracts are broken.

With the current unstable and declining market conditions, now is a good time for the County to re-evaluate current operations in order to identify ways to minimize routing/operational costs. Consolidation and possibly commingling materials in conjunction with short-term/flexible market arrangements should be considered.

It is anticipated that the market downturn will last approximately 6 months and be impacted by foreign (e.g. India and China) market participation, which has dramatically decreased. The phased approach chosen by Dauphin County should take into consideration this market downturn. Contracting for longer-term marketing of materials is typically desirable, however, not in these market conditions. Contract arrangements are often based on an established, widely recognized consumer market index. For example, the Yellow Sheet, published monthly is an indicator of the market price for paper commodities as paid by mills for baled materials. Typically, there is a floor price that would guarantee the least amount paid for materials. In this market downturn, brokers may not offer a floor price due to economic risk.

## 5.1 Primary Recycling Markets Used By the County

County Recyclables are marketed by the County Recycling Coordinator to a variety of markets. The County does not typically execute fixed pricing contracts and prefers to have the flexibility to select markets and negotiate pricing. Declining market prices and market instability impact our findings and recommendations. For a time, the County received approximately \$10,000 per month from the sale of recyclables. After the market downturn, the County has lost this monthly revenue, and during December, paid a \$20 processing fee for newspaper and \$15 processing fee for cardboard. In October 2008, the County directed plastics and glass from Penn Waste's facility in York to Greenstar in Highspire due to the fall in commodity prices and to reduce transportation costs.

The primary recycling markets utilized by the County for processing recyclables from the County drop off and the commodities that are typically sent to each recycling facility are listed below. The entire list of commodities accepted by the processors is not shown.

### **Greenstar**

799 Smith Lane, Northampton, PA 18067  
(610) 262-6988

*Market for the following County commodities:*

*Newspaper #8 / #6*

*Cardboard*

*Plastics*

*Mixed glass*

### **Harrisburg Waste Paper Co.**

4200 Industrial Road, Harrisburg, PA 17108  
717-236-7971

*Market for the following County commodities:*

*Office Paper (collected in-house at County offices)*

### **Consolidated Scrap Resources Inc.**

Richard Abrams  
1616 North Cameron Street, Harrisburg, PA 17103  
717-233-7927

*Market for the following County commodities:*

*Aluminum*

*Bi-metals*

*Scrap metal*

### **Penn Waste Inc. (not used currently)**

Scott Wagner, Owner  
P.O. Box 3066, York, PA 17402  
717- 767-4456

*Market for the following County commodities:*

*Plastics (HDPE / PET)*

*Mixed glass*

### 5.2 Preliminary Market and Transportation Analysis

As GF researched the County Recycling Program, we became concerned the County was not fully accounting for, and calculating the cost of labor and transportation when determining which recyclable markets were economically feasible. The economic feasibility for each recycling market is different, affected significantly by the distance to the facility (i.e. fuel and labor time) and the price paid (or tip/processing fee) for commodities.

In this preliminary analysis (table below), GF used September fuel and commodity prices and did not factor in all costs associated with transportation and equipment (e.g. wear and tear/maintenance, etc.). We used reported County recyclables tonnage from loads of glass and plastics taken in September 2008 to Penn Waste in York, Pennsylvania and calculated an average tonnage per load and an average total rebate amount per load that is shown at the bottom left of the table. The revenue per load was calculated based on the \$25 per ton revenue paid by Penn Waste to the County at the time for plastics and mixed glass. Note: prices and marketing arrangements have changed. The **(\$33.44)** denotes a cost for trips to the York Facility.

Dauphin County -			York	Highspire
Recyclables	Rebate/ton (\$)	Cost Per Trip	Facility	Facility
Sept. (tons/trip)	\$25	Miles (two-way)	66	18
1.46	\$36.50	Truck MPG	5	5
1.59	\$39.75	Gallons Used	13.2	3.6
1.57	\$39.25	Price per Gallon (diesel)*	<u>\$4.02</u>	<u>\$4.02</u>
5.42	\$135.50	Fuel Cost per Trip	\$53.06	\$14.47
1.66	\$41.50	Driver Rate (plus 25%)	\$16	\$16
1.73	\$43.25	Driver Time (hrs)	2	1
1.75	\$43.75	Driver Cost per Trip	\$32	\$16
<u>1.34</u>	<u>\$33.50</u>	<b>Estimated Total Cost per Trip</b>	<b>\$85.06</b>	<b>\$30.47</b>
<b>2.065</b>			<b>Est. Cost or Revenue Per Load</b>	
	<b>\$51.63</b>	w Rebate	<b>(\$33.44)</b>	<b>\$21.15</b>

Assumptions: Used \$25 per ton revenue as the baseline (which was the rebate paid by Penn Waste in York for plastics/glass in September 2008). 25% added to Driver Rate for fringe benefits.

2.065 tons used as average tons per load.

\$51.63 used as average revenue per load.

