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Subject: Recommendations for Improving Perry County's Drop-Off Recycling Program and Addressing Illegal Dumping

Dear Sally:

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), R. W. Beck has researched the drop-off recycling program and the illegal dumping activities in Perry County, Pennsylvania (County). R. W. Beck staff visited recycling collection sites and illegal dumpsites with the County Recycling Coordinator on April 26, 2005.

This report provides our findings and recommendations, and is divided into the following sections:

- Overview – Description of the current recycling collection system and an overview of illegal dumping activities in the County;
- Analysis – Identification of issues with the current recycling system and overall solid waste system that affects illegal dumping; and
- Recommendations – Conclusions and recommendations for improving the recycling program and addressing illegal dumping.

Overview

Recycling

Perry County is a rural county located in south central Pennsylvania with a population of 43,602 (2000 U.S. Census Bureau), a 6% increase from 1990. The County is comprised of small townships and boroughs, and many in the eastern portion of the County are bedroom communities to Harrisburg, PA. There are no municipalities within the County that have a population of more than 5,000 people, so none are mandated to have a source-separated recycling collection program¹. The County has a drop-off program for the collection of

¹ In 1988, the State of Pennsylvania enacted the Municipal Waste Planning, Recycling and Waste Reduction Act (Act 101) which requires municipalities with a population greater than 10,000 and municipalities with populations greater than 5,000 with population densities greater than 300 persons per square mile to establish and implement a source-separation and collection program for recyclable materials.

recyclable materials. Eight County recycling sites are located in the following seven communities:

- New Bloomfield (2 sites)
- Tyrone Township (Loysville)
- Duncannon
- Liverpool
- Rye Township (Marysville)
- Newport
- Millerstown

The map in Figure 1 below shows the distribution of the recycling centers throughout the County. (Harrisburg is shown as a reference point.)



Figure 1: Map of Perry County Recycling Collection Centers.

Each site is scheduled to be open one Saturday per month for two to four hours, depending on the site. Compartmentalized roll-off containers, shown below in Figure 2, are placed at each site on the collection day for the collection of recyclable materials.



Figure 2: Recycling Collection Center Compartmentalized Container.

The County owns ten (seven 30-yard and three 34-yard) roll-off containers and the contracted hauler, Perry County Metals, provides additional containers as needed. To discourage illegal dumping at the collection sites, Perry County Metals drops off the containers right before the collection day and removes them right after the collection day. Two of the sites are enclosed by a chain-link fence and have permanent signage; the others are located in open parking lots and do not have any signage.

The recyclable materials accepted at the County's collection sites include:

- Newspapers;
- Cans – aluminum and tin food/beverage cans, and tin foil;
- Glass – Green, brown, and clear glass bottles and jars, separated by color;
- Corrugated cardboard and boxboard; and
- Plastic Bottles - #1 (PET) and #2 (HDPE).

Each recycling site is open one Saturday per month and is staffed by citizen volunteers. The volunteers separate the recyclable materials and place them in the appropriate compartments of the roll-off container. Newspaper is stacked in farmers' trailers and is used as animal bedding after it is shredded by the farmers. The County contracts with Perry County Metals to collect the remaining recyclable materials and transport them to their facility. Perry County Metals then sells the recyclable materials to end markets.

The County has an agreement with Perry County Metals to pay them \$2,500 per month (\$30,000 per year) to place the roll-off container(s) at the site before the collection day, collect the

container(s) after the collection day, and transport the materials to Perry County Metals' recycling facility/transfer station in New Bloomfield. Perry County Metals retains any revenue from the sale of the recyclable material. The \$2,500 per month flat fee paid to Perry County Metals began in March of 2005. Previously, the County paid Perry County Metals \$2.00 per mile which averaged approximately \$1,300 per month or \$15,600 per year. The recycling transportation costs had been paid from funds collected from a \$1.00 per ton surcharge on Perry County garbage collected at MSW disposal facilities. The \$1.00 per ton charge did not generate enough revenue to cover the increased costs requested by Perry County Metals, so the County recently increased the surcharge from \$1.00 to \$4.00 per ton, effective June 1, 2005.

Illegal Dumping

Residents in Perry County are not mandated to subscribe to or contract with a collection company for the removal of municipal solid waste (MSW). A substantial number of residents have burn barrels on their property (see Figure 3) and burn their own garbage. Often, the ash (Figure 4) and non-burnable items are thrown behind the burn barrel or thrown in roadside ditches and in wooded areas throughout the County. Figure 5 shows an illegal dumpsite containing tires and furniture.



Figure 3: Typical Burn Barrel.



Figure 4: Ash from Burn Barrel.



Figure 5: Illegal Dumpsite.

In early 2005, the County conducted a survey and identified 41 illegal dumpsites located throughout Perry County. A map of the illegal dumpsites is shown in Figure 6 below.

