



May 17, 2004

Ms. Kelly Wolf
Recycling Coordinator
Dauphin County Administration Building
2 South Second Street
Harrisburg, PA 17101

Subject: Improving and Expanding the Central Dauphin School District Recycling Program

Dear Kelly:

Dauphin County has requested assistance with assessing the Central Dauphin School District's recycling program. This is an important goal for the County as this is the County's largest school district, with 16 of 18 facilities located in municipalities that are mandated to recycle under Act 101, the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988. This letter report serves to provide Dauphin County/Central Dauphin School District with recommendations for improving the physical program, as well as for educating students, staff, and faculty about the program and the importance of recycling. Specifically, this report will include:

- An evaluation of the current program, including information gathered from the district's facilities;
- The results of a waste review in a sampling facilities to determine the composition of waste/recyclables as a means of estimating potential materials that could be recovered, or if the data is inadequate, use of data from another school district to develop estimates of potential materials that could be recovered;
- An assessment of educational needs, with input for the development of a district-wide recycling education program; and,
- Recommendations to improve and expand the program with an eye toward more consistent implementation throughout the district's facilities.

CENTRAL DAUPHIN SCHOOL DISTRICT'S CURRENT PROGRAM

Under the Municipal Waste Planning, Recycling, and Waste Reduction Act of 1988 (Act 101), institutions located within municipalities that are mandated to recycle are required to recycle high grade office paper, corrugated cardboard, aluminum cans, and yard waste, plus any other materials required of them by the municipalities where the facilities are located. All schools in Central Dauphin School District, with the exceptions of Middle Paxton Elementary and West Hanover Elementary, are located in mandated municipalities. With the exception of a program recently implemented at Central Dauphin High School, the Central Dauphin School District's recycling program is limited to recycling corrugated cardboard (OCC) in the two high schools, three junior high schools, and the Administration Building. Each of the schools has one eight cubic yard container for OCC that is collected once per week. Most of the OCC comes from the cafeterias and maintenance, and all boxes are flattened before being placed in the containers. The head custodians for each facility report that these containers are nearly always full when they are picked up, and are sometimes overflowing. Cardboard generated in the Administration Building is baled using a baler located in the building, and only about two to three bales are generated per year from this location. The custodians at the elementary schools report that while OCC is flattened prior to disposal, the OCC makes up a significant portion of the waste disposed.

According to Clarence "Butch" Fidler, Director of Buildings and Grounds, and custodial staff contacted at approximately half of the schools, aluminum cans generated by teachers in teacher lounge areas are being recycled either by teachers or custodial staff who contribute them to support local organizations. The district has no record of the number of cans recycled.

The District recently began recycling office paper in the offices and classrooms at Central Dauphin High School as a result of efforts by a student working on a Girl Scout project. Each classroom has a recycling box supplied by the PA Department of Environmental Protection, and these boxes are also placed throughout office areas where they are needed. The High School Key Club collects paper from the classrooms and delivers it to be stored in Toter containers supplied by Spectrum Recycling. Spectrum picks up and markets the paper at no cost to the District. This effort is to be expanded throughout the entire District.

No formal effort has been made to provide education about the program to staff or students. During a visit to the high school, it was noted that there are no labels on containers in either the classrooms or office areas. The principal reported that while a letter had been distributed to announce the start of the paper collection program, there were no instructions concerning what is and is not acceptable.

Until a few years ago, the District had a program that collected OCC, office paper and steel cans from the cafeterias. Several custodial staff reported that this effort ended when the District contracted with Servicemaster to manage some of the custodial work because Servicemaster claimed that it was too costly to manage recycling collection.

FACILITIES REVIEWED/WASTE ASSESSMENT

Because of the large number of facilities, not all facilities were visited. Below is a brief description of findings at the facilities visited.

GENERAL

As noted above, the three junior high schools and the two high schools each have an eight cubic yard container for OCC. These facilities also have vending machines for the sale of Coca Cola products in 20 ounce bottles. There are no figures for the number of #1 PET plastic bottles generated from these machines because they are managed by Coca Cola, not the district, though the custodians report that the bottles make up a significant portion of the waste stream generated by each of the schools by volume. The elementary schools do not have OCC collection containers or vending machines with plastic bottles.

Custodians in all but one facility reported that staffing had been reduced in recent years, and that they did not have sufficient staff available to facilitate recycling collection.

CENTRAL DAUPHIN HIGH SCHOOL (1,798 students)

Central Dauphin High School has two eight cubic yard containers for waste that are collected six times per week. These containers are typically full at each collection. The cafeteria generates approximately 13 #10 cans per day. The school has a dishwasher but uses disposable trays in the cafeteria on some days.

CENTRAL DAUPHIN EAST HIGH SCHOOL (1,466 students)

Central Dauphin East High School has two eight cubic yard containers for waste that are collected six times per week. These containers are typically full at each collection. The cafeteria generates approximately 20 #10 cans per day, approximately five one-gallon plastic jugs per week, and 400-500 pint size #2 plastic bottles per day. The school has a dishwasher and uses washable trays in the cafeteria.