\* DOE Petroleum Statistics ([http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html))

After establishing that the County was paid, on average, \$51.63 for recyclables loads at \$25 per ton, GF used County labor rates and fuel pricing and compared hauling to Penn Waste in York, Pennsylvania versus hauling to Greenstar in Highspire, Pennsylvania. The analysis demonstrates it costs over \$50 more in labor and fuel per load to delivery to York than to Highspire. As shown, for loads that weigh 2 tons or less, the result is a financial loss per load for trips to the York facility. For dense and heavier commodities, the economics change. Approximately 9 tons of newspaper can fit in a V-Quip truckload. For newspaper, Penn Waste (or another vendor) would need to pay at least \$6 more per ton than Greenstar to make the economic feasibility of the two markets about break even. The County began directing loads of glass and plastics from York to Highspire in December.

It is important for the County to conduct a similar profit and loss analysis for each commodity and market scenario. Reducing trip distance and time and minimizing dead-head hauling will save money and create opportunities to allocate staff to assist with additional work tasks associated with the proposed Recycling Center recycling activities, or for other activities as needed.

### 5.3 Corrugated Cardboard Market Analysis

For a period of about four years prior to the recent recycling commodity downturn, cardboard was a high-value commodity that peaked at \$80 to over \$100 per ton for bales. Because of the potential for high volumes of cardboard from businesses and residents, and because the Recycling Center has infrastructure that could support consolidation of cardboard, GF reviewed several options for managing cardboard at the Recycling Center.

With increased participation in the County drop-off program, GF anticipates that handling corrugated cardboard using the existing V-Quip drop-off collection system may be inefficient at the Recycling Center and some County drop-off sites. Cardboard takes up space, easily overfilling the small capacity of the blue bins. Cardboard is collected from the drop off facilities and routed directly to the processor unbaled. Overflowing bins can lead to material being left on the ground, increasing site maintenance the frequency of pickups required to service containers. To supplement the cardboard program, the County may need to investigate and implement alternatives:

- **Roll-off containers for loose cardboard:** Supplement the Recycling Center drop-off area (and possibly one or more other County recyclables drop-off sites) with larger capacity roll-offs (e.g. 30 - 40 cubic yard) containers. The containers could be serviced by the vendor on a per-pull basis and the costs should be compared carefully against staff and labor required to service cardboard in the blue bins. Chambersburg Waste Paper offers this service for \$140 per pull, plus a rental fee if you don't own the container. It is estimated that each container would hold approximately one ton. If a roll-off container is used at one or more locations, this can free up one or more blue bins for use in another location.
- **Cardboard Compactor at the Recycling Center:** Dauphin County can secure a vendor (e.g. Chambersburg Wastepaper) to supply a compactor box for cardboard. Residents and/or businesses could drop-off loose cardboard and County staff could load and operate the compactor. 2.5 to 4 tons of compacted cardboard can be loaded in a 40-cubic yard compactor. The compactor could be serviced by Chambersburg Waste Paper for \$140 per pull, plus a rental fee of \$125 per month if not owned by the County. This option would require some oversight by County staff and additional safety requirements would need to be implemented. This system requires 3-phase electrical service to the container, which is available at the Recycling Center. When prices for cardboard are high, this option can be economically feasible compared with other options. In the current market, with cardboard revenue at zero per ton or processed for a charge, a compactor is not cost effective.
- **Baling Cardboard at the Recycling Center:** The County has a vertical downstroke baler staged at the County Warehouse that is used periodically to bale cardboard from the

County “Meals on Wheels” program. The bales are loaded into a County box truck using a forklift and delivered to Greenstar in Highspire.

For many recycling programs, baling cardboard is an efficient way to consolidate and process cardboard. Baled cardboard typically yields \$20 to \$40 per ton more than loose cardboard. After moving the baler to the Recycling Center, cardboard could be dropped off by residents and/or business and staff would bale it and store cardboard until a trailer-load quantity is produced. Vertical balers process bales slowly compared with horizontal balers and may not be as efficient or cost effective, primarily because they are labor intensive.

Initially, GF recommends that the County move the vertical baler to the Recycling Center to be used as needed to compact overflow cardboard that exceeds the capacity of the blue bins in the Recycling Center drop-off area. Any cardboard generated by Recycling Center operations could also be baled. On an ongoing basis, the County should assess cardboard volume, staffing resources, and cardboard market values and make adjustments to maximize program performance and economics.

Based on our review of several cardboard alternatives, the County should consider utilization of roll-off containers for collecting cardboard and baling of cardboard to manage cardboard at the Recycling Center that exceeds the capacity of the blue bin program. In the future, the County should investigate the feasibility of using a more efficient horizontal baler, which can be purchased used, or refurbished at a greatly reduced price. A horizontal baler would work most efficiently with a Bobcat loader to assist with the movement of loose cardboard, feeding the baler, and bale placement. GF recommends selling cardboard on the spot-market. The County should consider short-term contracts and/or contracts with a floor price and/or based on a consumer price index when cardboard pricing recovers.

## 6.0 PROPOSED COUNTY RECYCLING CENTER DROP-OFF PROGRAM

The County wants to expand its recycling effort using a phased approach, where additional recyclables can be added to the program as feasible. GF agrees with the County’s “phased approach” to slowly increase recycling options, continually evaluating resources and economics. As proposed, the County Recycling Center **Drop-off area** will include the blue bin Haul-All system for recovery of the following materials:

- **Cardboard**
- **Newspaper**
- **Plastics (#1 and #2)**
- **Aluminum and bi-metallic cans**

The blue bins will be located with the fenced and paved yard area that surrounds the Recycling Center. Containers will be serviced using Haul-All collection vehicles and this service location will be incorporated into the haul routes for servicing the other nine County drop-off sites. The

bins will be located and configured in the yard to allow easy pickup by the County drivers, while not impacting other proposed recycling activities.