Perry County Illegal Dumpsites

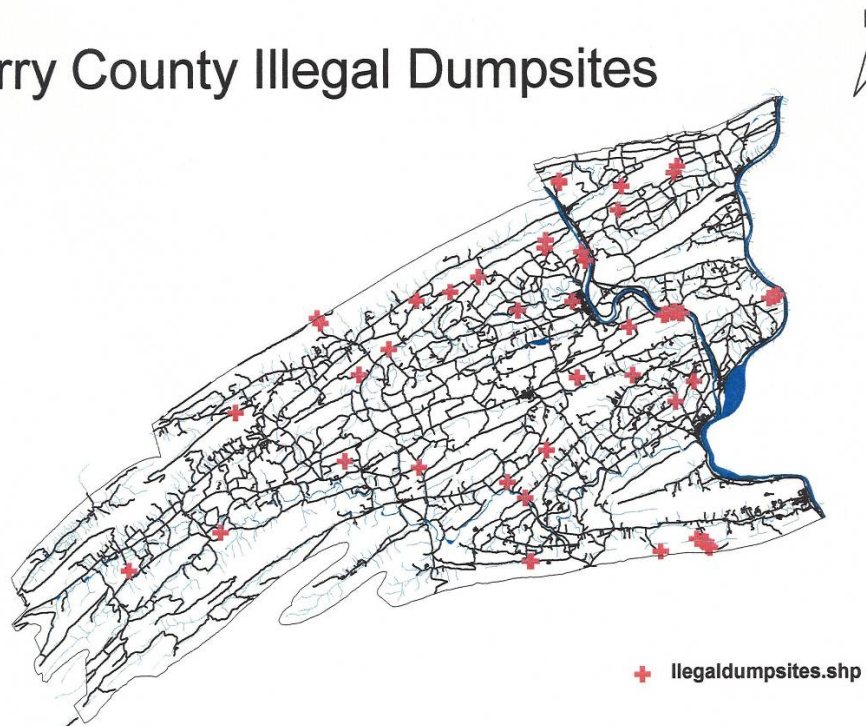


Figure 6: Map of Illegal Dumpsites in Perry County.

Annual cleanup events or amnesty days which provide residents disposal options for old appliances, furniture, and other large, bulky, or problem materials, are not offered County-wide which may account for some of the illegal dumping. However, fourteen of the thirty townships and boroughs do offer cleanup events and the County publishes a brochure that instructs residents of how to properly dispose of/recycle problem materials such as tires, used motor oil, batteries, scrap metal, appliances, etc.

Analysis

Recycling

Drop-off Sites

The quantities of recyclable materials collected in Perry County and the revenue received from the DEP's Act 101 Section 904 Recycling Performance Grants for the last six years are shown below in Table 1.

Table 1
Quantities of Recyclable Materials Collected in Tons and
Revenue Received from Recycling Performance Grants
Perry County, PA

Year	1999	2000	2001	2002	2003	2004
Tons	326	n/a	133	348	504	696
DEP Revenue	n/a	n/a	\$714	\$2,087	\$3,250	n/a

n/a = data not available

The County is showing improvements in the tonnage recycled each year. The revenue received from the DEP's Act 101 Section 904 Recycling Performance Grants will increase as the amount of materials collected for recycling increases.

Even though the County is showing improvements in the tonnage of recyclable materials collected, the 2004 recycling tonnage of 696 tons is considerably lower than the national average. With a population of 43,600, this equates to an average of 31.9 pounds per person per year, or 2.7 pounds per person per month. The national recycling rate is approximately 1.04 pounds per person *per day* or approximately 31 pounds per person, per month².

Table 2 lists the tons of recyclable material collected in the County in 2004, by material type.

² Source: U.S. Environmental Protection Agency report, "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2003".

Table 2
2004 Recyclable Materials Collected
Perry County, PA

Material	Tons
Residential:	
Newspapers	10.0
Corrugated Cardboard	107.1
Aluminum Cans	4.3
Bi-Metal Cans	53.5
Commingled Plastic and Glass	43.3
Residential Total:	218.2
Commercial:	
Corrugated Cardboard	466.4
Other Plastics	11.1
Commercial Total:	477.5
Total	695.7

The majority of the drop-off sites are located in the eastern portion of Perry County, which coincides with the majority of the County's population. Statistically, as the number of recycling sites per square mile increases, so does the amount of recyclable materials collected. The convenience of the recycling sites for the residents (i.e., the fewer miles they have to drive in order to recycle) has a direct effect on participation and quantities collected.

In April of 2005, R. W. Beck completed a SWANA/DEP recycling technical assistance project for Venango County, Pennsylvania. As part of that project, four Pennsylvania counties with drop-off recycling collection systems were benchmarked to compare to Venango County in terms of recycling rates, the number of drop-off sites per square mile, and costs per ton to collect and process. The results of that benchmarking task are shown below in Table 3, with the addition of Perry County statistics for comparison purposes.

Table 3
Communities with Drop-Off Recycling Collection Systems¹
2003 Recycling Rate Per Capita and Number of Sites per Square Mile²

County	Population	Pounds per Capita per Year	Number of Drop-off Collection Sites	Square Miles	Square Miles per Collection Sites
Perry	43,600	10.0	8	554	69.3
Venango	57,000	2.95	7	677	96.7
Cambria	152,592	19.11	11	695	63.1
Centre	135,758	38.3	100	1,108	11.1
Mercer	120,293	14.85	8	672	84.0
Schuylkill	150,336	35.68	20	779	39.0

¹ All sites accept aluminum cans, bi-metal cans, #1 and #2 plastic bottles, and three colors of glass. Venango County is the only county that does not collect newspaper. Other counties provide limited collection opportunities for phone books, corrugated cardboard, and mixed paper.

² Perry County's data is from 2004.

Perry County's recycling rate (pounds per capita per year) is at the low end of the benchmarked communities. It is likely that Venango County's exclusion of paper collection from its program is the reason why its recycling rate per capita was the lowest of the benchmarked counties. Centre County had 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 sites. 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 square miles. Also, Centre County's sites are open 24 hours per day, 7 days per week (as are most of the other counties' drop-off sites). Of the six counties, two had less drop-off sites per square mile than Perry County (Vanango and Mercer).

With respect to financial performance, when compared to the benchmarked communities, Perry County has the highest collection/processing costs at \$137.61 per ton, as shown below in Table 4. Centre County's costs were also fairly low at \$68.23 per ton which 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 also experiencing significant economies of scale due to the large volume of recyclable materials collected and processed, as well as the density of drop-off sites on the collection routes.

Table 4
 Benchmark Communities Financial Analysis for 2003¹

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
Perry	8	218	27.3	\$30,000	\$137.61
Venango	7	84	12.0	\$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

¹ Perry County's data is from 2004.

In comparing the type of drop-off system used by the benchmarked communities, Cambria, Mercer, and Schuylkill Counties all use the “Haul-All” brand recycling container system, as shown in Figure 7. Venango uses front-load containers and Centre County uses compartmentalized containers.



