

September 20, 2005

Judy Downs  
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471 Beach Road  
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**Subject: Update the Venango County Drop-off Recycling Program**

Dear Judy:

This letter summarizes R. W. Beck's suggestions for improving the Venango County drop-off recycling collection program. This effort was undertaken as part of the Recycling Technical Assistance program sponsored by the Pennsylvania Department of Environmental Protection (DEP) and the Solid Waste Association of North America (SWANA).

The report is divided into the following sections, which correspond with the Tasks provided in the scope. These sections are:

- Site visits,
- Program analysis,
- Benchmarking, and
- Conclusions and recommendations.

## Site Visits

Venango County is located in northwestern Pennsylvania, with a population of approximately 57,000 that is declining by 3 percent annually according to the Tri-County Solid Waste Management Plan. Venango County is part of the Tri-County Solid Waste District, which also includes Clarion and Forest Counties. The County is comprised of 31 municipalities, with two being mandated by Act 101 to provide curbside recycling services. These mandated municipalities are Oil City and City of Franklin. Each mandated municipality has contracted for curbside refuse and recycling collection with a private firm. The remainder of the County is served by private subscription collection service, with many of the haulers not providing curbside recycling collection service. Therefore, the County has established a drop-off recycling collection system.

The drop-off recycling collection system consists of seven (7) drop-off centers across the central and northern parts of the County. Currently, no drop-off centers are located in the southern part of the County. The current locations each have front load containers that are owned and serviced by Tri-County Disposal.

The materials collected at each drop-off center include:

- Aluminum cans;
- Steel/bi-metal cans;
- #1 PET plastic bottles;
- #2 HDPE plastic bottles;
- Three colors of glass bottles and jars; and,
- Old newspaper at the Sandy Creek drop-off center only. The center has an additional building where old newspapers are accepted.

We note that newspaper, corrugated cardboard, and other fiber typically provides the highest volume recycled material among curbside and drop-off programs. The fact that only one of the County's drop-off sites offers newspaper recycling suggests that Venango County's program will recover less than a typical drop-off program

R. W. Beck staff visited each of the drop-off sites with the County recycling coordinator on October 15, 2004. Information on equipment inventory and service frequency for each of the drop-off sites are shown in Table 1.

**Table 1  
 Venango County Drop-off Sites**

Drop-off Site Name	Site Equipment Inventory	Service Frequency
Two Mile Run County Park	2 – 10 Cubic Yard Frontload Containers	Twice per month <sup>1</sup>
Sugarcreek Borough	3 – 10 Cubic Yard Frontload Containers	Twice per month
Sandy Creek Township	3 – 10 Cubic Yard Frontload Containers	Twice per month
Polk Borough	2 – 10 Cubic Yard Frontload Containers	Twice per month
French Creek Township	3 – 10 Cubic Yard Frontload Containers	Once per week
Cherry Tree Township	2 – 10 Cubic Yard Frontload Containers	Twice per month
Pleasantville Borough	3 – 10 Cubic Yard Frontload Containers	Twice per month

<sup>1</sup> This site contains two locations. The site at the nature lodge is open to residents year round. This site collects mixed paper, tires and electronics, as well as aluminum cans, PET and HDPE bottles and three colors of glass bottles. The other site is seasonal, and only collects aluminum cans, PET and HDPE bottles and three colors of glass bottles.

Little signage exists to direct citizens to the drop-off site locations or to instruct citizens how to use them. However, some sites do have a sign with the name of the municipality or site. The frontload containers have the materials accepted in the program spray painted on the outside of each container. Surprisingly, even with the lack of signage, observations revealed little contamination.

The following figures show pictures from each of the drop-off sites.

Figure 1  
Sugar Creek Drop-off Site



Figure 1 highlights Sugar Creek's signage that prominently identifies the facility location, but includes minimal information on how materials are accepted at the facility.

Figure 2  
Sandy Creek Drop-off Site



Figure 2 shows the Sandy Creek drop-off center and the additional building that the Township uses for newspaper collection.