Recyclables proposed/considered for the County **Recycling Center building** will include the following:

**Electronics** – The County proposes to allow residents to drop-off electronics on specified days at the Recycling Center. Electronics would be unloaded from vehicles by residents with assistance from County staff as needed into gaylord boxes. The County proposes to stage a box truck supplied by the electronics vendor. The trailer would be loaded with electronics placed on skids in gaylords as material enters the facility to keep the Recycling Center floor free of materials.

**Books** – Books will be collected in gaylord boxes and stored either inside the Recycling Center or in a trailer that is staged for collection of books by the market/processor. The County has not yet confirmed a market for books. Cougles Recycling, Inc. in Hamburg, Pennsylvania accepts books but has not provided details to the County on a marketing arrangement. Cougles Recycling is over 50 miles away. Greenstar in Highspire may collect books in the future, but due to the recent market decline, does not know when, or if they will collect books.

It is noted that styrofoam is tentatively being considered by the County for recycling in a later phase of the program. Dart Container Corp is located in Leola, Pennsylvania and can accept styrofoam.

## 7.0 SITE VISIT OF PROPOSED COUNTY RECYCLING CENTER DROP-OFF

GF visited the Dauphin County Recycling Center on September 3, 2008 and again on November 13, 2008. GF conducted the site visits and took photographs (see **Site Photos** in the **Appendices**) of the Recycling Center, equipment assets, parking lot area and the transfer trailer loading area operated by the City of Harrisburg in the area between the Harrisburg Incinerator and County Recycling. Refer to the **Preliminary/Final Land Development Plan** prepared by Navarro & Wright, as revised by GF to illustrate existing and proposed features that is attached at the end of this Report.

GF made the following observations during our field investigations of the proposed Recycling Center that will be used as a public recyclables drop-off operation:

- The paved lot surrounding the Recycling Center is sufficient in size to accommodate a blue bin public drop-off area for the proposed materials.
- The current location of the blue bins may restrict tractor trailer access/egress to the loading zone/bays.
- Generally, the facility has a number of design features (e.g. walls, pits, space limitations) that restrict the efficient flow, storage, processing and management of recyclable materials. These features will limit the working space, handling

efficiency and processing/handling options, and therefore, processing procedures must be well-planned and organized.

- There are several open pits (intended for equipment, conveyors, etc.) in the facility that are safety and operational hazards. The largest pit located in the central area of the Recycling Center limits the amount of space available at the only part of the building with a ramp for vehicles to enter the facility. Other pits in the small portion of the facility may also have to be covered for safety and to enable recycling or re-use activities.
- The slope paving near the docks that abuts the concrete slab has failed, leaving a depressed opening that is approximately 4'w x 3'w x 4' deep that goes beneath the loading zone/concrete slab (see attached **Proposed Features** drawing for approximate location).
- A single transfer trailer is staged adjacent to the incinerator. The trailer is a consolidation point for City-generated commingled recyclable materials including plastic, glass, cans, newspaper and mixed paper. These materials are transported to Greenstar's recycling facility in Northampton, Pennsylvania.

## 8.0 ELECTRONICS RECYCLING

GF contacted UNICOR in November 2008 to determine the arrangements that could be provided to Dauphin County for their proposed electronics recycling program. Federal Prison Industries (trade name UNICOR) was created in 1934 by an act of Congress with the mission of employing and training individuals incarcerated in the Federal Bureau of Prisons. UNICOR has a number of recycling facilities in the U.S. including a facility in Lewisburg, Pennsylvania. UNICOR is ISO Certified and Certified through the International Association of Electronic Recyclers. Based on GF's conversations with UNICOR, they are willing to recycle all of Dauphin County's electronic scrap under the same arrangements offered to landfill operations in the state of PA:

- The County would be responsible for cost of shipping the material to UNICOR, but not charged per pound for electronics like most vendors.
- The County would be responsible for a \$10 fee for all televisions over 19".
- There will be no other tipping, recycling fees or hidden costs.

There will be a cost for hauling electronics to UNICOR. Watsonstown trucking often works with UNICOR and quoted a price in November (2008) of \$425 per load for the County. To join the program, the County will need to enter into a Memorandum of Agreement (MOU) with UNICOR.

### 8.1 Clinton County Solid Waste Authority Electronics Program

For reference, the Clinton County Solid Waste Authority (Authority) implemented an electronics drop-off program in 2006. The County has approximately 40,000 residents and, upon request,

businesses can participate in the program. The Authority anticipates recycling 60 tons of electronics in 2008. This equates to approximately (12) 100 cubic yard trailers. The Authority fits 18 to 22 gaylord boxes per trailer. The Authority estimates they spend about 5 hours per week on handling and loading electronics.

## **9.0 CONCLUSIONS AND RECOMMENDATIONS**

The assumptions and considerations established at the beginning of this evaluation are described in Section 2.1. GF notes that the value for recyclable commodities fell dramatically during the course of this program evaluation and the declining market prices and market instability influenced some of our findings and recommendations.