CENTRAL DAUPHIN EAST JUNIOR HIGH SCHOOL (823 students)

Central Dauphin East Junior High School has one six cubic yard container for waste that is collected five times per week. This container is typically full at each collection. The cafeteria generates approximately 4 #10 cans per day, 8-10 one-gallon plastic jugs per week, and 8-10 cases (192-240) plastic water bottles per day. The school has no dishwasher and uses only disposable trays in the cafeteria.

LINGLESTOWN JUNIOR HIGH SCHOOL (681 students)

Linglestown Junior High School has one eight cubic yard container for waste that is collected three times per week. This container is typically full at each collection. The cafeteria was unable to estimate the number of cans and plastic jugs generated. The school has a dishwasher

and uses washable trays in the cafeteria on most days, but estimates that it uses disposable trays approximately one day per month.

SWATARA JUNIOR HIGH SCHOOL (557 students)

Swatara Junior High School has one six cubic yard container for waste that is collected five times per week. This container is typically full at each collection. The cafeteria generates approximately two #10 cans per day, and approximately 250-pint size #2 plastic bottles per day. The school has a dishwasher and uses washable trays in the cafeteria.

LINGLESTOWN ELEMENTARY (445 students)

Linglestown Elementary School has one six cubic yard container for waste that is collected three times per week. This container is typically overflowing at each collection—the head custodian reports that the container is not big enough for the school. The cafeteria supervisor was not available during the visit, so no data are available on materials generated in the cafeteria. The school has a dishwasher and the custodian reported that trays are washed.

MIDDLE PAXTON ELEMENTARY (353 students)

Middle Paxton Elementary School has two six cubic yard containers for waste that are collected two times per week. These containers are typically full at each collection. The cafeteria generates 4-6 #10 cans per day, approximately five one-gallon plastic jugs per week, and approximately 24 plastic water bottles per day. The school reports that it has one vending machine, but no count on the bottles generated from this machine. The school has a dishwasher but has no one to manage it, so the school uses all disposable trays in the cafeteria.

PAXTONIA ELEMENTARY (745 students)

Paxtonia Elementary School has one eight cubic yard container for waste that is collected three times per week. This container is typically full at each collection. The cafeteria generates approximately 12 #10 cans per day, approximately three one-gallon plastic jugs per day, and approximately 25 plastic water bottles per day. The school has a dishwasher and uses washable trays in the cafeteria on most days, but estimates that it uses disposable trays approximately one day per week.

PHILLIPS ELEMENTARY (387 students)

Phillips Elementary School has one six cubic yard container for waste that is collected six times per week. This container is typically full at each collection. The cafeteria generates 5-7 #10 cans per day, approximately one one-gallon plastic jug per day, and 8-12 plastic water bottles per day. The school has no room for a dishwasher and uses all disposable materials in the cafeteria.

SOUTHSIDE ELEMENTARY (722 students)

South Side Elementary School has one eight cubic yard container for waste that is collected five times per week. This container is typically full at each collection. The custodian seemed reluctant to talk, and the cafeteria supervisor was unable to talk because lunch was being served.

TRI-COMMUNITY ELEMENTARY (478 students)

Tri-Community Elementary School has one eight cubic yard container for waste that is collected five times per week. This container is typically full at each collection. The cafeteria generates 8-10 #10 cans per day, approximately four one-gallon plastic jugs per month, and approximately 15 plastic water bottles per day. The school has a dishwasher and uses washable trays in the cafeteria on most days, but estimates that it uses disposable trays approximately one day per week.

SUMMARY

Waste composition varies significantly from school to school because schools use disposable cafeteria items in varying degrees, ranging from all disposables to virtually no disposables. Custodial staff seemed to have difficulty estimating the approximate percentage of each type of material disposed. There is no specific data on the tonnage of OCC from the high schools and junior high schools. Because of the variations in what is generated from school to school, it is not possible to estimate the amount of potentially recyclable material available in the district based on the school visits. Estimates will be generated using recycling data from another school

district; however, the district should consider doing a more comprehensive waste assessment that will make it possible for the district to better manage its waste stream.

ESTIMATED RECYCLABLES AVAILABLE IN CENTRAL DAUPHIN SCHOOL DISTRICT

It is necessary to estimate the weight and volume of material expected to be collected in Central Dauphin School District in order to plan appropriately. Because the District does not have specific data on the amount of materials generated, data from Simcoe County Board of Education (provided by VQuip USA, the company that supplies the equipment used by this district) is used for estimating purposes, along with experience to date with cardboard recycling in the junior and senior high schools.

Table 1 estimates the tonnage of corrugated cardboard (OCC) and office paper generated based solely on data from Simcoe County.