Figure 3  
Polk Drop-off Site



The drop-off recycling site in Polk Township is located at the State Hospital. There is evidence that some additional recycling is being performed at this location as seen in the pictures in Figure 3. It was unclear whether the tonnage generated from the program was included in the County recycling volumes. The County Coordinator plans to contact the State Hospital regarding this recycling program.

Figure 4  
French Creek Drop-off Site



Figure 4 shows the drop-off containers at the French Creek Township drop-off site. The Township has a sign in a plastic sheet taped to one of the containers that describes the program.

Figure 5  
Cherry Tree Drop-off Site



Cherry Tree Township, Figure 5, has the most detailed and permanent recycling program instructions posted on the side of the Township building. The sign is clearly visible from both of the containers. The containers were almost empty during the site visit, and it was not possible to accurately assess if contamination was greater or less than the other drop-off sites.

Figure 6  
Pleasantville Drop-off Site



The recycling drop-off site in Pleasantville Borough is shown in Figure 6. Although the containers appeared to have recently been emptied there was a significant amount of contamination in these containers. No signage or program instructions exist at this site other than the small labels on the containers.

Figure 7  
Burn Barrel and Contents



Figure 7 is an example of a backyard burn barrel. As we toured the County, it was apparent that backyard burn barrels are still prevalent in Venango County, and the materials targeted for recycling were included in the barrels.

## Program Analysis

R. W. Beck performed a desktop analysis of the County's recycling program. Areas that were specifically analyzed included recycling rates, the number of drop-off sites per square miles and per capita (drop-off ratios) and collection/processing costs.

As shown in Table 2, Tri-County Disposal reported that 1,533 tons of materials were recycled in 2003. Of this amount, approximately 88 tons was recovered through the drop-off sites.

Table 2  
 Tri-County Industries 2003 Tonnage Report

Municipality	Total Tons	Residential		Commercial	
		Drop-off	Curbside	Fiber	Commingled
Barkleyville Borough	18.71			18.71	
Cherrytree Township	20.78	20.78			
Cranberry Township	49.88			49.88	
City of Franklin	272.58		215.69	49.88	7.01
Frenchcreek Township	15.59	15.59			
Irwin Township	8.31			8.31	
Oakland Township/Two Mile Run	No data reported				
City of Oil City	1,045.02		1,018.00	27.02	
Pleasantville Borough	16.63	16.63			
Polk Borough	14.55	4.16	10.39		
Sandycreek Township	32.22	15.59		16.63	
Sugarcreek Borough	38.45	15.59		22.86	
<b>Total Tons</b>	<b>1,532.72</b>	<b>88.34</b>	<b>1244.08</b>	<b>197.45</b>	<b>7.01</b>

The Tri-County District Solid Waste Management Plan projected that 43,029 tons of solid waste would be generated in Venango County in 2003. Venango County reported to R. W. Beck that a total of 6,021 of waste was recycled in 2003, which yields a recycling rate of approximately 14 percent.

With respect to program costs, the County does not pay directly for any collection and processing costs associated with the drop-off recycling program. Rather, each municipality pays a flat \$100 per month charge to Tri-County Disposal, which covers both collection and processing<sup>1</sup>. In addition, it does not appear that any County funds are used to promote the drop-off sites.

Table 3  
Collection Costs

Drop-off Site Name	Estimated Annual Collection Charge
Oakland Township/Two Mile Run County Park	\$1,600
Sugarcreek Borough	\$1,200
Sandy Creek Township	\$1,200
Polk Borough	\$1,200
French Creek Township	\$1,200
Cherry Tree Township	\$1,200
Pleasantville Borough	\$1,200
Total Venango County	\$8,800

## Benchmarking

Four other Pennsylvania counties that currently have drop-off recycling collection systems were selected for the purpose of benchmarking against Venango County's drop-off program. These counties are Cambria, Centre, Mercer and Schuylkill Counties. However, it should be noted that an "apples to apples" comparison can not be made because each county is demographically different and calculate costs differently. However, this benchmarking does provide indicators that should be considered when evaluating Venango County's drop-off recycling program. The statistics for each drop-off program are shown in Tables 4 and 5.