Figure 7: Haul-All Recycling Collection Containers in Cambria County, Pennsylvania.

Perry County Metals

Although residents are asked to separate recyclable materials and the volunteers take the time to ensure the materials are placed in the correct compartment on the roll-off container, it appears the materials are not placed in specified holding areas at Perry County Metals, as depicted in Figure 8. Most recycling/transfer facilities place each recyclable commodity into its own bunker or holding area to keep it free from contaminants and for ease in loading when it is time to bale and/or transport the materials to end markets.



Figure 8: Recyclable Materials at Perry County Metals.

Figure 9 below shows a pile of glass as dumped right out of the roll-off, without distinct separation by color.



Figure 9: Glass at Perry County Metals.

Glass is more difficult to market when the colors are commingled, unless there is a local market for mixed glass to be used as road aggregate or as landfill cover. Glass is only recycled back into new glass bottles and jars when it is marketed by color or it goes to a materials recovery facility (MRF) that has automated, fiber optic sorting. Glass in general is not a high-paying commodity, but in sufficient quantities, it can provide moderate revenue. Earlier this year, average prices for flint (clear) glass were \$26 per ton and \$11 per ton for amber (brown) glass³. Some end users charge for taking green glass, but most will take it at no cost. Mixed glass is generally not a revenue-generating commodity.

³ Source: Waste News, April 11, 2005, New York region average pricing.

Public Education

Perry County publishes the recycling collection schedule in a local newspaper every 4 to 5 weeks. Also, two recycling brochures are available to residents at the drop-off collection sites: one lists the recyclable materials that are collected at the recycling sites and how to prepare the items, along with the monthly drop-off schedule, and the other brochure lists locations for the recycling of problem materials such as tires, used motor oil, batteries, scrap metal, appliances, etc.

The County also posts recycling information on its website:

http://www.perryco.org/perry/lib/perry/PERRY_COUNTY_RECYCLING_SITES.doc.

Burn Barrels

Materials that are targeted for recycling are often found in burn barrels. Figure 10 below, taken during R. W. Beck's site visit to Perry County, shows home office paper/catalogs/magazines in a burn barrel. Although currently not collected in the County's program, this grade of paper is a revenue-generating commodity in most markets. It is highly likely that other recyclable materials such as newspapers and cardboard are commonly burned in backyard barrels.



Figure 10: Backyard Burn Barrel.

As mentioned previously in the Overview section of this report, a substantial number of residents have burn barrels on their property. At least one small community in Perry County has a community burn barrel for residents to use.

According to a Pennsylvania DEP Fact Sheet on Residential Open Burning in Pennsylvania⁴, the practice of burning household waste is legal under Air Quality regulations. Open burning is

⁴ Link to DEP Fact Sheet:

<http://164.156.71.80/VWRQ.asp?docid=0442d740780d000000005d0000005d0&context=2&backlink=WXOD.aspx%3ffs%3d0442d740780d0000800005c600005c6%26ft%3d1>

limited to domestic refuse and is allowed on the property of private residences where not more than two families are living. The DEP states that the regulation of open burning of household waste is best left in the hands of municipal officials.

Perry County's Municipal Solid Waste Management Ordinance does not mention backyard burning. The Ordinance does state in Section 5, Rules and Regulations, "The County's Rules and Regulations shall, at a minimum, prohibit the dumping of Regulated Municipal Waste, Source Separated Recyclable Materials or any Municipal Waste as defined by Act 101 at any site or location within the County not licensed pursuant to the Ordinance and not holding a permit from the Department".

Illegal Dumping

The County requires MSW haulers to use licensed landfills. There are no landfills located in Perry County. The landfills report the incoming tonnage to the DEP in an annual report. Table 5 below lists the tons of MSW generated in Perry County that were reported by licensed landfills to the DEP for the last four years.

Table 5
Tons of MSW Originating in Perry County¹

2001	2002	2003	2004
13,499	14,309	13,491	13,341

¹ Source: Pennsylvania DEP.

The landfills and other disposal facilities (transfer stations, waste-to-energy facilities, etc.) collect a County surcharge of \$1.00 per ton on incoming waste from Perry County. (As mentioned previously, the surcharge was scheduled to increase to \$4.00 per ton beginning June 1, 2005.) Table 6 lists the disposal facilities, their reported tonnage, and the County's revenue generated from the surcharge in 2004.

Table 6
2004 Reported County Tonnage, County Surcharge Paid, and
Total Revenue Received by
Perry County, PA

Disposal Facility	Report Tonnage ¹	Paid Tonnage	Tonnage Revenue ²
WSI Sandy Run Landfill	360.7	443.7 ³	\$443.70
Alliance Sanitary Landfill	5.2	0	\$0
CES	1,210.6	1,106.98	\$1,106.98
Pine Grove Landfill	0	0	\$0
Comm Refuse Services Landfill	7,261.3	7,219.0	\$7,219.00
LCSWMA Frey Farm Landfill	0	0	\$0
Mifflin Co SWA	1,329.3	1,357.67 ³	\$1,357.67
Modern Landfill	1,128.6	1,128.58	\$1,128.58
Mountain View Reclamation	1,781.4	1,781.46	\$1,781.46
IESI Blue Ridge Landfill	0	4.98	\$4.98
Mostoller Landfill	81.4	0	\$0
Shade Township Waste Management	20.7	0	\$0
Southern Alleghenies Landfill	162.2	0	\$0
Harrisburg WTE	0	726.85	\$726.85
York Co RRC	0	0	\$0
Total	13,341.4	13,769.22	\$13,769.22

¹ Source: Pennsylvania DEP.

² Source: Perry County Conservation District.

³ Includes payment on Construction and Demolition (C&D) tonnage.

Per Table 6, the County received surcharge revenue on approximately 97% of the tonnage reported by the disposal facilities in 2004. The revenue generated from the surcharge is used to fund the County's solid waste management programs.