### **9.1 Conclusions**

The County Recycling Center was constructed in 2005 and is designed to process 50 tons of recyclables per day. Lacking the recyclables quantities from the local area to operate this facility as a fully functioning processor, neither the County nor recycling vendors have had a solution for operating this facility. Consequently, the Recycling Center is unused, except as a building for storage of miscellaneous County supplies, furniture and police department equipment. The largest portion of the Recycling Center cost was paid for by Act 101, Section 902 Grant Funding through PADEP. The Recycling Center cost nearly \$1,500,000. If the Recycling Center is not used to process recyclables in a manner acceptable to PADEP, the County is at risk to pay back all, or a portion of, the Recycling Center grant.

GF has reviewed other scenarios where municipalities and authorities have paid back PADEP and/or relocated unused recycling equipment that was previously funded through Act 101 Recycling Grants. GF anticipates that the City will be required by PADEP to flow several recyclable commodities through this facility in support of an enhanced County public recycling program. To begin utilizing this facility in a capacity that justifies the financial investment of the Recycling Center, the County will need to commit financial and staff resources annually to this operation. This is a difficult conclusion at a time when recyclables market values have plummeted significantly along with the global financial crisis.

It will be important for the County to begin recycling activities at the Recycling Center early in 2009, including consolidation and collection of recyclables inside the Recycling Center building and use of the paved area surrounding the Recycling Center as a drop-off recycling site using the blue bins and V-Quip trucks. PADEP is supporting the County in identifying a workable solution, including approval of this Study. It has not yet been clarified by PADEP what level of recycling efforts will be acceptable in terms of positioning the County to avoid payback of some or all of the Recycling Grant to PADEP.

Because the Recycling Center will not be operated as originally designed, there are space limitations, safety hazards, and the current floor plan limits receiving, handling, loading and the overall process-flow of materials. The County will need to be creative to enable efficient and safe use of the building's limited and awkward layout. GF has offered several recommendations related to material handling at the Recycling Center in the Recommendations section.

GF agrees fully with the County’s plan to implement these Recycling Center initiatives in a “phased” approach, but notes that County “phases” should be accompanied by a budget and plan for allocating adequate resources to meet specific objectives and timelines that have been thoughtfully derived. From our assessment of the County’s utilization of its recycling program assets, there are opportunities to improve the efficiency of existing County drop-off recycling activities. Improving efficiency where County staff and labor are used currently can free staff resources for the Recycling Center. Since there are multiple recycling alternatives and markets for each commodity, the County will need to investigate alternatives carefully.

## 9.2 Recommendations

GF has evaluated the County recycling program and assets and provided analyses and recommendation within the body of this Report. As summarized, GF recommends the following:

### General Recommendations

**Phased Approach:** The County should develop a concise, three-year phased approach for implementing the enhanced County Recycling program that integrates the expanded Recycling Center program initiatives. Recyclable materials/programs, budgets, labor, schedules and other operational needs should be outlined. As a general guideline, the County should limit the number of days and hours that programs are made available to the public as new programs are implemented. This approach will facilitate “ramp up” and controlled growth of the enhanced program so that resources can be effectively allocated without undue operational burdens. It also becomes difficult to tell the public that a program will be open on fewer days, after a more frequent schedule was originally advertised/implemented.

The County should work closely with PADEP to ensure the proposed phased approach is in line with PADEP’s perspective concerning the Recycling Center operation. The County should request guidance from PADEP as needed.

**Profit and Loss (P&L) analysis:** To improve the County’s recycling market selection process, it is recommended the County calculate all hauling, labor, benefits and other costs (e.g. annual maintenance costs) associated with the V-Quip collection vehicles and determine the “cost per mile” for hauling recyclables. For every market evaluated or used, the County should use the cost per mile to determine and compare transportation costs to different market locations. The County should then estimate the revenue potential for each commodity and each market by using the current rate. This (or a similar) P&L screening should be a guideline for the County.

**Commercial Recycling of Cardboard and Office Paper:** In addition, GF recommends the Recycling Center program also be utilized as a recycling outlet for the commercial sector. Because office paper and cardboard are the “low hanging fruit” generated from most businesses, it is recommended the County accept these two commodities.

**Commingling/Mixing Commodities:** GF recommends the County evaluate the economic feasibility of commingling some recyclables materials to reduce transportation or other operational

costs. Although the drop-off program in the blue bins is a source-separated program, it can be more cost effective to consolidate and mix certain commodities in a high-volume transfer trailer for delivery to market. This would not necessarily require changing the source-separated format of the blue bin system. If the County desires recycling data (tons) for individual commodities after recyclables are mixed, GF recommends the County work with the recyclable processors who will provide a breakdown the commingled recyclables into their respective fractions. The separation or collection of recyclables by type for the purpose of better data is not a recommended approach for structuring or thinking about cost effective strategies for recycling.