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<sup>1</sup> The Two Mile Run Park has two drop-off sites where the six-yard containers are located, which results in a cost difference of \$400 compared to the other Townships.



Table 4  
 Benchmark Communities Recycling Rate, 2003

County	Population	Pounds per Capita per Year	Drop-off Collection Sites	Square Miles	Square Miles per Collection Sites
Venango	57,000	2.95	7	677	96.7
Cambria [1]	152,592	19.11	11	695	63.1
Centre [2]	135,758	38.3	100	1,108	11.08
Mercer [3]	120,293	14.85	8	672	84.0
Schuylkill [4]	150,336	35.68	20	779	39.0

[1] Data from 2003 monthly County recycling reports provided by Cambria County.

[2] Data from 2003 Centre County Recycling Department records as reported by Joanne Shafer.

[3] Data from 2003 Mercer County Recycling Department records as reported by Jill Bozer

[4] Data from annual reports provided by Schuylkill County.

As shown in Table 4, Venango County has the lowest pounds per capita drop-off recycling quantity of the five counties. Venango County is also the only county whose drop-off sites do not uniformly collect at least some paper grades. The exclusion of paper from the Venango County program is likely the single largest reason why recycling rates are the lowest among benchmark counties.

On the other end of the spectrum, Centre County has the highest per capita drop-off recycling rate at 38.3 pounds. This may be due to the density of the Centre County drop-off recycling program. Center County's program has 100 drop off sites within the 1,108 square miles or an average of one drop-off site per every 11.08 square miles. Similar to Venango County, all sites accept aluminum cans, bi-metal cans, #1 and #2 plastic bottles and three colors of glass containers. Unlike Venango County, all sites also accept newspaper and phone books, eight of the sites accept corrugated cardboard and four sites accept mixed paper. As expected, accepting a variety of fiber grades (paper) at each of the sites is a significant contributing factor to the high per capita recycling rate.

Table 5  
 Benchmark Communities Financial Analysis for 2003

County	Drop-off Collection Sites	Total Tons Collected at Drop-Off sites	Tons per Collection Site	Recycling Collection/Processing Cost	Cost per Ton Collected/Processed
Venango	7	84	12.03	\$ 8,800	\$104.54
Cambria	11	1,458	132.5	\$112,465	\$ 77.14
Centre	100	2,600	26.0	\$177,387	\$ 68.23
Mercer	8	893	111.6	\$109,139	\$122.22
Schuylkill	20	2,682	134.1	\$227,266	\$ 84.74

With respect to financial performance, Centre County has the lowest collection/processing costs at \$68.23 per ton. Centre County's low operating costs may be partially due to the County also operating the material recovery facility and not charging itself a tipping fee. However, Centre County is most likely experiencing significant "economies of scale" due to the large volume of recyclables collected and processed, as well as the density of drop-off sites on the collection routes.

Schuylkill County has the second highest per capita drop-off recycling rate at 35.68 pounds, and also has the second highest ratio of drop-off sites per square miles, with an average of one drop-off site per every 39.0 square miles. The 20 permanent drop-off sites accept old newspapers, magazines, office paper, cardboard, aluminum cans, bi-metal cans, #1 and #2 plastic bottles, and three colors of glass containers. Schuylkill County uses the Haul-All container system.

Schuylkill County's collection/processing costs are \$84.74 per ton, which falls in the middle of the benchmark communities. A contributing factor to Schuylkill County higher costs may be that the County uses private, out-of-County recycling processors, and often transports the materials to these processing facilities in County collection vehicles, which can decrease productivity and increase cost.

Cambria County also operates their drop-off collection program for recyclables using the Haul-All recycling container system. The drop-off recycling rate is 19.11 pounds per capita per year. Cambria County operates 11 permanent drop-off sites, with an average ratio of one site every 40.9 miles. All Cambria County sites accept aluminum cans, bi-metal cans, #1 and #2 plastic bottles and clear glass, but do not accept magazines and newspapers. The operating cost for this drop-off system is \$77.14 per ton. Cambria County uses the Indiana County MFR for processing their recycled materials. Indiana County is adjacent to Cambria County and the one-way travel time is approximately 30 minutes.

