

Recommendations for Planning and Developing a Regional Compost Facility Through Intermunicipal Partnerships

Bucks County



Upper Black Eddy, Pennsylvania
Bucks County

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BACKGROUND

The Pennsylvania Department of Environmental Protection (PaDEP), the Governor's Center for Local Government Services, the Pennsylvania State Association of Township Supervisors (PSATS) and the Solid Waste Association of North America (SWANA) formed a training partnership for Pennsylvania local governments interested in achieving higher recycling rates. Through this partnership, Bucks County was awarded \$6,000 in technical assistance services from Gannett Fleming, Inc. to evaluate the feasibility of developing a yard waste composting program serving all of central Bucks County through the development of municipal partnerships.

INTRODUCTION

Recycling programs are operated through coordination of public and private entities within Bucks County. The County's role is to oversee and facilitate these programs. There are two privately operated Material Recovery Facilities (MRFs) within the County, one private composting facility, 44 municipalities with curbside recycling programs, and 26 with drop-off programs.

Waste Management operates a private 15-acre composting facility in Tullytown Borough, which serves several municipalities in the southern portion of Bucks County. Browning-Ferris Industries (BFI) operated a composting facility in the central Bucks County area until 1999. BFI leased 5-acres of Highland Hill Farms, which is just north of Doylestown, to provide composting services for several neighboring municipalities. The site produced 9,000 to 11,000 tons of compost during its peak years of operation, which was sold to local markets. In 1999, BFI discontinued the operation when the volume of material necessary to earn an adequate profit could no longer be maintained. BFI sold its composting equipment for this site in 1999.

Residents and landscapers in the central region of Bucks County have expressed interest in reestablishing a composting facility for grass clippings and leaves. The County hoped to facilitate this process by requesting technical assistance to quantify the potential volume of yard

waste, and to discuss the administrative options that are available to establish a workable and sustainable composting operation.

The establishment of a composting facility complements the desire of several municipalities in central Bucks County to initiate anti-leaf burning ordinances. Of these municipalities, Doylestown Township formed an Environmental Advisory Committee (EAC) in 1997 to research alternatives to burning, and to provide public education on the alternatives. On July 3, 2001, representatives from the County of Bucks, Doylestown Township, Warwick Township, Browning-Ferris Industries (BFI), and Gannett Fleming, Inc. met to discuss municipal yard waste composting in the region.

SCOPE OF SERVICES

Lale Byers and Ray Regan, Jr. worked together to develop the following tasks for this SWANA project:

- Task 1:** Investigate and discuss potential partnership types from survey results of other similar composting programs in Pennsylvania.
- Task 2:** Quantify the volume of material to be expected on the basis of estimates from local yard waste collection programs.

NEW DEP POLICY FOR 902-GRANT APPLICANTS

On January 30, 2002, the DEP distributed a policy entitled, "Act 101 Section 902 Recycling Grant Application Guidelines Regarding Proper Management of Recyclables, Including Leaf Waste." Municipal officials who would like to consider developing a yard waste composting program through the Section 902 grant program should review this document, which is included as **Appendix A**.

Task 1: Composting Partnerships.

Municipalities in the central region of Bucks County have expressed a need for a regional composting facility. Planning and implementing a regional composting facility can be approached several ways. One of the initial steps to consider is responsibility for development of the site and ownership of the composting equipment. If a private entity has not expressed an interest in owning and operating a facility, then by default the responsibility becomes a public interest. It cannot be expected that a private entity will initiate a composting facility in the future. Composting often incurs a cost rather than a profit; and DEP grant programs are not available to private entities directly.

There are two basic alternatives for the development of a composting site in the public sector. Either the County or local municipalities can choose to be responsible for site development and ownership of the equipment. In the case of composting, where several municipalities can be served by one site, local responsibility can take the form of an intermunicipal partnership, such as an Authority, Council of Governments (COG), or an intermunicipal agreement. Operation of the facility can be handled either with municipal hires or put out for competitive bid among private establishments.

The recommended approach to composting is based on interviews with County, municipal, and professional composting officials. The list includes Cary Oshins of Lehigh County, Mark Whitfield of the Borough of State College, and John Frederick of the Professional Recyclers of Pennsylvania (PROP). Contact information and interview notes are provided in **Appendix B**.

As suggested in the interviews, the County can oversee and assist with the formation of an intermunicipal agreement on composting. The County can assist with site selection, invite local municipalities to participate in the program, and provide guidance on the administrative needs of program development. A suggested list of municipalities to include in a partnership is presented in the next section of the report.