**Shared Recycling Arrangements with the City of Harrisburg:** The County should work with the City of Harrisburg Public Works Department to evaluate and consider recyclables consolidation arrangements that could improve recycling program economics and program performance. The City operates a low-tech recyclables transfer operation adjacent to the Recycling Center and Harrisburg Incinerator. The County should give serious consideration for using this facility to place some of its recyclables (e.g. plastics) into this transfer trailer along with City recyclables to reduce program costs by eliminating hauling and labor costs incurred while delivering to market. The County should test dump a small amount of material at the transfer facility to determine if it can be done safely. Combining County and City recyclables may also place both entities in a better position to negotiate market arrangements. The City indicated the County may use the truck scale at the wastewater treatment plant to weigh recyclables as needed.

**County Staff Allocation:** Due to the limited availability of County Staff and the need to use some County Staff at the Recycling Center as this program evolves, adjustments should be made to County drop-off collection routes (and market utilization) that will enable one or more drivers to assist with Recycling Center activities as needed. The County should work closely with the drivers to determine a workable solution and schedule.

**Recyclables Transfer Station Retrofit:** Based on our site visit observations, it appears that it is feasible to retrofit the City recyclables transfer facility so that a second transfer trailer could be loaded (refer to attached Figure). The second trailer would be staged perpendicular to the current trailer. A retention wall (e.g. railroad ties or concrete barrier), backfilling and retrofits to the entrance that allow adequate room for dropping and servicing would be required. GF recommends the County work with the City to pursue this retrofit and shared use of the transfer area. Because many recyclables are high-volume and little weight, the concept of using some form of compaction trailer should be considered at the transfer area. This transfer area could be utilized by the County and/or the City as needed to consolidate recyclables for efficient transportation, while generally increasing the recycling program options. Recyclables would not necessarily need to be commingled. For example, the County could fill the trailer with plastics and eliminate the need to run plastics to market after each collection day.

**Dauphin County Municipal Waste Management Plan (Plan):** As the County further defines and implements an enhanced program utilizing the County Recycling Center, the County should reflect these programs in the County's Plan, which calls for development of recycling goals and strategies to meet 35 percent recyclable diversion rates and Act 101 requirements.

## County Recycling Center and Drop-off Recycling Area Recommendations

### Blue Bin Drop-off Recycling Area

- **Collect the following materials as proposed by the County:**
  - Cardboard
  - Newspaper
  - Plastics (#1 and #2)
  - Aluminum and bi-metallic cans (mixed)
- **Limit hours and days open to the public:** Due to staffing limitations and to “ramp up” the program, the County should limit the number of days the Recycling Center and drop-off area are open to one to three days per week. This gradual start will allow the County to adjust to the program and facilitate the allocation of limited staff resources.
- **Use signage** at the entrance of the facility (and other locations where public instruction will facilitate correct procedures) describing the drop-off recycling program requirements and hours of operation.
- **Reposition the blue bins** from the current location near the center of the paved area to along the fence to the south; placing them parallel to the fence with adequate room for V-Quip servicing. This location will not conflict with trucks accessing the dock and loading area of the Recycling Center.

### Recycling Center Building

- **Electronics Recycling:** Implement an electronics recycling program allowing residents to drop-off electronics at the Recycling Center on specified days and times. The County should add a rack system inside the Recycling Center so that electronics placed in gaylords on skids can be stored/stacked neatly prior to being loaded onto a trailer that could be staged at one of the Recycling Center loading docks. GF recommends the County use UNICOR for electronics recycling. UNICOR is a Federal electronics recycling program with a processing location in Lewisburg, Pennsylvania. UNICOR has a reputation as an environmentally responsible processor. UNICOR will offer electronics recycling at no cost with the exception of a \$10 fee for TV’s over 19”s. The County can secure UNICOR via a Memorandum of Understanding (MOU). If the County elects to accept electronics from businesses, this will have to be done on a limited basis, perhaps for a fee, to ensure the volume of material can be operationally and economically feasible to handle.
- **Commercial Office Paper:** GF recommends the Recycling Center building be used to collect office paper from businesses. Office paper could be consolidated into gaylord boxes on skids and loaded onto a delivery truck or trailer for delivery to a local market (e.g. Harrisburg Wastepaper). Office paper accepted for drop-off by businesses should be limited to specified/scheduled days.
- **Commercial Cardboard:** GF recommends the Recycling Center building accept cardboard from County businesses. Depending on the cardboard volume received, the

County will have to make decisions to manage this material loose and/or baled. Refer to the cardboard analysis and alternatives reviewed in Section 5.3 of this Report.

- **Re-use:** In addition to “recycling”, GF recommends the County evaluate use of the Recycling Center for “re-use” of certain items on specified days. Many recoverable items can be re-used, arguably a more environmentally responsible process than traditional recycling. The County could consider re-use of books, certain electronics and peripherals, textiles (i.e. clothing) and/or other items. After the re-used items are collected, the County could host re-use days when the public would be invited to take re-used items or possibly the County could consolidate materials then work with other distributors (e.g. Salvation Army). If re-use is considered, GF recommends the smaller portion of the Recycling Center building on the southwest end of the facility be considered for this function. For re-use programs, a sign-off program that frees the County of liability should be implemented under the guidance of the County solicitor.
- **Paving Repair:** Prior to using the loading docks, the County should repair the hole beneath the loading zone/concrete slab where the asphalt has caved. The County should determine if the hole may be a result of a damaged stormwater pipe that is conveying the asphalt, dirt and fill debris, or if a sinkhole is present. This determination will impact how the hole is repaired. A flowable fill/wet concrete may be a plausible solution and this costs about \$400 per yard. GF also recommends that the contact seam where the asphalt touches the concrete pad be sealed using a paving sealer. The sealer should have been applied originally and may have contributed to the formation of the hole.
- **Pit Covering:** There are several pits in the Recycling Center that were part of the original Recycling Center design, either for in-floor equipment or other purposes. It is recommended these holes be covered to protect both worker safety and the safety of the general public. For the largest pit, which is located in the central portion of the recycling center and relatively close to the loading docks, it is recommended the County cover this pit with a reinforced steel slab that has the capacity to support vehicles and equipment. GF feels this large pit is a significant hazard and also inhibits the ability to effectively move material and/or equipment in the only area with an overhead bay door that includes a ramp that enters the facility from the outside.