Table 1
 Estimated Tonnages of Fiber by School

School Name	# of Students (1)	OCC (2)	Office Paper (3)
Chambers Hill Elementary	244	0.61	1.00
CD East Junior High	823	2.04	3.38
CD East Senior High	1,466	3.64	6.02
CD High School	1,798	4.46	7.38
Lawnton Elementary	314	0.78	1.29
Linglestown Junior High	681	1.69	2.80
Linglestown Elementary	445	1.10	1.83
Middle Paxton Elementary	353	0.88	1.45
Mountain View Elementary	418	1.04	1.72
Northside Elementary	540	1.34	2.22
Paxtang Elementary	271	0.67	1.11
Paxtonia Elementary	745	1.85	3.06
Phillips Elementary	387	0.96	1.59
Rutherford Elementary	403	1.00	1.65
Southside Elementary	722	1.79	2.96
Swatara Junior High	557	1.38	2.29
Tri-Community Elementary	478	1.19	1.96
West Hanover Elementary	394	0.98	1.62
Totals	11,039	27.38	45.32

(1) 2003-2004 data provided by District

(2) Generation estimated at 4.96 lbs./student/year based on two year data (1995-96/1996-97) from Simcoe County Board of Education.

(3) Generation estimated at 8.21 lbs./student/year based on two year data (1995-96/1996-97) from Simcoe County Board of Education.

Table 2 converts the estimated tonnages from Table 1 to estimated volume.

The numbers for OCC appear to be significantly too low based on experience to date. The schools that have OCC collection each report that most of the time, they fill one eight cubic yard container each week during the school year. Some report that the dumpsters are overflowing, and others that they are reasonably full. Assuming 39 weeks for the school year, volume reported for each of these schools is approximately 312 cubic yards per year. Because the schools all report that OCC is flattened, it is assumed that the weight/volume ratio is at approximately 90-lbs./cubic yard. Assuming a total of 1,560 cubic yards for the five schools (312 per school), the estimated total tonnage would be 70.2 tons. When divided by the total students in the five schools, it is estimated that generation of OCC is approximately 26.37 lbs. per student annually.

Table 3 provides a revised estimate of OCC generation for the district. Because there are no comparable data to date concerning office paper generation, generation rate estimates for office paper based on Simcoe County data are used. Therefore, it is estimated that the Central Dauphin

School District generates approximately 145.53 tons (3,234 cubic yards) of OCC annually, and 45.32 tons (226.58 cubic yards) of office paper annually.

Table 2
 Estimated Volume of Fiber by School

School Name	OCC Tons	OCC Volume (1)	Office Paper	Office Paper Volume (2)
Chambers Hill Elementary	0.61	13.45	1.00	5.01
CD East Junior High*	2.04	45.36	3.38	16.89
CD East Senior High*	3.64	80.79	6.02	30.09
CD High School*	4.46	99.09	7.38	36.90
Lawnton Elementary	0.78	17.30	1.29	6.44
Linglestown Junior High*	1.69	37.53	2.80	13.98
Linglestown Elementary	1.10	24.52	1.83	9.13
Middle Paxton Elementary	0.88	19.45	1.45	7.25
Mountain View Elementary	1.04	23.04	1.72	8.58
Northside Elementary	1.34	29.76	2.22	11.08
Paxtang Elementary	0.67	14.94	1.11	5.56
Paxtonia Elementary	1.85	41.06	3.06	15.29
Phillips Elementary	0.96	21.33	1.59	7.94
Rutherford Elementary	1.00	22.21	1.65	8.27
Southside Elementary	1.79	39.79	2.96	14.82
Swatara Junior High*	1.38	30.70	2.29	11.43
Tri-Community Elementary	1.19	26.34	1.96	9.81
West Hanover Elementary	0.98	21.71	1.62	8.09
Totals	27.38	608.37	45.32	226.58

(1) Estimated using 90 lbs./cubic yard based on data provided by VQuip, Inc.

(2) Estimated using 400 lbs./cubic yard based on data provided by VQuip, Inc.

*Schools where OCC is currently collected

Table 3
 Revised Estimate of OCC Volume/Tonnage by School

School Name	# of Students	OCC Volume (1)	OCC Tons (2)
Chambers Hill Elementary	244	71.48	3.22
CD East Junior High*	823	312.00	10.85
CD East Senior High*	1,466	312.00	19.33
CD High School*	1,798	312.00	23.70
Lawnton Elementary	314	91.99	4.14
Linglestown Junior High*	681	312.00	8.98
Linglestown Elementary	445	130.37	5.87
Middle Paxton Elementary	353	103.41	4.65
Mountain View Elementary	418	122.46	5.51
Northside Elementary	540	158.20	7.12
Paxtang Elementary	271	79.39	3.57
Paxtonia Elementary	745	218.25	9.82
Phillips Elementary	387	113.37	5.10
Rutherford Elementary	403	118.06	5.31
Southside Elementary	722	211.52	9.52
Swatara Junior High*	557	312.00	7.34
Tri-Community Elementary	478	140.03	6.30
West Hanover Elementary	394	115.43	5.19

Totals	11,039	3,233.96	145.53
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- (1) Estimated using 90 lbs./cubic yard based on data provided by VQuip, Inc.
- (2) Estimated using 26.37 lbs. per student based on volume data from junior and senior high schools (averaged over the five schools that are collecting OCC)

Estimating the amount of other materials is significantly more problematic. Each school visited was asked to estimate the number of steel cans and plastic generated in the kitchen. The amounts cited were small, and probably do not warrant establishing a separate collection system, particularly since recycling of these particular materials is not mandatory.