The interviewees did not have a strong recommendation on public or private operation of the composting program. Selection of one often depends as much on personal preferences in attending to administrative tasks as it does financial and technical factors. In the case of Bucks County, there are several private organizations that are qualified to provide composting services. An advantage of private operation is that it can reduce the administrative time involved in such tasks as scheduling for equipment maintenance, permit issues with the site, market development, and attending to questions from local residents. Public operation can often provide the same assurances for quality control, and can be less costly than private operation, but requires the staff to attend to a greater number of administrative tasks.

For a publicly-owned intermunicipal facility, three partnership levels exist: an Authority, a COG, and an intermunicipal agreement. The level of partnering, once again, depends on the comfort of the participating municipalities. Regardless of the type of partnership formed, it is recommended that all policies and procedures are established in writing, and that responsibility is shared equitably for operational expenses, insurance, and incidentals. An example intermunicipal agreement for composting can be provided to the County, if desired.

Partnering municipalities have the option to request 902-grant reimbursement from the State for the development of a composting facility. In an intermunicipal structure, one municipality must act as lead on the 902-grant application. Once the grant is awarded, the title for the equipment can then be placed in the name of the partnership.

At this point in the planning process, some preliminary cost estimates as well as a list of equipment to consider can be offered, but site development costs are reserved until a later time. Composting equipment to consider includes a wood chipper, tub grinder, skid loader, hauling truck, a compost screener, windrow turner, a tractor with a bucket, and miscellaneous support equipment such as thermometers, pH probes, and compost stability kits. Even if more than one regional composting facility is established, the partnering municipalities should consider the purchase of one set of equipment, which can be transported to the various sites, as needed. Equipment, site development, and planning are significant costs, but vary greatly with existing

site conditions and locality. It should be noted that operational and maintenance (O&M) costs are not covered under the 902-grant program.

There are several alternatives for covering the costs of operating and maintaining a composting facility. Lehigh County reports that O&M costs are approximately \$3 per cubic yard of pre-compost material. This cost can be added to the service contract with residents for curbside refuse pickup as a fee adjustment or surcharge. Some of the 904-performance grant money that municipalities receive for recycling could be used to cover the costs of composting. The sale of compost material can also provide some revenue. Compost material can be sold either as a registered product with the Department of Agriculture or sold as an unregistered product if it has a sufficient number of disclaimers regarding quality.

When establishing a service charge to residents, municipalities might also consider the potential benefit of operating a compost facility. An internal source of compost material to use as soil amendment or mulching can reduce the cost of landscaping at municipal facilities.

Task 2: Estimate for the Volume of Yard Waste to Anticipate

Yard waste is defined as leaves, grass clippings, garden residue, tree trimmings, chipped shrubbery, and other vegetative material. To quantify the volume of material to expect with a regionalized composting program, the first step is to determine which municipalities are best served by such a program. We selected the municipalities in central Bucks County because residents and landscapers in this area have expressed an interest in a composting facility. Several municipalities in the southern portion of the County, starting as far north as Northampton Township, have a contract with Waste Management Inc. for leaf collection services. Municipalities in the northern part of the County do not appear to have a centralized composting facility, and might have an interest in one, as well. Certainly, this SWANA report can assist them with the development of a program, but this section focuses on the process for central Bucks County.

If we consider the central Bucks region to be one-third of the County and eliminate the municipalities served by Waste Management, then there are 11 municipalities to include in the study. These municipalities are:

1. Buckingham Township
2. Chalfont Borough
3. Doylestown Borough
4. Doylestown Township
5. New Britain Borough
6. New Britain Township
7. New Hope Borough
8. Plumstead Township
9. Solebury Township
10. Warrington Township
11. Warwick Township

A municipal map of these 11 municipalities is presented in **Figures 1A** and **1B**. This list is used to provide an estimate of the tons of yard waste to expect, which, in turn, can be used to estimate spatial requirements of a regional composting facility.

The County requests tonnage reports annually for recyclable materials, including yard waste, from each municipality. None of the municipalities in the central Bucks region had numbers to report for tons of yard waste collected from 1997 to 1999. Eleven other municipalities in Bucks County, however, provided tonnage reports, and these reports were used to estimate the potential tonnage of yard waste from municipalities in central Bucks County.