### **Equipment Asset Utilization**

**Vertical Downstroke Baler:** GF recommends that the County move the vertical downstroke baler located at the County warehouse to the Recycling Center to be used as needed to compact overflow cardboard that exceeds the capacity of the blue bins in the Recycling Center drop-off area (and possibly to manage some cardboard accepted from businesses). Any cardboard generated by the Recycling Center or other County operations could also be baled. GF recommends the baler be located on the northwest wall opposite the loading docks (see attached drawing at the end of the Report). On an ongoing basis the County should assess cardboard volume, staffing resources, and cardboard market values and make adjustments to maximize program performance and economics.

**GF recommends the County sell the unused Podeva glass/can crusher** to another municipality, county, or authority so the crusher can be used in support of a sustainable public recycling program as originally intended by PADEP.

**GF recommends the County improve the utilization of V-Quip collection vehicles** (and County staff) through careful analysis of profit and loss associated with hauling routes and markets. Based on these periodic analyses, the County should adjust collection routes, generally reducing hauling distances as feasible.

### **Books and Styrofoam**

**GF does not recommend recycling styrofoam at this time:** Compared to managing other recyclable commodities, recycling styrofoam is operationally not practical because it takes up space and should be compacted. Styrofoam is not handled by most established processors because it is labor intensive and has little or no value, thus, it is cost prohibitive. A styrofoam recycling program could become more feasible in the future if markets, staffing resources, and other variables change. Due to styrofoam's volume, GF recommends compaction in some manner prior to delivery. Handling styrofoam will produce micro-sized styrofoam beads that require cleanup. Recycling styrofoam should be low priority.

**GF does not recommend recycling hard or soft cover books at this time:** The nearest market accepting books regularly (because they have a binding cutting machine) is Cougles in Hamburg, Pennsylvania about 50 miles away. The long hauling distance will create a considerable cost for this service, so book recycling should not be a priority at this time. If fiber and book recycling markets improve, this option could be reconsidered. As a general rule, GF recommends books be separated into soft and hard cover book categories to provide recycling and/or re-use program flexibility.

### **Education**

**Education Campaign:** GF recommends the County conduct a comprehensive publicity/education program, placing emphasis on the new recycling opportunities offered at the Recycling Center. Emphasis should be placed on targeting commercial sector establishments so that they are aware of new opportunities to recycle cardboard and office paper. It may be beneficial to conduct a waste and recycling survey of commercial establishments.

**Signage:** Clearly displayed signage should be used in all areas of the County's program where the public requires instructions to properly participate in the recycling and/or re-use programs.

**APPENDICES**

Recycling Program Assets Table

Site Photos – Dauphin County Recycling Center

Navarro & Wright Preliminary/Final Design Drawing Revised by GF; Existing/Proposed Features

## DAUPHIN COUNTY RECYCLING EQUIPMENT INVENTORY LIST

### Physical Condition

Item description (make/ model)	Quantity	Current Use	Condition (G-Good, F-Fair, P-Poor)	Capacity/thruput	Notes
Haul-All recycling collection vehicles	4	County Drop-off Recycling	G		4 - 5 miles per gallon.
(3) 2002 Ford F-750		County Drop-off Recycling	G	35 CY	4 - 5 miles per gallon.
(1) 2005 Freightliner		County Drop-off Recycling	G	35 CY	4 - 5 miles per gallon.
2002 Ford Box Truck	1	Used for in-house collections	G	na	
2002 F-350 Pick-up Truck	1	Used by Maintenance to visit sites to collect litter and also used to haul special event trailers	G	2.5 cubic yards	
Haul-All special event recycling trailers	2	Periodic Events	G		
Piqua Baler	1	Rarely used; stored at the County warehouse.	F		Will be moved to the Recycling Center. Has been maintained.
Prodeva can/glass crusher	1	Not in use	G (New)		County deemed it was not practical to use for current volume of materials and is looking for a place this can be used.
Haul-All drop-off bins	<b>82 total</b>	County Drop-off Sites			
	70 bins	8 bins at 8 sites and 6 bins at 1 site	F	4-6 cubic yards	
	2 bins	Harrisburg International Airport	F	4-6 cubic yards	
	2 bins	Farm Show Complex	F	4-6 cubic yards	
	8 bins	Recycling Facility	F	4-6 cubic yards	
95-gallon toters	(~)20	Used by Maintenance for in-house collection	G	95 Gallon	
Cluster Containers		Collect aluminum, plastic and trash at Fort Hunter, Dauphin Co. Courthouse, Dauphin Co. downtown and Dauphin Highlands Golf Course	F		