Plastic PET bottles (20 oz. containers from vending machines at the junior and senior high schools) contribute significantly more to the volume of material that is being disposed from the district. Without data on the number of bottles generated (which needs to be obtained from Coca Cola, the district's vendor), it is impossible to determine weight or volume that could potentially be recycled—as well as potential savings. The other material that is generated in significant volume is disposable cafeteria trays. While some schools use washable, reusable trays, some rely solely on disposable trays, and even those that have dishwashers and use reusable trays use disposables on occasion—some as often as once or twice a week. Custodial staffs report that these trays make up a significant portion of their waste stream, but it is impossible to estimate volume because of the lack of information and the variability of use among the schools. Options for managing these materials will be discussed later in this report.

ESTIMATED SAVINGS TO CENTRAL DAUPHIN SCHOOL DISTRICT FOR FIBER RECYCLING

Using the generation figures estimated in the previous section, Table 4 estimates annual disposal savings for the district. It is estimated that the district could save over \$4,000 in disposal costs annually based on materials that are currently being disposed—OCC in the elementary schools and office paper in all facilities.

The concern is that because of how the recycling portion of the district's contract is currently structured, the district could potentially pay more for managing its waste. The district is paying approximately \$2.14 per cubic yard for disposal based on total dumpsters and pickups. The rate paid for recycling OCC is \$75 per month per facility for weekly collection. Assuming weekly pickup of OCC at eight cubic yards per week, or 32 cubic yards per month, the rate is approximately \$2.34 per cubic yard for OCC collection. This rate seems to be too high given that the material collected is clean and can be readily marketed, especially when compared to the cost for collection and disposal of waste at \$2.14 per cubic yard. If the district were to add OCC dumpsters at each facility at a cost of \$75 per month, regardless of generation, the cost per cubic yard would be much higher, as demonstrated in Table 5. A total cost of \$750 for OCC collection per facility (monthly collection during school year plus one collection during the summer) is used to estimate the cost per cubic yard for each facility. The average cost per cubic yard for all these facilities, as indicated under Totals, is \$5.82.

Presumably the district could establish a collection system that would prevent the district from paying more for recycling than for waste collection and disposal by renegotiating its contract with Waste Management. First, the district should negotiate a rate where the cost per cubic yard for managing OCC that is recycled is less than the cost to manage wastes that are disposed. Smaller schools that generate OCC at a much lower rate could be collected only once or twice per month rather than weekly, or on an as needed basis. Recycling should not force the district to pay more in waste management costs than disposing all materials.

The district should also consult with Spectrum Recycling or others to determine options for managing OCC. Spectrum has offered to accept fiber from the district at no cost. The current arrangement started at the high school only includes office paper—Spectrum is providing Toter containers and picks up the paper for processing. This service is to be offered to all schools in the district. Assuming this happens, the district could experience a savings in disposal costs of approximately \$480 (based on volume estimated in Table 2. If the district is able to negotiate with Spectrum to manage its cardboard, the estimated savings would be significantly greater—approximately \$3,500 (the total in Table 4 minus the savings estimated above for office paper) plus the \$75 per month the district is currently paying Waste Management for OCC collection.

Assuming \$750 per school for the five schools (this assumes limited collection during the summer), the savings would be \$3,750. The total savings for OCC recycling, using these assumptions, would be over \$7,000 annually.

Table 4
 Estimated Savings for Waste Disposal by School

School Name	OCC Volume (1)	Office Paper Volume (2)	Total Volume	Estimated Savings (3)
Chambers Hill Elementary	71.48	5.01	76.49	\$163.69
CD East Junior High*	312.00	16.89	328.89	\$36.15
CD East Senior High*	312.00	30.09	342.09	\$64.39
CD High School*	312.00	36.90	348.90	\$78.97
Lawnton Elementary	91.99	6.44	98.43	\$210.65
Linglestown Junior High*	312.00	13.98	325.98	\$29.91
Linglestown Elementary	130.37	9.13	139.50	\$298.53
Middle Paxton Elementary	103.41	7.25	110.66	\$236.81
Mountain View Elementary	122.46	8.58	131.04	\$280.42
Northside Elementary	158.20	11.08	169.28	\$362.26
Paxtang Elementary	79.39	5.56	84.95	\$181.80
Paxtonia Elementary	218.25	15.29	233.54	\$499.79
Phillips Elementary	113.37	7.94	121.32	\$259.62
Rutherford Elementary	118.06	8.27	126.33	\$270.35
Southside Elementary	211.52	14.82	226.33	\$484.36
Swatara Junior High*	312.00	11.43	323.43	\$24.47
Tri-Community Elementary	140.03	9.81	149.84	\$320.67
West Hanover Elementary	115.43	8.09	123.51	\$264.32
Totals	3,233.96	226.58	3,460.54	\$4,067.15

(1) Estimated using 90 lbs./cubic yard based on data provided by VQuip, Inc.

(2) Estimated using 400 lbs./cubic yard based on data provided by VQuip, Inc.