The most precise method of predicting yard waste tonnage is to measure landscaped and wooded areas in residential, commercial, and industrial zones from aerial photographs. Due to the large number of maps required for a study of central Bucks County, we used an alternative method. The method uses the reported tons of yard waste from lower Bucks County to predict the tons of yard waste to expect from municipalities in central Bucks. This alternative method lacks precision because lower Bucks County is more developed than central Bucks. Therefore, the data from one region is not directly applicable to another.

To account for differences in regional development, we used the data available from reporting municipalities in lower Bucks County to first calculate the average tons of yard waste generated per square mile as 175. We then calculated the average tons of yard waste generated per person as 0.08. When we applied these average values to municipalities in central Bucks County, the

result was two different estimates for the amount of yard waste generated, and consequently the size of the composting facility that is needed. We feel that the appropriate estimate lies somewhere between these two values. The two estimates (the one resulting from population data and the other from spatial data) are considered a range with upper and lower boundaries for planning. Additional details are provided in **Appendix C**, and the assumptions are outlined below:

- *Estimated Tons of Yard Waste*: The first estimate is calculated by multiplying the land area in square miles by 175 tons of yard waste per square mile. A second estimate is calculated by multiplying the population by 0.08 tons of yard waste per person per year.
- *Estimated Cubic Yards (CY) of Yard Waste*: The volume of yard waste in cubic yards (CY) is estimated by assuming that an average load of leaf waste weighs 300 pounds per cubic yard (lb/CY), yard waste weighs 500 lbs/CY, and typically composting facilities receive a 50:50 mix of leaf waste to yard waste by weight.
- *Estimated Acreage for Compost Pad*: The DEP recommends a maximum of 3,000 cubic yards of yard waste to be composted per acre. Therefore, the estimate is based on the estimated cubic yards of yard waste divided by 3,000.
- *Estimated Acreage for Composting*: Storage space for finished compost is also required. Often, spatial requirements for storage are half of the area required for the composting pads. The total estimated acreage for composting becomes the estimate for the compost pad times 1.5.

Guidance for these assumptions is from the “Municipal Yard Waste Composting Reference Manual,” 1991. Additional acreage is necessary for staging and equipment storage, but is not included in the estimated acreage for composting. Often, two acres should be set aside for staging and equipment storage per site. The amount of space required for staging is somewhat independent of the size of the composting operation. It should be noted that the values in **Table 1** for both tons of yard waste and cubic yards of yard waste are presented in thousands.

Table 1: Estimated Tons of Yard Waste for Central Bucks County Municipalities

Ref #	Municipality	2000 Census Population	Land Area (Sq. Miles)	Estimated ³ Tons of Yard Waste (1000s)	Estimated ³ CY of Yard Waste (1000s of CY)	Estimated ³ Acreage for Compost Pad	Estimated ³ Acreage for Composting
1	Buckingham TWP ¹	16,442	33.1	1.3 to 5.8	6.6 to 30	2.2 to 10	3 to 15
2	Chalfont Borough ²	3,900	1.7	0.3 to 0.3	1.5 to 1.5	0.5 to 0.5	1
3	Doylestown Boro ¹	8,227	2.2	0.4 to 0.7	2.0 to 3.3	0.7 to 1.1	1 to 2
4	Doylestown TWP ¹	17,619	15.5	1.4 to 2.6	7.0 to 14	2.3 to 4.7	4 to 7
5	New Britain Boro ²	3,125	1.3	0.2 to 0.3	1.2 to 1.3	0.4 to 0.4	1
6	New Britain TWP ¹	10,698	14.7	0.9 to 2.6	4.2 to 13	1.4 to 4.3	2 to 7
7	New Hope Boro ²	2,252	1.3	0.2 to 0.2	0.9 to 1.2	0.3 to 0.4	1
8	Plumstead TWP ¹	11,409	27.2	0.9 to 4.8	4.6 to 24	1.5 to 8.0	2 to 12
9	Solebury TWP ²	7,743	26.6	0.6 to 4.7	3.1 to 24	1.0 to 8.0	2 to 12
10	Warrington TWP ¹	17,580	13.8	1.4 to 2.4	7.0 to 12	2.3 to 4.0	4 to 6
11	Warwick TWP ¹	11,977	11.1	1.0 to 1.9	4.8 to 10	1.6 to 3.3	3 to 5
Mandated Municipalities		93,952	117.6	7.5 to 21	38 to 103	13 to 34	19 to 51
All 11 Municipalities		110,972	148.5	8.9 to 26	44 to 130	15 to 43	22 to 65

Shaded areas represent calculated number and the assumptions are presented in Appendix C

CY is the notation for Cubic Yards

Note 1: Mandated municipality either because population is greater than 10,000 or population is greater than 5,000 with a population density greater than 300 people per square mile

Note 2: Non-mandated municipality

Note 3: One estimate is based on population and the other is based on land area, which creates a range of values.