**Dauphin County Recycling Center - Site Photos – September 2008**



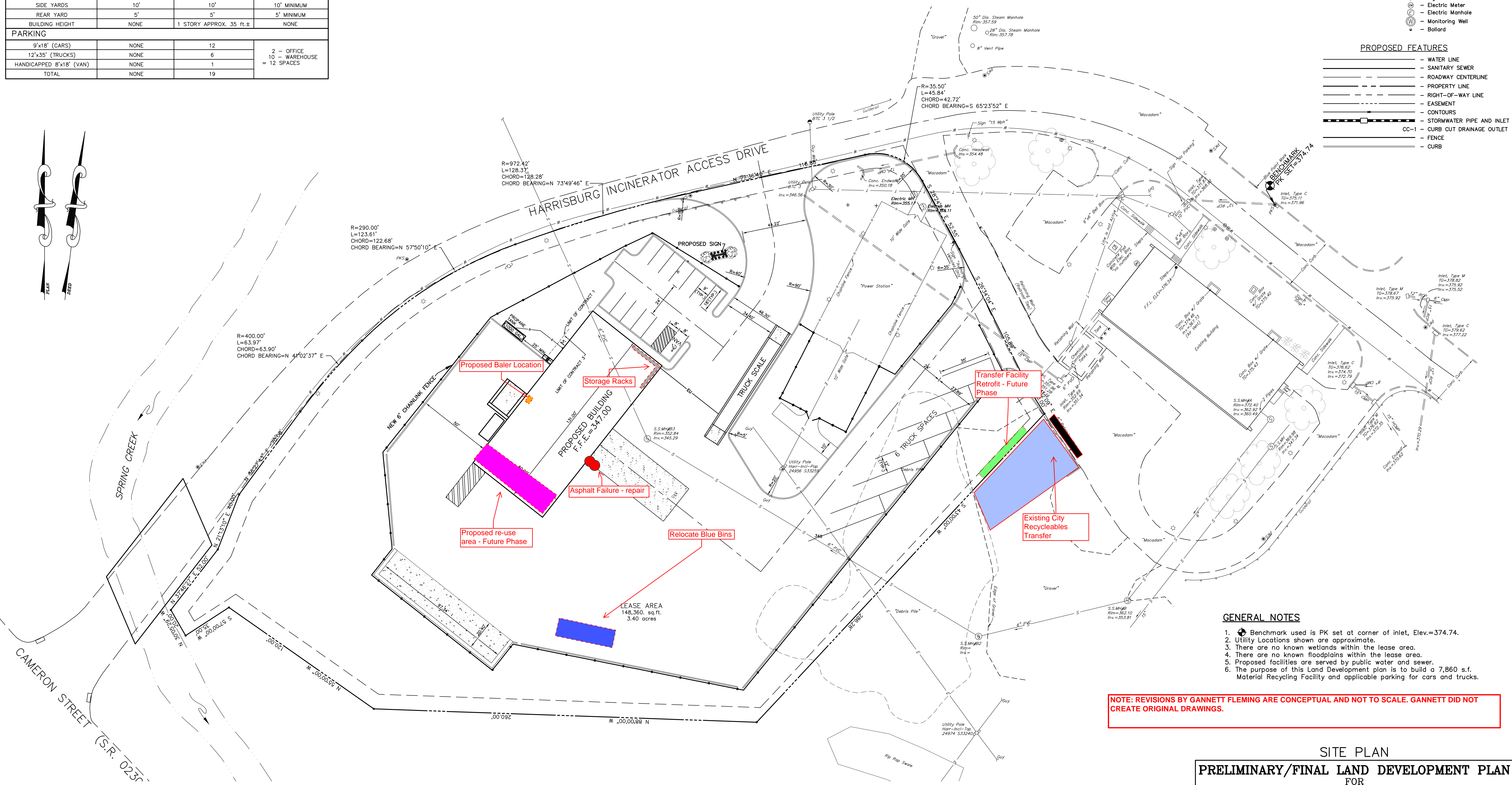
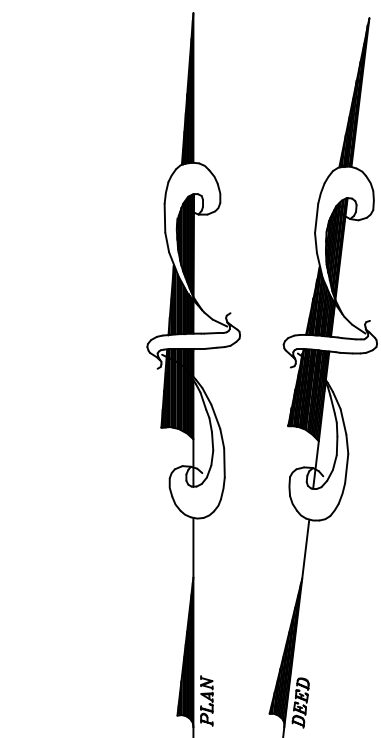