(3) Estimated at a savings of \$2.14/cubic yard based on current contract with Waste Management

*Estimated savings for diversion of office paper only since OCC is already being recycled

Table 5
 Estimated Cost for OCC Collection by School Based on Current System (1)

School Name	OCC Volume (2)	Estimated Cost/Cubic Yard (3)
Chambers Hill Elementary	71.48	\$10.49
Lawnton Elementary	91.99	\$8.15
Linglestown Elementary	130.37	\$5.75
Middle Paxton Elementary	103.41	\$7.25
Mountain View Elementary	122.46	\$6.12
Northside Elementary	158.20	\$4.74
Paxtang Elementary	79.39	\$9.45
Paxtonia Elementary	218.25	\$3.44
Phillips Elementary	113.37	\$6.62
Rutherford Elementary	118.06	\$6.35
Southside Elementary	211.52	\$3.55
Tri-Community Elementary	140.03	\$5.36
West Hanover Elementary	115.43	\$6.50
Totals	1,673.96	\$5.82

(1) Only schools not currently recycling OCC

(2) Estimated volumes from Table 3

(3) Based on \$750 annually for collection (\$75/month during school year plus \$75 for the summer for reduced collections)

OPTIONS FOR MANAGING FIBERS

Because nearly all of the custodial staff at the facilities visited expressed concern over the adequacy of staffing to manage a reinstated recycling program, the district will need to consider options for moving materials from classroom and offices to storage containers.

It should be noted here that whether or not the district recycles the materials at all is not an issue. Recycling of these materials is mandated by the state because all of the facilities are located in municipalities where recycling is mandatory. The issue is establishing a system that keeps the district's costs at a reasonable level.

OCC

It appears that OCC is moving efficiently from generation points to the recycling collection containers in the facilities where recycling is taking place. Because most of the material is generated in the cafeterias and in receiving areas, and because most of the material is already being flattened to save space even when it is not being recycled, it does not appear that there is further need to address this issue at individual facilities. The concern addressed here relates to moving the material from individual facilities to a processing facility.

It is not certain that Spectrum could provide collection at this time, but based on the potential for savings, it is almost certainly worth exploring the cost to allocate district personnel time to collect and bale OCC given the cost to use the district's current Waste Management services. The district already has a baler in the Administration building that could be used, and could estimate the cost to manage the material by determining the amount of time expected to be required for this activity and the cost to operate a truck that picks up the material as needed. Alternatively, the district could opt to keep the arrangement with Waste Management for the larger facilities (after negotiating a more reasonable rate than at present) and look to collecting and baling OCC from the smaller facilities. If the district collects, bales and delivers the paper to Spectrum, it would be paid a rate per ton based on the market rate for OCC. The revenue would provide an offset for any costs incurred by the district.

OFFICE PAPER

Spectrum Recyclers has offered to provide its services at no charge to the district for the collection of office paper. The district will receive recycling containers for all classrooms and office spaces from the state at no cost, and 96-gallon Toter containers from Spectrum for storage. Spectrum will also accept gaylord boxes with office paper, but it appears unlikely that any of the schools will use these boxes because they must be kept inside and none of the schools visited had space available for inside storage.

The greatest challenges for the district include:

- Contamination—keeping unwanted materials out of both classroom/office containers and Toters; and
- Moving materials from classroom/office containers to Toters.

Spectrum will accept a mix of paper that can include essentially everything except for carbon paper, tissues, and food contaminated papers. However, the district may be able to receive revenue for a cleaner mix that does not include ream wrappers from copy paper, newsprint, and magazines. Keeping these materials separate should not be particularly burdensome because students are not typically generating these materials in the classroom. These materials can be recycled, however, so it is recommended that they be placed in a separate container located conveniently within office areas where these materials are being generated. Also, containers should be placed at every copy machine or any other location where office paper generation is heavy.

Classroom and office containers may be emptied using custodial staff as they are emptying waste containers. The amount of material to be managed remains the same. Carts could be fitted with separate containers for wastes to be disposed and for office paper, or a separate run could be made to collect office paper after wastes are collected and disposed. It is unclear whether or not this would/could actually happen. The minimal level of staffing available may mean that most—maybe all—schools will need to seek other means for moving the materials to a central storage area.

One suggestion is for service organizations or other campus groups to commit to moving the paper from classroom/office containers to the Toter containers, similar to what the Key Club is doing at Central Dauphin High School. The difficulty in using such groups on a volunteer basis is that unless there is some incentive—usually financial—for them to continue, they may not be reliable over the long run. Another option is to ask teachers to take responsibility for moving the paper from their classrooms to the Toters, though some teachers may object to this additional responsibility. They could, however, work with students, assigning willing students to move the paper from the classroom to a central collection point. A couple of custodians reported that this was done, at least to some extent, in the past. This may not work with the youngest/smallest students, however, given the size of the containers, particularly if they are reasonably full. Finally, the district may want to investigate the potential for using persons assigned to perform community service or on work release as free or low cost alternatives.

It should be noted that placement of the Toters being used for storage of paper is a factor with regard to contamination. Upon examination, it was discovered that there was contamination (aluminum cans and candy wrappers) in the Toters being used at the high school. These containers were located outside and in back of the high school and were not clearly marked. This kind of placement may invite contamination because there is nothing to distinguish the Toters from waste receptacles. In order to avoid contamination, the Toters would need to be kept in an area that can only be accessed by persons who are responsible for managing recyclables and waste who will use them properly, or they must be locked so that persons just passing by cannot use them for waste. In either case, these containers should be clearly marked so that it is clear that they are to be used only for office paper.