Based on a population of 43,602, the 2004 tons of MSW originating in Perry County equates to 612 pounds per person per year, or 1.68 lbs/person/day which is well below the national average of 4.45 pounds of MSW per person per day⁵. Using the national average as a benchmark, it appears that the County should be generating approximately two and a half times more MSW than was generated in 2004.

⁵ Source: U.S. Environmental Protection Agency report, "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2003".

One plausible explanation for the low quantities of Perry County MSW reportedly disposed by regional landfills/disposal facilities, may be the high incidences of illegal dumping and open burning in the County.

Recommendations

Recycling

Drop-off Sites/Perry County Metals

A contributing factor to the success of a recycling collection program is convenience. Because each drop-off site is only available to residents of that area or township once per month, residents may get discouraged and choose not to recycle rather than store the materials for a month or drive to a neighboring drop-off collection site. R. W. Beck recommends the County consider the following two options to increase the convenience of recycling:

- **Provide access to drop-off recycling sites 24-hours a day, seven days a week.** At a minimum, have one or two sites in the County open around the clock. This would require servicing the sites at least once per week by not only collecting the roll-off containers, but also cleaning up any items that may be dumped at the site illegally.
- **Extend hours of monthly collection days or have more than one collection event per month, per site.** The County should consider the feasibility and cost of extending the hours or having more than one collection event per month, per site.

Other recommendations to improve the recycling collection program in Perry County include:

- **Request proposals for the hauling of recyclable materials.** The County should draft a request for proposals (RFP) for the same services currently provided by Perry County Metals (i.e., collect the recyclable materials from the drop-off sites and haul the materials to a MRF or to an end-user). This could be considered the “base” price and would allow the County to receive competitive pricing for this service. The County could also ask for alternate proposals for additional service such as servicing the current sites more frequently, hauling the recyclable materials to Dauphin County’s MRF⁶, or hauling specific materials to end users. The current agreement with Perry County Metals can be terminated at the end of any calendar month with notice on or before the 15th of said month.
- **Consider delivering recyclable materials to Dauphin County’s MRF.** The County should contact Dauphin County to inquire about the feasibility of delivering recyclable materials to Dauphin County’s MRF in Harrisburg, once their facility is operational (tentatively scheduled to open in early 2006). If that is an option, inquire about a possible revenue sharing arrangement from the sale of the County’s recyclable materials. The MRF

⁶ Scheduled to be operational in early 2006.

may charge a processing fee per ton of materials delivered. This cost could be negotiated based on the quantities delivered.

- **Research available markets for various commodities.** The County should investigate its options and the feasibility of delivering materials directly to processors and/or end users. Facilities such as Spectrum Recyclers in Highspire and Harrisburg Waste Paper Company in Harrisburg accept many grades of paper for recycling. Both Tri-State Recyclers in Harrisburg and Chambersburg Wastepaper Company in Chambersburg accept metal as well as paper products for recycling.
- **Purchase a roll-off collection vehicle and hire one full-time staff to operate.** The County may want to consider purchasing a roll-off truck to service the recycling sites. (The estimated cost of a new roll-off truck is \$120,000. Annual maintenance costs average \$20,000 per year, per vehicle.) This would require hiring at least one full-time equipment operator to service the recycling sites and transport the materials to a local MRF. It would also be recommended to research vehicle leasing options so that a spare truck could be accessible to ensure the collection of recyclable materials would not be adversely impacted due to scheduled and unscheduled down time of the primary vehicle. Another option would be to negotiate with Perry County Metals or some other hauler for their roll-off services on an as-needed basis when the County's vehicle is down for maintenance or repairs. The County would also want to ensure that more than one County employee is trained to operate the vehicle in order to fill in on vacation or sick days.
- **Consider the Haul-All Collection System.** Perry County may want to research the feasibility of switching to the Haul-All collection system (see Figure 7) in the future. The system differs from the roll-offs in that only one or two material types are collected from each site at a time until the truck reaches its capacity, unlike the current system in which the entire roll-off is removed and all materials are emptied. The implementation of a Haul-All system would require a substantial capital investment of approximately \$7,000 to \$8,000 per collection container, plus approximately \$145,000 for the purchase of a specialized collection vehicle to service the containers. The County could inquire with the DEP about the possibility of applying for an Act 101 Section 902 Recycling Grant to pay for a portion of these costs. Considering the small quantities of recyclable material currently collected in Perry County (see Table 2 of this report), the Haul-All system may not be economically feasible at this time, but should be considered in the future when the quantities of recyclable materials collected in the County increases. One benefit to using the same collection system as a neighboring community is the ability to assist each other when collection vehicles are down for repair or scheduled maintenance. Dauphin County (Perry County's neighbor to the east) and Schuylkill County (Dauphin County's neighbor to the east) both utilize the Haul-All recycling container system.

If the County were to switch to the Haul-All system, it would be worthwhile to inquire with Dauphin County regarding the feasibility of contracting for collection and transportation services. Dauphin County currently does not have the staff or equipment to offer collection and transportation services to Perry County, however if Perry County were to offer to pay

Dauphin County a fee for their collection services and perhaps even pay a portion of the cost for a Haul-All collection vehicle, Dauphin County may be interested.

- **Send newspapers and cardboard to a MRF with baling capacity to share in the revenue received from paper end users.** Usually in any residential recycling program, newspapers make up the largest portion of the materials collected. (Per Table 2 of this report, cardboard makes up the largest portion of recyclable materials collected in Perry County. This could be due to businesses using the drop-off collection sites to divert large amounts of cardboard from their waste stream.) At this time, the County's newspaper is given to local farmers and the cardboard is collected and transported by Perry County Metals to its facility. If these materials were sent to a MRF that is able to produce mill-quality bales, the County could possibly negotiate a revenue sharing agreement for these materials. Also, the County should consider adding office paper/magazines/phone books to its list of acceptable recyclable materials. This type of paper makes up a large portion of the residential waste stream. When sorted and baled, office paper is a valuable commodity.