ZONING DISTRICT - HEAVY INDUSTRY ZONE (MH)

ITEM	EXISTING	PROPOSED	REQUIREMENT MIN. OR MAX.
<b>USE REGULATIONS</b>			
BUILDING/LOT USE	NONE	RECYCLING CENTER	ALLOWED
<b>AREA AND HEIGHT REGULATIONS</b>			
LOT AREA	2,590,552 sq.ft.	148,360 sq.ft./3.40 Acres	N/A
GROSS BUILDING AREA	NONE	7,860 sq.ft.	N/A
BUILDING/IMPERVIOUS AREA	NONE	76,534 sq.ft.	N/A
FRONT YARD	10'	10'	10' MINIMUM
SIDE YARDS	10'	10'	10' MINIMUM
REAR YARD	5'	5'	5' MINIMUM
BUILDING HEIGHT	NONE	1 STORY APPROX. 35 ft.±	NONE
<b>PARKING</b>			
9'x18' (CARS)	NONE	12	2 - OFFICE 10 - WAREHOUSE = 12 SPACES
12'x35' (TRUCKS)	NONE	6	
HANDICAPPED 8'x18' (VAN)	NONE	1	
TOTAL	NONE	19	

LEGEND

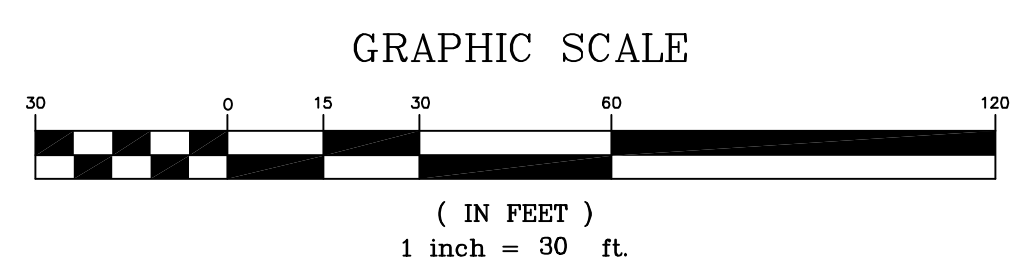
- EXISTING FEATURES**
- Right-of-Way Line
  - Fence
  - Edge of Stone
  - Edge of Macadam
  - Curb
  - Contours
  - Overhead Electric
  - Water Line and Valve
  - Sanitary Sewer and Manhole
  - Stormwater Pipe and Inlet
  - Utility Pole
  - Fire Hydrant
  - Light Post
  - Electric Meter
  - Electric Manhole
  - Monitoring Well
  - Bollard
- PROPOSED FEATURES**
- WATER LINE
  - SANITARY SEWER
  - ROADWAY CENTERLINE
  - PROPERTY LINE
  - RIGHT-OF-WAY LINE
  - EASEMENT
  - CONTOURS
  - STORMWATER PIPE AND INLET
  - CC-1 CURB CUT DRAINAGE OUTLET
  - FENCE
  - CURB



- GENERAL NOTES**
- Benchmark used is PK set at corner of inlet, Elev.=374.74.
  - Utility Locations shown are approximate.
  - There are no known wetlands within the lease area.
  - There are no known floodplains within the lease area.
  - Proposed facilities are served by public water and sewer.
  - The purpose of this Land Development plan is to build a 7,860 s.f. Material Recycling Facility and applicable parking for cars and trucks.

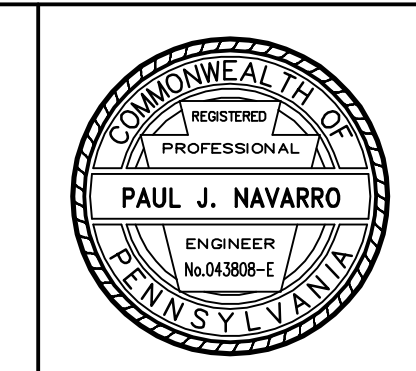
**NOTE: REVISIONS BY GANNETT FLEMING ARE CONCEPTUAL AND NOT TO SCALE. GANNETT DID NOT CREATE ORIGINAL DRAWINGS.**

3/25/04	ESPC AND PCSM PLAN MODIFICATIONS	VFS
DATE:	REVISIONS	BY:



Recorded in the office for Recording of Deeds, in and for Dauphin County Pennsylvania in  
 Plan Book \_\_\_\_\_ Vol. \_\_\_\_\_ Pg. \_\_\_\_\_ Date \_\_\_\_\_  
 Recorder \_\_\_\_\_

SHEET 4 OF 5 FOR RECORDING



**SITE PLAN**  
**PRELIMINARY/FINAL LAND DEVELOPMENT PLAN**  
 FOR  
**DAUPHIN COUNTY MATERIAL RECYCLING FACILITY**

City of Harrisburg	Dauphin County, Pa.
 NAVARRO & WRIGHT CONSULTING ENGINEERS, INC. 151 Reno Avenue New Cumberland, Pennsylvania 17070 (717) 441-2216	DRAWN BY: J.J.G. CHECKED BY: P.J.N. JOB NO.: 0503-PE56
DATE: FEB. 6, 2004	DRAWING NO.: 3P56-04
	SHEET 4 OF 11