OPTIONS FOR MANAGING OTHER MATERIALS

It is worth exploring the possibility of collecting the other materials generated at the schools as part of other ongoing activities in the district. For example, district personnel could collect these materials as they make deliveries to each facility. The collected materials could be held in gaylord boxes or dumpsters until a load is available for pickup or delivery to a processing facility, or the district could deliver cans and plastic containers directly to one of the Dauphin County collection sites. The key is to incorporate collection into an existing routine so as not to add cost for the district.

After discussion with custodial staff at several schools, it should be noted that collection and recycling of PET soft drink bottles sold in vending machines will present a challenge. Staff reported that a significant portion of the bottles disposed still contain product. In some cases, the bottles are nearly full. If the bottles are to be recycled, they would need to be emptied, and the schools cannot be expected to provide staff to manage this activity. There is no easy answer for how this might be done. One possible solution is to provide a place where students can empty the bottles prior to placing them in recycling containers, or students could be encouraged to recap unfinished beverages to be finished later or empty them in lavatory sinks. Many bottles would probably still be disposed, and some may be placed in recycling bins without being emptied, but this would provide an option for responsible students who wish to recycle. Another option might be for a student organization to assume responsibility for emptying bottles. However, some consideration might be given to working with persons assigned to community service or work release—if they were to be used for moving paper, as suggested above. Bottles, including those with product, could be taken to the Administration building and baled—compacting the bottles would release most of the liquids—but this would also present health risks, and would create contamination for the recycling of OCC. In all scenarios, storage at each facility is a concern, both for lack of space and for health concerns (attraction of flies, vermin, etc.). It would be best if empty containers could be moved to a central storage area, away from student areas, until a sufficient number has been accumulated for baling. The first option—having students empty their own bottles—would result in collection of fewer bottles, but may be the best option for the district, unless arrangements can be made to empty the bottles using other means. The district should consider working with Coca Cola to determine if there is assistance—either equipment or financial—that could be provided to implement PET container recycling in the schools.

The district should also consider establishing a program for the recycling of disposable foam trays. Dart Container will lease densifiers that can be used to compact polystyrene products that

would then be picked up for processing by Dart. The cost to lease the densifier is \$295 per month, and costs for bags and pickups would be determined by the amount of material generated. The district could potentially experience savings if it is generating more than 140-150 cubic yards of disposable trays in a given month—depending on the cost to move materials to a central location for densification and storage. The district is currently paying for disposal of 27,352 cubic yards of waste (all types) annually from the schools (this does not include Administration, Landis Field, or Transportation), for an average of nearly 2,280 cubic yards per month. While the schools were unable to estimate the percentage of waste that is disposable trays, based on conversations with custodial staff it is believed that these trays make up more than 6.5 to 7 percent of the waste stream in a given month (150 cubic yards is just over 6 percent of 2,280 cubic yards). The district could benefit from a study that measures the volume of disposable trays generated at all schools in a given month to determine whether or not collection and recycling of these trays would save the district money. It certainly will reduce the volume of waste by some amount. Alternatively, the district should also explore the elimination of the use of these trays altogether, though this may be impossible unless schools that do not have a dishwasher are able to install one.

Trays would need to be emptied of food, though food residues are acceptable. The material would need to be transported to a central site where the densifier is located, and the district would also need to establish a storage area where the material could be held for pick up by Dart. Attachment 1 is a brochure that discusses Dart's foam recycling program. The district should explore the recycling of these trays with a representative from Dart Container.

The district should also keep in mind that bulky items, such as old desks, file cabinets, machinery, etc., need to be replaced from time to time, and that there are markets that can manage, and often pay for, many of these items as well. A discussion on markets may be found in the next section.

RECYCLING MARKETS FOR MATERIALS GENERATED WITHIN THE CENTRAL DAUPHIN SCHOOL DISTRICT

Several potential markets have been noted throughout the sections above for cardboard, paper, and polystyrene. The best markets may best be determined by the needs of the school district. If convenience is the goal, the district may prefer to engage the services of an entity that provides collection, processing, and marketing for the materials that are being recycled—a kind of “one stop shopping” approach. While this is probably the easiest for the district, it is probably also the most costly method. If the district wishes to maximize any potential revenues, it may require that the district be prepared to collect and deliver materials to a market that will pay them at the going market rate, or under the terms of a contract between the district and that market.

For the reasons stated above, it would be difficult to make any specific recommendations concerning the best markets for the materials generated. The district will need to decide what will be most cost effective and efficient, given the resources that are available. There are a variety of markets located throughout south central Pennsylvania that offer a variety of options for recycling, and it would be most beneficial for the district to contact these markets directly to determine what services are available, how materials must be prepared, and whether or not that market will pay for the materials before making any decisions on the best markets for the district. The Department of Environmental Protection maintains a list of facilities on its website at www.state.pa.us/wm_apps/recyclingmarkets. This list is sortable by material type and county. Also, the district may wish to work with the county in obtaining assistance if the county has established relationships with specific markets that would enable the district to obtain a better deal on services and market price.