Table 7 lists market prices for baled material as an example of what some MRFs could possibly be receiving when selling various grades of paper to end users. This does not infer that the County could receive these prices, but rather that Perry County's paper should be treated as a valuable commodity and certain MRFs may be willing to compensate the County a percentage of the revenue received from the sale of paper to end users.

Table 7
Current Market Prices for Recyclable Paper

Commodity ¹	Current Market Prices for Baled Material ²
Newspaper (#8) ³	\$75.00 to \$80.00 per ton
Newspaper (#6) ⁴	\$40 to \$45 per ton
Corrugated cardboard (#11) ⁵	\$70 to \$75 per ton
Sorted office paper (#37) ⁶	\$85.00 to \$95.00 per ton
Mixed paper (#1) ⁷	\$50.00 to \$55.00 per ton

¹ Commodity descriptions are based on the Institute of Scrap Recycling Industries, Inc. (ISRI): <http://www.isri.org/Content/NavigationMenu/CommoditySpecifications/SpecsDocument/specifications.pdf>

² Source: Official Board Markets, July 2, 2005, New York region.

³ Number 8 news consists of sorted newspapers, free from brown paper bags, magazines, and paper other than news, and contains zero prohibitives (any materials which by their presence in excess of the amount allowed will make the paper unusable, or any materials that may be damaging to equipment). The total outthrows (papers that are manufactured, treated, or are in such a form as to be unsuitable for consumption as the grade specified) may not exceed ¼ of 1% per the ISRI specifications, and is the most common grade sold to end-users as it typically garners the most revenue.

⁴ Number 6 news consists of unsorted newspapers containing less than 1% prohibitive materials and the total outthrows may not exceed 5% per the ISRI specifications.

⁵ Number 11 corrugated cardboard consists of corrugated containers containing less than 1% prohibitives and 5% total outthrows.

⁶ Number 37 sorted office paper consists of paper containing primarily white and colored groundwood-free paper, free of unbleached fiber, and containing less than 2% prohibitives and 5% total outthrows.

⁷ Number 1 soft mixed paper consists of a mixture of various qualities of paper not limited as to type of baling or fiber content, and containing less than 2% prohibitives and 10% total outthrows.

- **Require that MSW haulers in the County must offer variable rate pricing for MSW collection service.** One way to increase the quantities of recyclable materials collected from the residents is to implement a volume-based collection system for refuse. (Currently, one hauler in the County, Dynamite Disposal, provides volume-based rates by selling 30-gallon trash bags for \$2.50 and 20-gallon bags for \$2.00 for once per week collection.) This collection system is also referred to as “Pay-As-You-Throw” (PAYT). Offering different levels of service through varying sizes of refuse containers creates a financial incentive for residents to reduce the amount of refuse they set out each week which can result in an increase in the amount of recyclable materials set at the curb. It should be noted that PAYT programs can only be successful where mandatory refuse collection is enforced.

The U.S. Environmental Protection Agency (EPA) “supports this approach to solid waste management because it encompasses three interrelated components that are key to successful community programs:

1. Environmental sustainability – reduces solid waste and increases recycling;
2. Economic sustainability – allows communities to cover their solid waste costs and allows residents to take control of their solid waste bill; and
3. Equity – PAYT systems are more fair. Residents who recycle are not subsidizing those who do not recycle”.⁷

An ordinance revision is recommended that would require haulers to provide variable rates for varying quantities of refuse. Another option would be for the County to consider contracting or franchising for refuse as well as recyclable materials collection and requiring that refuse be collected and billed based on volume.

Volume-based systems typically use plastic bags, stickers or tags, or permanent containers – or a combination - as the unit(s) of measure by which fees are charged for solid waste collection and disposal.

- **Bags** – Bag-based systems require residents to purchase and use special plastic bags in order to discard their household waste. Bags are distributed through local retail outlets or by the public works or solid waste department. Typically, the price set for the bags covers both waste collection and disposal costs.
- **Tags/Stickers** – With this system, a tag or sticker is required to be attached to each bag of waste disposed and can be designated for specific size bags (i.e., 13 gallon, 30 gallon, etc.). Tags and stickers can be distributed and priced the same way that specialized bags are distributed and priced in a bag-based PAYT system. In addition, tags or stickers can be attached to large items that do not fit in bags.
- **Permanent Containers** – In container (or can) PAYT systems, households pay according to the size and number of permanent containers that they use for waste

⁷ Source: U.S. EPA, Pay As You Throw website: <http://www.epa.gov/epaoswer/non-hw/payt/intro.htm>

disposal. In some communities, containers are supplied by the service provider, while in other communities, households supply their own containers in accordance with approved guidelines. In many communities, containers of various sizes are offered on a subscription basis by the service provider, and residents choose what size and number of containers they want to use. To save money, customers must reduce their can size (and/or number of cans) to see any savings.

Volume-based systems are gaining in popularity across the country. According to the Pennsylvania Department of Environmental Protection (DEP) website, there are now 213 PAYT communities in Pennsylvania. Volume-based systems are very effective at reducing solid waste and increasing recycling participation, however, there are also potential barriers/issues that must be addressed to successfully implement this system. These potential barriers/issues include:

- Illegal dumping;
- Ensuring full recovery of expenses;
- Controlling/covering administrative costs;
- Perception of increased cost to residents; and
- Building public consensus.

Stricter enforcement of existing ordinances is required to address illegal dumping. Greater penalties need to be imposed for violations. Cost issues can be resolved with careful planning, a clear understanding of total service cost, and communicating to the public that the program could reduce their cost of service, depending on household size. Including public input early in the process can help to build public consensus and understanding of the real benefits to the residents.