Mercer County operates 8 drop-off recycling centers using the Haul-All system, and has an annual per capita recycling rate of 14.85 pounds, which is the lowest of the benchmark communities. Mercer County also has the lowest ratio of drop-off sites per square mile. The County drop-off recycling program includes old newspapers, corrugated cardboard, magazines, metal cans, 3 colors of glass, and #1 & #2 plastic bottles. The local Council of Governments owns the collection trucks and collects the containers and hauls them to the Crawford County MRF for processing.

However, it should be noted that since 2003, Mercer County has increased the quantity of recyclables collected from 893 to 1,337 tons due to substantial education and awareness initiatives and a full year of operating with the Haul-All system

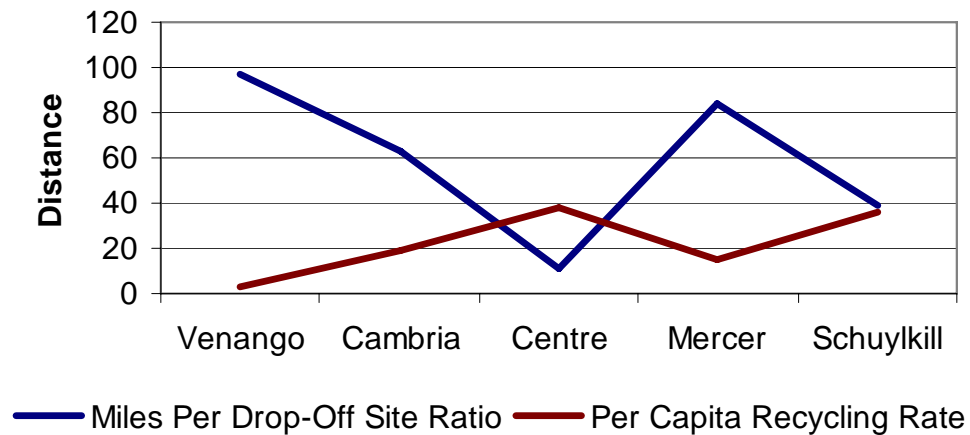
The Crawford County MRF had previously charged a tip fee combined with a rebate, but has since dropped the tip fee and now just pays a rebate on all tonnage processed. The rebate is based on market prices and fluctuates with the market. The operational cost for this drop-off system is now \$122.22 per ton collected. The reason for the higher cost per ton is most likely related to the low quantity of recyclables collected and the haul distance to the Crawford County MRF.

## Conclusions and Recommendations

### Recycling Rates

As demonstrated through the benchmarked communities and shown in Figure 8, as the square miles between drop-off sites increases, the pounds per capita recycling rate decreases.

Figure 8  
 Drop-Off Site per Square Mile Ratio versus Per Capita Recycling Rates



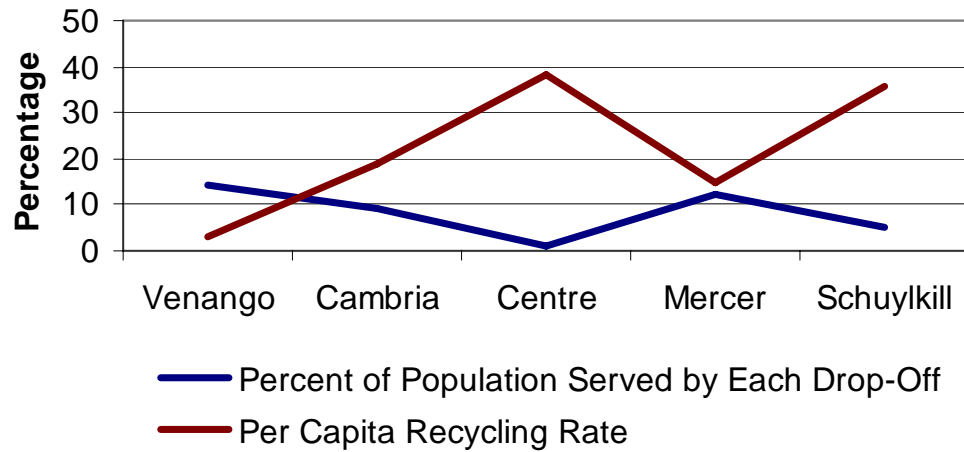
Since Venango County has the greatest distance between drop-off site locations and the lowest per capita recycling rate, R. W. Beck recommends increasing the number of drop-off site locations. Since population density also influences the number of drop-off sites that are necessary to optimize the performance of a drop-off recycling program, Table 6 identifies the percent of the population served by a drop-off site for each of the benchmark communities.