EDUCATING STUDENTS, STAFF, AND FACULTY

Education needs to take place on two levels. One is providing general education about recycling and solid waste issues. The other is to educate students, staff and faculty about how the program works in each of the district's facilities. This section will touch only briefly on the first level, and then will focus on the second level.

GENERAL RECYCLING/SOLID WASTE EDUCATION

Educating students in grades K-12 lays the groundwork for a strong recycling/waste reduction ethic both now and for the future. Students are often the strongest advocates of recycling, and having a firm understanding of recycling and the issues related to it will provide incentive for students to participate not only at school, but also in their homes and community. The DEP has recycling curriculum materials available, and the County could work with the district to see that some type of recycling educational curriculum is implemented. A student curriculum should contain a strong segment on waste reduction as well as recycling.

The County can also assist by providing ongoing programs within the schools through the use of its new mascot, Billy the Bottle Nose Dolphin, and through the “Illusion Maker” programs that it has been using throughout the school district. These programs provide a fun way to draw attention to the importance of recycling.

EDUCATING STUDENTS, STAFF AND FACULTY ABOUT THE EXISTING PROGRAM

Students, staff and faculty need to have a thorough understanding of how the district’s recycling program works in order for the program to be successful. They can also play a role in assisting the district with aspects of the program if they understand the program.

Ideally, a comprehensive recycling education program should include:

- Written and printed materials to be provided in the classroom;
- Recycling displays placed in prominent places;
- Assemblies to describe and promote the program;
- A clear, consistent, and recognizable logo or other symbol of the program, as well as a slogan;
- Student field education (if possible) to visit a recycling facility, a user of recycled materials, a disposal facility, or other facilities that help students to understand what recycling really means;
- Ongoing reminders about the importance of recycling and how the program works;
- Clear signage and instructions at campus recycling points;
- Opportunities for students, staff and faculty to participate in program planning, operation, and evaluation (probably at the higher grade levels only for students);
- Recognition for recycling excellence.

Spectrum Recyclers has offered to provide educational assistance to the district to support the program they offer. The district should consult with Spectrum to determine specifically what Spectrum can do to assist the district in its recycling education efforts.

Written and Other Printed Materials – Students should receive some type of brochure or flyer at the beginning of each semester that describes the program, explains why it is important, instructs students about the materials to be collected, how they are to be prepared, and where they are to be placed. It should include a message concerning the importance of recycling and encouragement for students to participate from the district superintendent and/or the principal for the specific school.

This material will need to vary by grade level. Younger grades should receive simple materials with a lot of graphic descriptions and a focus on the “hows” of the program, while materials aimed at the older students can include more written information, including more focus on the “whys” of recycling. In either case, recycling education materials should be designed to stand out from other handouts given to students at the beginning of the semester. In addition, students should be encouraged to share the material with their parents.

Another aid to students should be posters displayed prominently in every classroom with graphic depictions of how students are to recycle. These posters could be designed by students, or could use actual photographs of students who are recycling specific materials to show how they are to be prepared and where they are to be placed. In either case, they should be very simple so that the same poster could apply throughout the district for all grade levels.

Recycling Display – Each facility should have a simple recycling display placed in a prominent location. This display should feature the containers to be used with appropriate labels, simple instructions about how to prepare materials for recycling, samples of what is acceptable and unacceptable, information about why we recycle/why it is important, and if possible, samples of products made from recycled materials (especially any products purchased and used by the district).

The district should also consider preparing a more elaborate, professional display that could be used for district-wide events. This display should be designed so as to be readily movable. It could be used during arts and sporting events at each of the schools, whenever parents/school supporters are on campus (such as PTA meetings), and could be rotated among district facilities.

Assemblies – The district should design an assembly around introducing and promoting the district's recycling program. This could be an entertaining, as well as instructional event, incorporating music, dance, drama/acting, art, athletics, and academics. In other words, students can and should play a significant role in the assembly. For example, a choir or ensemble could provide some appropriate music, drama students could do a "sketch" about recycling, art students could provide appropriate artwork, cheerleaders, athletes, or other student leaders could participate, and students could submit essays, poems, and other materials about recycling. The district should also consider inviting vendors to set up appropriate displays that describe the recycling process, including collection and processing of materials and manufacturing products made from the materials.

Once the program is introduced, it would be helpful to incorporate some type of recycling education into future assemblies each year to remind students about the importance of recycling and how to do it, and to encourage their participation.

Recycling Logo/Slogan – The district should develop a logo, mascot, or some other symbol that becomes identifiable with the district's recycling program. The logo could be associated with an athletic mascot, or could be something completely separate in order to apply district-wide. The district should also develop a recycling slogan that promotes participation. Students could develop both the logo/mascot and slogan. Some schools and municipalities sponsor a competition among students to generate ideas. If the artwork is good enough, it could be used as is, or could be refined by a professional artist (perhaps an art teacher) for use as part of the program. The logo and slogan should be incorporated into any written materials that are distributed to students, staff, and faculty, used on posters and any displays, and included in signage used with collection containers.