Public Education

R. W. Beck recommends the County consider budgeting for expanded recycling and illegal dumping public education efforts. Detailed information could be distributed to County residents more frequently and in various forms.

Residents need regular reminders about the “hows” and “whys” of the County’s recycling program and the “why nots” of illegal dumping. Marketing studies have reported that a message needs to be seen at least seven times to have any impact, and at least 20 times to change a consumer habit. The County should provide detailed information directly to its residents.

Examples of other methods (besides newspaper ads) that can be used to educate residents include:

- **Brochure** – Although the County already publishes a recycling brochure, the following should be kept in mind: Not only should the brochure explain the County’s recycling program, including what materials are accepted in the program, how to prepare the items for collection, and where and when to recycle, but also explain why it is important to recycle

and the benefits of recycling. (For example, Dynamite Disposal provides volume-based collection service, so residents who subscribe with Dynamite have an incentive to recycle in an attempt to lower their disposal costs.) The brochure could be directly mailed to residents, however the cost of postage can be prohibitive. Other options include hand delivering, perhaps with the help of a local scout group or youth organization. Brochures are most effective when they are printed in more than one color and have pictures or drawings to emphasize the message. Also, in communities with large populations of non-English speaking residents, brochures printed in additional languages help to spread the word about recycling.

- **Newsletter** – The County has plans to develop a recycling newsletter to be distributed to all County residents. Recycling and illegal dumping information should be included in every issue. Article topics should vary and could include general recycling information, as well as proper disposal information for household hazardous waste, problem waste (tires, batteries, appliances, used motor oil, electronics, etc.), and yard waste, as well as the ramifications of illegal dumping.
- **Billboards** – A billboard is an effective way to communicate recycling and illegal dumping messages to residents.
- **Website** – More and more people look for community information on the Internet. It is recommended that more detailed solid waste, recycling, and problem material disposal information be included on the County’s website. Also, illegal dumping information should be prominently posted on the site and include the dollar amount of fines, and instructions for residents to report illegal dumping.
- **Television** – Usually a municipality is able to air public information, such as recycling drop-off locations/schedule and illegal dumping information, on the local public access television channel at no cost. Some municipalities have created videos tailored to their communities programs, which can be an effective way to broadcast information to residents.
- **Promotional Items** – Promotional items such as pens, magnets, calendars, etc. are an inexpensive way to get recycling messages out to residents in a way that has the potential to be seen over and over again.

The development and printing (but not postage) of recycling public education pieces may be eligible for funding under the DEP’s Act 101 Section 902 Recycling Grants.

Provided below are recommendations for improving public education. Some of these options may not be financially feasible for the County, but they are included here for future consideration.

- When designing public education brochures and information pieces, consider using a consistent “look” in all pieces (i.e., use the same font, colors, logo, mascot, etc.). Residents will eventually recognize these as waste reduction and recycling (or illegal dumping) information pieces and will hopefully save them and reference them when needed.

- Increase the public education budget to expand the visibility of the recycling and waste diversion programs. It is recommended that at least \$1.00 per household, per year, be budgeted for public education.
- Hire a dedicated staff person to devote time to recycling. If possible, research grant opportunities to pay for part or all of this person's salary. Also, consider hiring a college intern to help with recycling-related tasks. With a dedicated staff person, the County could develop a plan to educate school children through regular school presentations.

Perry County Metals

The County should require monthly reports/delivery receipts from Perry County Metals to ensure that recyclable materials are truly being recycled and ending up at end markets. The County may not have any say in what the company does on their premises (as far as contamination and using bunkers to keep the materials separate, etc.), but the County should ensure that materials are definitely being sold to end markets and are being recycled.

Burn Barrels

The Professional Recyclers of Pennsylvania (PROP) website provides information and resources concerning the issue of open burning⁸. Open burning may or may not be an issue the County wishes to address at this time, but it does play a role in illegal dumping. Residents who do not subscribe with a hauler for the collection of MSW but choose to burn their MSW need to be made aware of how and where to properly dispose of non-burnable items.

For future reference, the DEP provides a Model Open Burning Ordinance on their website:

<http://www.dep.state.pa.us/dep/deputate/airwaste/aq/openburn/docs/burnord.pdf>.

Illegal Dumping

Because garbage collection is not mandatory in Perry County, it is more difficult to ensure that garbage is being handled in a safe, proper, and legal manner. Mandating that residents subscribe to or contract with a collection company for the removal of municipal solid waste (MSW), may be a daunting task, but would inevitably reduce illegal dumping because most people who are required to pay for a service will be more inclined to use that service.

To address current illegal dumping issues, R. W. Beck has provided the County with guidelines to address illegal dumping in Appendix A, "Six Key Elements to Establishing and Operating an Illegal Dumping Prevention and Response Program".

The guidelines are excerpts from a publication created for the Iowa Department of Natural Resources (DNR) in 2003 by Reed, Stowe & Yanke (now part of R. W. Beck, Inc.) entitled "How to Establish and Operate an Illegal Dumping Prevention and Response Program".

⁸ Link to PROP website: <http://www.proprecycles.org/PROP's%20Open%20Burning%20Information.html>

Sally Tengeres
September 26, 2005
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Although the original document was developed for the Iowa DNR, the findings and recommendations are applicable to all local governments.

Appendix A contains six sections to address the key elements to developing an effective illegal dumping enforcement program:

- Section 1 – Political Buy-In/Planning
- Section 2 – Management Structure
- Section 3 – Education
- Section 4 – Enforcement and Prosecution
- Section 5 – Cleanup
- Section 6 – Program Administration

The County should consider applying for another DEP Technical Assistance grant to address illegal dumping in more depth. Implementing an illegal dumping prevention and response program will be time consuming and without full-time staff to dedicate to the program, the County would benefit from having an outside party assist with the details to ensure that the program will be successful and will have positive, measurable results.

Thank you for the opportunity to assist Perry County. Please contact me at (651) 994-8415 to discuss this report in detail.