Table 6  
 Benchmark Communities Service Areas

County	Population	Pounds per Capita per Year	Drop-off Sites	Percent of Population Served By Each Drop-Off Site
Venango	57,000	2.95	7	14.29%
Cambria	152,592	19.11	11	9.09%
Centre	135,758	38.3	100	1.00%
Mercer	120,293	14.85	8	12.50%
Schuylkill	150,336	35.68	20	5.00%

As shown in Table 6 and Figure 9, as the percent of population served by each drop-off site increases, the per capita recycling rate decreases.

Figure 9  
Population Served versus Per Capita Recycling Rates



The Venango County drop-off system serves a population of 57,000 and encompasses 677 square miles. For Venango County to achieve the per capita recycling results of highest performing benchmark communities, Centre and Schuylkill Counties, R. W. Beck recommends that each drop-off site service approximately 5 percent of the Venango County population, meaning one drop-off site for every 2,850 residents. Also, the drop-off sites should be located within 11 and 40 square miles of population centers. Using these parameters, R. W. Beck recommends that Venango work with the following municipalities to establish new drop-off site locations.

**Table 7**  
**Additional Drop-Off Sites Recommended**

Municipality	Population	Square Miles	Number of Sites Recommended
Canal Township	1,008	24.5	1
Cornplanter Township	2,687	37.8	1
Cranberry Township	7,014	70.4	2
Irwin Township	1,309	30.2	1
Jackson Township	1,168	24.7	1
Plum Township	1,060	26.6	1
Rockland Township	1,346	49.1	1
<b>TOTAL</b>	<b>15,592</b>	<b>263.3</b>	<b>8</b>

R. W. Beck also assessed whether the current drop-off sites were adequate in terms of population served and distance from the population center. As shown in Table 8, they appear to be adequate.

**Table 8**  
**Current Drop-Off Sites**

Municipality	Population	Square Miles
Oakland Township/Two Mile Run County Park (Two Sites)	7,212 <sup>1</sup>	4.6
Sugarcreek Borough	5,331	37.4
Sandy Creek Township	2,406	17.8
Polk Borough	1,031	1.9
French Creek Township	1,605	24.3
Cherry Tree Township	1,543	36.8
Pleasantville Borough	850	1.0
<b>TOTAL</b>	<b>19,978</b>	<b>123.8</b>

<sup>1</sup> Located in the City of Franklin

Based on this analysis, if Venango County adds the additional drop-off sites identified in Table 7 to the current drop-off sites shown in Table 8, the County would have a total of 16 drop-off sites that serve 35,570 of the 57,000 Venango County residents.

Applying the average tons per sites, 12.03, to the 16 drop-off sites, yields a drop-off recycling quantity of 192 tons. However, R. W. Beck believes that through increasing the ratio of drop-

off sites per capita and square miles, adding fibers to the drop-off system and establishing a comprehensive education program, Venango County could achieve drop-off recycling rates that are similar to Centre and Schuylkill Counties, which ranges between 132 and 134 tons per site per year. If the expanded Venango County program performs at this level, tonnage collected through the drop-off system would range between 2,112 and 2,144 tons per year.

## Financial Performance

As shown in Table 9, the current drop-off recycling system is not over-priced in comparison to the benchmarked communities; however, the frontload collection system does limit the volume of material that can be collected. Therefore, as the County expands its drop-off system, it may want to re-evaluate the frontload system.