Student Field Education – While not required, a helpful addition to the district's recycling curriculum would be to include field trips to facilities associated with waste collection/disposal, recycling, and composting. If not all are possible, the focus should be on recycling. Facilities to be considered should include: recyclables processing facilities; end users of recyclables that manufacture products from recycled materials; composting facilities; disposal sites (landfills, or in line with the Dauphin County Municipal Waste Management Plan, an incinerator). These kinds of field trips will help students to understand what happens with the materials they recycle.

Ongoing Reminders – This has been alluded to already. Ongoing reminders include distribution of materials at the beginning of each semester, posters in classrooms, offices, and at other collection points, and incorporation of recycling information into assemblies each year. Including the logo or slogan in other places as appropriate would also serve this purpose.

Clear Signage/Instructions – Recycling bins and stations should be clearly labeled with the materials to be collected, and labels ideally should include visual descriptions of materials and how they are to be prepared. Signage should also include the district's logo and/or slogan (preferably logo).

Student/Staff/Faculty Participation in Planning – The district should include students, staff, and faculty throughout the planning and evaluation process. Even after the program is fully implemented, the district should continue to meet regularly to evaluate the program's success and to make any appropriate changes based on input from the participants. This type of input helps to ensure that the program will meet the needs of all who will use it, and will give participants some "ownership" of the program.

Recognition for Excellence – Students, staff and faculty could be encouraged to participate in the district’s recycling efforts through a recognition program that highlights those who do an exemplary job. Such recognition should probably target classes, offices, or departments, and not individuals. A committee should be formed to determine standards for recognition, which might include amount of materials diverted, cleanliness of materials, or other measurable criteria.

SUMMARY AND RECOMMENDATIONS

Central Dauphin School District has tremendous potential to divert significant volume and tonnage of recyclable materials from its waste stream without increasing its waste management cost. Because all but two facilities are located in municipalities that are mandated to recycle, the question is not whether the district will implement a full-blown recycling program, but how it will establish a program that is efficient and cost effective—and that will potentially result in cost savings for the district. To do this, the district should:

- Implement a comprehensive fiber recycling program in all facilities which includes:
 - Adding corrugated cardboard recycling at the elementary schools as soon as sufficient education can be made available. If the district intends to continue using Waste Management as its service provider for cardboard recycling, it should seek to renegotiate its contract so that the district is not paying a higher price per unit for recycling cardboard than it is for waste disposal. The district should also look into other options for managing its cardboard, including discussions with Spectrum Recyclers or others to manage the district’s cardboard at no cost, as well as using district personnel from each facility to move the material to the Administration Building for baling so that it can be sold and revenue generated to offset costs.
 - Implementing office paper recycling in all facilities as soon as sufficient education can be made available. This includes obtaining sufficient containers from the DEP/PA Department of Education for every classroom and office area in the district, and working with Spectrum Recyclers to provide storage containers and collection services for the office paper.

NOTE: Even though the two facilities in non-mandated municipalities are not required to implement recycling, the district should do so for at least two reasons. First, the municipalities where these facilities are located have, in fact, implemented municipal recycling programs. Having a program in the schools reinforces what children/families are doing at home, and can help to boost the municipalities’ recycling rates, making them eligible for additional funding through the Section 904 Performance Grant program. Second, it is easier to implement a program that is consistent throughout all facilities in the district, and the district stands to achieve higher recycling rates, greater reduction in disposal costs, and additional (potential) revenue from the diverted materials (depending on how the materials are managed).

- Establish a comprehensive recycling education program that includes use of resources offered by Dauphin County and Spectrum Recyclers. Students, teachers, and staff should be part of both the planning and evaluation process in order that the program meets the needs of all participants and results in a successful program.
- Over time, perform a more comprehensive waste assessment to get a better understanding of its waste stream and the options available for managing it more efficiently to increase and improve recycling and waste reduction efforts.
- Explore methods for recycling PET soft drink bottles, which make up a significant portion of the waste stream at the junior highs and high schools. The district should seek help from Coca Cola to recycle these bottles as a condition of the company’s contract with the district.
- Contact Dart Container to explore the potential for recycling of disposable polystyrene trays used in the cafeterias at many of the schools. Diversion of these trays will significantly reduce the district’s waste volume and offers the potential for lowering waste disposal costs by enabling the district to reduce the number of dumpsters or collections at schools that use the trays. Dart’s local sales representative, John Bechtel, may be reached at (717) 790-1582.

- Consider recycling #10 steel cans and plastic jugs from school cafeterias if a reasonable process can be developed for storing the containers until there is a sufficient amount that can be delivered for processing. Alternatively, these containers could be managed more informally—as is done with aluminum cans—by persons willing to take the containers to one of the Dauphin County drop-off locations.

By implementing a comprehensive recycling program, the district will be managing its wastes in a more responsible manner, may experience cost savings, and will send an important message to students, faculty, staff, and the community that recycling and waste reduction are important methods for protecting our environment and our future.

Sincerely,

R. W. BECK, INC.

Sandra L. Strauss
Environmental Analyst

cc: Carl Hursh, DEP
Clarence Fidler, Central Dauphin School District
DEP Southcentral Region