Sincerely,

R. W. BECK, INC.



Mary Chamberlain
Project Manager

Appendix A

Six Key Elements to Establishing and Operating an Illegal Dumping Prevention and Response Program

Appendix A

SIX KEY ELEMENTS TO ESTABLISHING AND OPERATING AN ILLEGAL DUMPING PREVENTION AND RESPONSE PROGRAM

This appendix contains excerpts from a publication created for the Iowa Department of Natural Resources (DNR) in 2003 by Reed, Stowe & Yanke (now part of R. W. Beck, Inc.) entitled “How to Establish and Operate an Illegal Dumping Prevention and Response Program”. Although the original document was developed for the Iowa DNR, the findings and recommendations within the guide book are applicable to all local governments in the United States.

The resource guide was structured into six sections to address the six key elements to developing an effective illegal dumping enforcement program. Each of the following six elements *must* be successfully addressed to have an effective program:

- Section 1 – Political Buy-In/Planning
- Section 2 – Management Structure
- Section 3 – Education
- Section 4 – Enforcement and Prosecution
- Section 5 – Cleanup
- Section 6 – Program Administration

Every local government is different; therefore, the above elements should be addressed in a manner that meets the unique needs of each particular community.

Section 1 – Political Buy-In/Planning

In order to develop an effective environmental enforcement program, it is essential that the local politicians (city council members, county commissioners, etc.) and senior level management (city manager, county judge, etc.) within the local government be 100% committed to the program. It is also important that the citizens and the local government’s employees understand that the elected officials and senior management are 100% behind the program.

Support for the program, by the elected officials and senior management, must be shown in the following manner:

- Political support and backing must be provided for the local government staff member(s) who are implementing the program.
- Sufficient monetary funding must be made available for the program.

- Sufficient personnel must be made available in order to effectively implement and operate the program.

Examples of ways in which staff and/or citizen groups can educate their elected officials and senior level management with regard to the need for an environmental enforcement program include:

- Photographs
- Maps
- Press coverage
- Examples of successful programs in other communities
- Tours of illegal dumpsites
- Explanation of cleanup costs, which are typically 2-3 times more than legal disposal
- Explanation of health and safety issues

During the planning stage, five key elements must be addressed:

1. Determine the proper management structure.
2. Determine the process for educating all parties (citizens, police, prosecutors, judges, etc.).
3. Determine how to enforce and pursue criminal and civil legal options.
4. Determine how to cleanup illegal dumpsites.
5. Determine how to best handle on-going program planning and management.

Effective enforcement programs must be coordinated with existing solid waste services and understood as part of a comprehensive program.

Section 2 – Management Structure

One of the key tasks facing local officials once they have decided to establish an environmental enforcement program is the selection of the most effective management structure. “Management structure”¹ is defined as the department within the city or county government responsible for overseeing and managing the environmental enforcement program. Management structures vary widely from city to county to interagency and from civilian to law enforcement control. The most frequently encountered management structures include:

- Code Enforcement and Compliance Department

¹ In describing management structures, the authors have listed the department within the city or county government that is responsible for managing the environmental enforcement program. While an environmental enforcement program will require the provision of numerous services from various departments within the city or county government (health, law enforcement, prosecution, courts, public works, etc.), there is typically one department which is charged with administering, coordinating and managing the program.

- Public Works Department
- Health Department
- Sanitation Department
- Sheriff's Department
- County Board of Supervisors or Commissioners
- County Attorney's Office
- County Conservation Board

Factors influencing the choice of management structure include: type of governmental entity, available solid waste services and providers, level of budgetary support for the program, and ability to create necessary interagency relationships.

New job positions created by illegal dumping programs are environmental enforcement officers and program administrators. Existing job positions that will be impacted or modified by the program include prosecutors, judges, and cleanup crews.

Section 3 – Educational Materials

Education is imperative for any successful environmental enforcement program. It promotes public awareness about illegal dumping, provides information about legal options for disposal and recycling, and encourages public cooperation in identifying illegal dumpsites and prosecuting illegal dumpers. Education also helps build consensus among local decision-makers and judges about the importance and value of such programs. Without education, even good enforcement efforts may fail to achieve the public and political support necessary to stay funded and operational.

Education needs to begin early and continue for the life of the program. Even before environmental enforcement officers are hired, it will be necessary to educate key decision-makers about the need to do so.

A common misconception is that public education has an endpoint. In fact, education should never stop. It functions to tell new residents, new community leaders, and successive classes of school children about the program while reinforcing the message for those who are already familiar with it. Although it is best to begin an education program early and to make use of it often, it is never too late to start.

The value of public education is well known to those who are most familiar with environmental enforcement issues. Numerous state and local governments have identified increasing public awareness as one of the primary approaches needed to solve illegal dumping problems. When Keep America Beautiful convened a nationwide anti-dumping discussion group in 1993, the participants concluded that “the main causes of dumping were lack of convenient legal alternatives, lack of public

awareness of the issue, lack of judicial understanding of environmental laws and, consequently, low fines.”²

What follows is a general guide to developing a public education plan which will support an environmental enforcement program. Local needs and circumstances will affect the scale and scope of the education plan, however, all general topics below should be considered.

- A separate education budget should be considered part of the overall program costs.
- Environmental enforcement officers will function as the key educational personnel. As much as 50% of overall man hours will be spent on education in new programs and 20-25% in established programs. Environmental officers will be able to dedicate the remainder of their time to actual enforcement cases.
- Other educational duties, such as writing press releases, scheduling public appearances, and planning special events may be handled by program administrators or other personnel with the necessary expertise.
- Multiple audiences should be targeted for education, including: elected officials, government staff, law enforcement officers, code enforcement officers and health department officials, prosecutors and judges, the local media, illegal dumpers, local businesses, and the general public. Educational messages should be developed that address the interests and needs of these various audiences.
- Messages should be clear and direct, such as “Stop Trashing Our Precinct” or “Illegal Dumping is a Crime.”
- A variety of methods should be used to get out the message including print and electronic media, and public presentations. Both adults and children should be addressed. Effective programs combine passive forms of education (brochures, fliers, posters) and more active forms (community meetings, booths at special events, presentations to school children).
- Hotlines are one of the most important public outreach tools. They increase public awareness about the program and provide valuable information about illegal dumping activity. Another method that directly involves the public is neighborhood cleanups.