Table 9  
 Benchmark Communities Financial Analysis for 2003

County	Drop-off Collection Sites	Total Tons Collected	Recycling Collection/ Processing Cost	Cost per Ton Collected/Processed	Cost Per Site
Venango	7	84.18	\$8,800	\$104.54	\$1,257
Cambria	11	1,458	\$112,465	\$77.14	\$1,022
Centre	100	2,600	\$177,387	\$68.23	\$1,774
Mercer	8	893	\$109,139	\$122.22	\$13,642
Schuylkill	20	2,682	\$227,266	\$84.74	\$11,363

In general, three basic systems for the collection of drop-off recyclables exist:

- Compartmentalized roll-off containers;
- Single material containers such as the “Haul-All” system; and,
- Front-load containers.

Roll-off containers are available for recycling drop-off centers. These roll-off containers can be separated into a varying number of compartments that are each dumped separately at the processing facility. Containers are available in many sizes ranging from 10 to 40 cubic yards at a cost of approximately \$5,000. The larger size containers can reduce the number of trips to the processing facility provided the container is always full. Hauling full containers rarely occurs when the container is subdivided, however, and increasing the number of compartments also increases the chance that the containers will be hauled to the processor before all the compartments are full. This problem then increases the transportation cost for the drop-off centers. If the County wanted to operate such a collection system, a roll-off truck that costs approximately \$165,000, would also be required.

The second type of drop-off recycling system uses separate, specially designed containers that each stores a single type of recyclable. One widely used example of a system using this type of container is the Haul-All system. The container sizes range from 6 to 8 cubic yards and containers can be organized in a line next to each other, improving aesthetics and loading convenience at the sites. Haul-All also manufactures a collection vehicle that collects from the special containers and has two compartments. The capital cost is higher with this system, with a dual compartment truck costing \$120,000 and each container costing \$7,500. Most sites use 6 containers for a total container capital cost of \$45,000 per site.

The third type of drop-off recycling system, already in use by Venango County, uses a standard frontload container for each type of recyclable material. Containers typically range from 6 to 10 cubic yards and cost about \$650 each with the cost of a frontload truck at \$195,000. This system has similar challenges with regard to transportation cost as the Haul-All system. The front load truck can only carry one type of material at a time, making efficient transportation routing critical. However, this type of container works well in a system where the processor needs to accept the recyclables in two separated streams, fibers and commingled containers.

The processor may influence the type of collection system chosen based on how the materials need to be separated. Many processors require materials to be source separated. Some can accept two stream materials, one for fibers and the other for commingled containers. A few are now starting to accept single stream materials. Therefore, the collection system containers should be tailored to the number of sorts the users will have to perform at the drop-off site. The current Venango County processor has a dual stream MRF and therefore can accept commingled glass, aluminum and plastic containers.

Venango County has considered contracting with Crawford or Mercer County for the operation and collection of recyclables from the County's drop-off recycling sites. Both counties would transport the recyclables to the Crawford County MRF. Mercer and Crawford Counties currently use the Haul-All system to collect and transport recyclables. Thus, Venango County would most likely need to use the Haul-All System as well.

The Crawford County MRF is located approximately 28.4 miles from the City of Franklin and can accept source-separated recyclable materials. The travel times from Venango County to the Crawford County MRF are similar to the Mercer County travel distance to the Crawford County MRF. Thus, if Venango County contracts with one of these Counties rather than continuing to use Tri-County Disposal, the County could expect to encounter a similar cost per ton as Mercer County, which is \$122.22 per ton.

Also, the current drop-off system in Venango County requires the "host municipality" to incur the entire drop-off site costs. If the County desires to increase the number of drop-off sites without assuming the cost, the local municipalities will have to become committed to the recycling program. Venango County will need to work with the drop-off site contactor to obtain weight slips for each drop-off site location and annually apply for the PADEP Section 904 performance grant. Venango County will then need to develop a mechanism for distributing a percent of the Section 904 Performance Grants to each of the host municipalities to offset



operating costs and reward participation in the program. Alternatively, the County could help each municipality apply for a performance grant individually.