The use of both population and spatial data created an upper and lower range for estimating the appropriate acreage of a yard waste composting facility. In the cases of Buckingham, New Britain, Plumstead, and Solebury Townships, there is a large difference between the upper and lower values. The extent of agricultural land in these municipalities suggests that the estimated size for a composting facility is closer to the lower value than the higher one. For Doylestown Borough and Doylestown, Warrington, and Warwick Townships, the upper and lower estimates are fairly close, and a midpoint value is probably appropriate for sizing a composting facility. As an example, use four acres for Warwick Township since the estimate is between three and five. Finally, for Chalfont, New Britain, and New Hope Boroughs, estimates based on both population and spatial data provided the same result, which was one acre in each case.

Seven of the 11 municipalities in **Table 1** are mandated under Act 101 to implement source separation of recyclables either because the population is greater than 10,000 or the population is greater than 5,000 with a population density greater than 300 people per square mile. The seven mandated municipalities in **Table 1** are more likely to be receptive to a partnership for composting than the non-mandated communities. Therefore, **Table 1** presents a separate number for tons of material to expect for the seven mandated municipalities.

We don't expect that the County will find all of the acreage necessary to serve the composting needs of central Bucks County in one location. The process, rather, should be to search for potential sites of at least 10 to 15 acres. Then, once an acceptable site is located, invite municipalities to participate. **Table 1** can be used to determine which municipalities and how many of them to include in a centralized composting facility.

An acceptable site has the following characteristics:

- It is not within a 100-year flood plain.
- It is not within 300-feet of a water source.
- It is not within 300-feet of an exceptional value wetland.
- It is not within 100-feet of a wetland other than an exceptional value wetland.
- It is not within 100-feet of a sinkhole or area draining into a sinkhole.
- It is not within 300-feet measured horizontally from an occupied dwelling unless the owner has provided a written waiver of consent.
- It is not within 50-feet of a property line unless the facility operator can demonstrate that only curing compost is within this setback requirement.

The places to search for an acceptable composting site include municipalities with publicly-owned land available. Capped landfills often make good composting sites. Non-profit organizations and societies might also have land available. Finally, private entities might have an interest in leasing arrangements for land. The County could solicit interest through advertisements in the local media.

CONCLUSIONS AND RECOMMENDATIONS

Composting is more of a public service than a capital venture. Participating municipalities should expect to incur a cost for composting, which can be covered through an adjustment to the curbside refuse services for residents. For a publicly operated facility, the benefit to residents and municipalities is a free or low cost source of landscaping material in return. Composting also provides an alternative to leaf burning, which should help municipalities to establish anti-burning ordinances. Public education on composting will be critical throughout this process, and should begin as soon as possible.

We recommend the following steps to implementing an intermunicipal partnership for composting in Bucks County.

- Submit a 902-grant application at the County level to request educational materials on composting. Brochures for grass cycling and backyard composting are available from the DEP. The County can also consider brochures and advertisements to announce the plans for a composting facility.
- Locate an area of reasonable acreage to use for composting in one of the 11 central Bucks County municipalities. Local municipalities may have public land available. If not, the County might consider contacting commercial and industrial authorities, such as the Chamber of Commerce, about the availability of commercial property, or posting an advertisement in the newspaper to request a leasing agreement with private landowners.
- Once a site or multiple sites are located, the County can develop a list of municipalities who could potentially share the site. The selection of municipalities to include should consider proximity to the planned site, the estimated tons of yard waste from **Table 1**, and spatial limitations posed at site.

- Once some semblance of a working partnership is in-place among selected municipalities, the County should consider a support role for further development of an Authority, Council of Governments, or intermunicipal agreement on composting.
- The County should also inform the local municipalities of the new DEP provisions related to leaf burning for 902-grant applicants. This new policy, which the DEP intends to enforce as a means of protecting its investment in recycling, will affect the County's efforts to locate a feasible composting site. Not all of the participating municipalities need to have anti-leaf burning ordinances to be included in an intermunicipal composting operation, but the host municipality should have one. Guidance from the Southeast Regional Office of the DEP can be sought for additional details on the Department's stance on grant funding for composting programs.