Section 4 – Enforcement and Prosecution

The effective enforcement and prosecution of illegal dumpers under the state’s illegal dumping laws and local ordinances is an essential component in making sure that a community’s environmental enforcement program is a success. If an environmental enforcement program does not have in place an effective process for enforcing the laws and prosecuting the illegal dumpers, the illegal dumpers will not change their behavior and the community will not see a reduction in illegal dumping. These

² *A Public Communication Plan for Decreasing the Municipal Cost to Battle Short Dumping in Philadelphia*, 1995, by Mark Vigiano, executive director, PhilaPride, a Keep America Beautiful affiliate.

findings have been confirmed during conversations with a number of managers for environmental enforcement programs throughout the country.

Enforcement and prosecution issues can directly impact the overall success of a community's environmental enforcement program. To assist local governmental officials in making sure their program is effective, the following issues and recommendations are provided:

- Environmental enforcement officers should be trained in environmental laws and have good communications and investigative skills. Full-time commissioned peace officers are preferred.
- Lack of effective prosecution is often a consequence of prosecutors being unfamiliar with environmental law. Many resources are available to remedy the situation including sample pleadings, environmental law training sessions, and advice from experienced environmental prosecutors.
- Judges are often unaware of the important role courts play in deterring illegal dumping. Prosecutors who are familiar with environmental law may be useful in educating judges.
- Some communities establish environmental courts or designate certain prosecutors as specialists in environmental law to assist in the effective prosecution of illegal dumpers.
- Environmental cases may be tried in both criminal and civil courts.
- Extensive training materials are available including workshops, videos, and publications.
- Effective programs involve active networking with other programs and pertinent professional organizations.

Section 5 – Cleanup

One of the key steps in maintaining a successful environmental enforcement program is making sure that the local government has an effective policy with regard to the cleanup of illegal dumpsites. It is important that the sites be cleaned up in as timely a manner as possible since trash left onsite attracts additional illegal dumping. The cost of cleaning up illegal dumpsites can be very expensive.

Cleanup methods include:

- Community cleanups – volunteers.
- Local government crews conduct cleanups.
- Cleanups mandated by those convicted of illegal dumping.
- Prison labor.

The primary source of funding for cleanups is local government. Some states provide financial assistance for the cleanup of illegal dumpsites. Limited funds are available through dumping fines.

Keeping the Sites Clean

Once the sites are cleaned up it is important that the local government keep these sites free of illegally dumped materials. The “broken window theory” states that property that is not maintained fosters and attracts illegal dumpers, as well as other types of criminal activity.

Obviously, for many of the rural counties it is rather difficult to keep all dumpsites cleaned up because of the “limitless” number of places in the rural county where waste can be dumped illegally. However, there are certain actions that even rural counties can take in an effort to reduce the amount of illegal dumping and to keep chronic dumping sites clean. These actions are as follows:

- Posting of Signs;
- Lighting;
- Barriers;
- Education; and
- Surveillance cameras.

Dealing with Hazardous Waste and Other Dangerous Materials

When dealing with illegal dumping problems, environmental enforcement officers will frequently come into contact with unidentified materials that could be hazardous waste or other dangerous materials. The illegal dumping of hazardous wastes can be a problem because it can be expensive to properly dispose of these materials. Only properly trained professionals should handle or otherwise come into contact with any materials that could potentially pose a threat to their health and safety. Environmental enforcement programs should also coordinate efforts with local fire departments and emergency response units to determine standard procedures for dealing with hazardous materials.

Another related problem that is increasingly affecting communities is the illegal dumping of chemicals or by-products used in making methamphetamines, which are synthetic amphetamines or stimulants that are produced and sold illegally. It is essential to use properly trained personnel when dealing with these types of cleanups because of the following issues:

- Making methamphetamines requires the use of poisonous, unstable, extremely flammable ingredients.
- Vapors that escape during the cooking process can be fatal.
- Five or six pounds of toxic waste are created for every pound of methamphetamine cooked.

Hazardous waste and emergency response training is imperative to ensure the safety of individuals who might be responding to illegally dumped hazardous materials. Sheriffs, deputies, or emergency management staff can attend training seminars at various community colleges, regional training facilities, or can apply for grants to bring emergency management training to the county.

Section 6 – Program Administration

Once the environmental enforcement program is operational, there are four primary areas of responsibility that the manager of the environmental enforcement program (manager) will need to address on an on-going basis, in order to ensure the program remains a continued success. These four areas of responsibility must be addressed on an on-going basis.

1. **Completion of general administrative duties and tasks.** Administrative duties include oversight of the education program, the citizen call-in system, integration with other solid waste management programs, and general operational procedures. The administrator is also the liaison between the department and other agencies.
2. **Management of financial resources.** Financial duties include preparation of the annual budget, tracking of actual versus budgeted expenses, and identifying available funding sources such as ad valorem taxes, solid waste user fees, landfill tipping fees, etc.
3. **Monitoring of key operating activities.** Managers should develop and maintain a database of “key activities” which can be used to measure the effectiveness of the program. Such data should include the number of complaints received, number of warnings issued, number of citations issued, number of cases prosecuted, number of dumpsites cleaned up, and cubic yards or tons removed through cleanup enforcement. Dumpsites should also be mapped.
4. **Review of overall program effectiveness.** On either a semi-annual or annual basis the manager should review the environmental enforcement program to determine whether the program is meeting its stated objective: the reduction of illegal dumping within the community.