## Operational Recommendation

The current recycling program has low participation combined with a low capital and operating costs. The present collection cost is only \$1,200 per year per site with no capital cost. If the County decided to join with Crawford County for collection and processing, both the capital cost and the operating cost would increase dramatically. Based on these two facts, R.W. Beck recommends that the County continue to contract for recycling collection through Tri-County Industries on a year-to-year basis.

The number of drop-off sites should be increased to boost participation and tonnage. After the participation and tonnage have increased, the County could evaluate the new cost and tonnage data, in order to make a more informed decision about whether to continue its own recycling collection program using the Tri-County or Crawford MRF for processing or look to Crawford County to provide both collection and processing services.

## Education

Extensive education will be required if Venango County is going to measurably increase its recycling rate and aim to achieve the State's 35 percent waste reduction goal, even with an increase in drop-off site locations. For maximum impact from its new recycling education program, R. W. Beck recommends that the County "product brand" the drop-off recycling program. In marketing, "product branding" is defined as activities used to establish product identity and make connections with the consumer. For Venango County, the product is the drop-off recycling program and the consumers are residents. Based on our observations, the branding of drop-off recycling in Venango could be implemented through the following initiatives:

**Improve Signage** – It is essential that Venango County use one type of drop-off site signage that is easily identified at a distance to reduce resident (consumer) confusion. The signage should possess the following characteristics:

- Large lettering that is clearly visible from the expected observation distance;
- Bright, high-impact colors that draw attention while still blending in with the overall site surroundings and container coloration;
- Professional graphics that are easy to interpret and clearly reinforce the intent of the sign; and,
- Labels under each graphic that clearly identify acceptable items.

In addition to these general concepts, signage for drop-off recycling sites should always do the following:

- Clearly define the types of paper that are included in each container;
- Clearly define the types of plastic that are collected in the program;
- List some common contaminants that should be avoided; and,
- Instruct people to prepare their recyclables appropriately, by
  - Taking newspapers out of plastic sleeves;
  - Rinsing out their containers before placing them in the drop-off containers; and,
  - Removing and discarding caps to plastic and glass bottles.

Effective signage for recycling drop-off sites should avoid using too many words, or using overly technical language that may not be commonly known by drop-off site users.

**Standardize recycling throughout Venango County** -- Once Venango County has determined the “look” of its drop-off recycling program, a picture of the drop-off recycling signage and a message reminding residents to recycle should be located on all County-produced documents, and these documents should be placed in locations where residents purchase products targeted by the drop-off recycling program, such as grocery stores. Also, any promotional materials, such as a brochure, should use the same colors, graphics and font as the drop-off site signage so residents immediately create an association between certain colors or graphics and the County’s drop-off program.

## Summary

Through expanding the drop-off sites, establishing a comprehensive education program and increasing the types of paper that are collected in the expanded drop-off system, Venango County could annually recover an additional 2,111 tons and 2,144 tons of recyclables. When combined with the 1,533 tons of commercial and residential curbside recyclables that are annually recovered, a total of 8,132 to 8,165 tons of recyclables would be recovered, which would yield a Venango County recycling rate of approximately to 19 percent.

Beyond improving the residential drop-off recycling system, the County will need to implement the following initiatives before it could hope to achieve the 35 percent recycling goal:

- Expand commercial recycling in the county. The private sector haulers and businesses should be made aware of the advantages of a commercial recycling program for high grade office paper and old corrugate containers (OCC)
- Target yard waste for recovery;
- Encourage more municipalities to contract for curbside recycling;
- Work with the current recycling hauler to place containers for metal, glass, and plastic containers at restaurants and bars; and,

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- Eliminate backyard burning.

We appreciate the opportunity to work with the County on this project, and hope the suggestions provided in this report are helpful. Please do not hesitate to contact me at (301) 607-6428 if you have any questions.

Very truly yours,

R. W. BECK, INC.

Karen M. Luken  
Senior Director