



September 21, 2001

Ms. Ilene M. Eckhart
Manager
Allen Township
4714 Indian Trail Road
Northampton, PA 18067

Subject: Assessing Feasibility of Establishing a Regional Yard Waste Management Facility in Northampton County

Dear Ilene:

This letter is to provide Allen Township with the results of R.W. Beck's efforts to assess the feasibility of developing, implementing and promoting a regional yard waste management facility for Allen, Bushkill, East Allen, Lehigh, and Moore Townships (Northampton County).

Only one of these municipalities—Lehigh Township—is mandated to recycle leaf waste under the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101). Allen and East Allen Townships, with less than 5,000 people each as of the 2000 Census, are not mandated. Bushkill and Moore Townships each have over 5,000 people as of the 2000 Census, but with population densities of less than 300 people per square mile, they are not mandated to recycle. Given the state's new goal of 35 percent recycling by 2003, however, the PA Department of Environmental Protection (DEP) is encouraging counties and municipalities to recycle more materials. Yard waste is one of the greatest contributors to the waste stream, and diverting this material in these municipalities would provide a significant contribution toward boosting the County's recycling rate.

PLANNING AND IMPLEMENTING A REGIONAL YARD WASTE COMPOSTING SITE FOR ALLEN, BUSHKILL, EAST ALLEN, LEHIGH AND MOORE TOWNSHIPS

This report assumes the following:

- These municipalities have not collected leaf waste or performed active composting in the past, so the volume and/or weight of material that would be collected is unknown.
- All material collected would be managed at one, or perhaps two, regional sites.

To assist Allen Township in assessing the need for and what is required to establish a yard waste management facility for Allen, Bushkill, East Allen, Lehigh and Moore Townships, R.W. Beck is providing the following:

- Estimated composting/processing area required.
- Physical requirements for a yard waste management facility.
- Implementation factors and estimated costs.

YARD WASTE VOLUMES AND SITE SIZE REQUIREMENTS

As noted above, Allen, Bushkill, East Allen, Lehigh and Moore Townships have not been collecting or managing leaves/yard waste in any kind of systematic manner, so the volume and/or weight that might be expected is unknown. Therefore, it is necessary to estimate the amount of material that a regional site might receive to assess the size needed for the site. The method for developing estimates uses data obtained from Lehigh County for its regional composting site. Data from this site should provide a reasonable indicator for a Northampton County site, since the area generating these materials in Lehigh County borders on the portion of Northampton County considering the regional site. Only data from municipalities collecting all materials was used, with the assumption that generation documented from these municipalities is probably a better indicator of what the municipalities in Northampton County might generate. Table 1 provides estimates by municipality for the volume of materials that might be collected in a regional program in Northampton County, excluding grass, which will be considered later.

TABLE 1
ESTIMATED YARD WASTE GENERATION—VOLUME IN CUBIC YARDS
NORTHAMPTON COUNTY REGIONAL COMPOST SITE

Municipality	Population	Estimated Volume (cubic yards)		
		Leaves (1)	Mixed Yard Waste (2)	Totals (3)
Allen Twp	2,630	158	631	789
Bushkill Twp	6,982	419	1,676	2,095
East Allen Twp	4,903	294	1,177	1,471
Lehigh Twp	9,728	584	2,335	2,918
Moore Twp	8,673	520	2,082	2,602
Totals	32,916	1,975	7,900	9,875

(1) Assumes leaves alone is 20% of volume collected

(2) Assumes mixed yard waste (leaves and brush) is 80% of volume collected

(3) Assumes generation is .3 cubic yards per person annually (based on data provided by Lehigh County)

Table 2 provides estimates by municipality for the tonnage of material based on estimated volumes, and Table 3 provides an estimate for waste diversion if leaves and mixed yard waste are collected and composted at a regional site in Northampton County.

TABLE 2
ESTIMATED YARD WASTE GENERATION--TONNAGE
NORTHAMPTON COUNTY REGIONAL COMPOST SITE

Municipality	Population	Estimated Tonnage		
		Leaves (1)	Mixed Yard Waste (2)	Totals (3)
Allen Twp	2,630	35.54	165.67	201.21
Bushkill Twp	6,982	94.35	439.81	534.16
East Allen Twp	4,903	66.26	308.85	375.11
Lehigh Twp	9,728	131.46	612.79	744.25
Moore Twp	8,673	117.20	546.33	663.53
Totals	32,916	444.81	2,073.45	2,518.26

(1) Assumes 4.44 tons per cubic yard

(2) Assumes 3.81 tons per cubic yard

TABLE 3
ESTIMATED DIVERSION RATE
NORTHAMPTON COUNTY REGIONAL COMPOST SITE

Municipality	Population	Estimated Waste Generation	Total Yard Waste Tonnage	Diversion Rate
Allen Twp	2,630	2,104.0	201.21	
Bushkill Twp	6,982	5,585.6	534.16	
East Allen Twp	4,903	3,922.4	375.11	
Lehigh Twp	9,728	7,782.4	744.25	
Moore Twp	8,673	6,938.4	663.53	
Totals	32,916	26,332.8	2,518.26	9.56%

Table 4 presents the total acres required for composting based on a maximum of 3,000 cubic yards per acre, as required in the *Guidelines for Yard Waste Composting Facilities* issued by the Pennsylvania Department of Environmental Protection (DEP).

TABLE 4
TOTAL AREA REQUIRED FOR
REGIONAL COMPOSTING SITE (IN ACRES)

Category	Acreage Required
Active composting	3.29
Staging/Storage	1.00
50 ft. buffer (minimum)	2.01
TOTAL	6.30

Table 4 indicates that a minimum of 3.29 acres is required for the active composting area alone, based on the estimated volumes of materials that might be received as illustrated in Table 1. An additional acre would be needed (at a minimum) for staging and storage, as well as at least a 50-foot buffer zone. The additional area needed, based on these minimum requirements, is approximately three acres, thus nearly doubling the area needed to establish a new site. It is probably best to assume that an area of eight to ten acres would be best for a composting site to service the five municipalities, as the additional space would permit some room for expansion and additional buffer if needed.

Given the distances that may be involved to transport yard waste to a regional site, it may be helpful to consider a potential satellite/transfer site for each municipality. This need not be a large area, because materials will only be collected for a short time to be consolidated and moved to a central site. Considerations include how materials will be consolidated, whether in a rolloff or similar container, or whether they will be dumped and then reloaded into some type of compaction vehicle (not the preferred method--efficiency is the key factor in the consolidation) and the space required to maneuver equipment. The materials cannot be permitted to accumulate for any length of time or the municipality may face action by DEP for operating a composting operation outside the DEP *Guidelines for Yard Waste Composting Facilities*.

Grass

As noted in a table later in this report that summarizes the responses to a questionnaire distributed to five municipalities in Lehigh County, three indicated an interest in including grass for composting, one indicated it might be interested, and the other indicated no interest. Table 5 presents an estimate of the weight and volume of grass that might be expected at a composting site that services these municipalities, based on the experience of the City of Allentown.

TABLE 5
ESTIMATED GRASS GENERATION

Municipality	Population	Tonnage (1)	Volume (cu.yd.) (2)
Allen Twp	2,630	14.5	4.70
Bushkill Twp	6,982	38.4	12.47
East Allen Twp	4,903	27.0	8.76
Lehigh Twp	9,728	53.5	17.37
Moore Twp	8,673	47.7	15.49
Totals	32,916	181.0	58.78

(1) Estimated using generation of 11 pounds/person annually, based on data from Allentown

(2) Estimated at 3.08 tons per cubic yard, based on data from Allentown

If anything, these numbers may overestimate the amount of grass that might be expected, since Allentown has an active grass collection program that has been in place for several years, and is considered an urban area. It is unlikely that grass will be bagged for collection or delivery to a composting site in some of the more rural parts of the five-municipality area.

At the generation rate indicated in Table 5, the amount of grass that might be delivered to an intermunicipal site is unlikely to cause a need for a larger site or to have significant impact on the operations of a site.

LOCATION OF COMPOST SITE

DEP's *Guidelines for Yard Waste Composting Facilities* specify that composting operations, including storage, composting and curing, shall not take place in the following areas unless the operator takes special precautions and obtains written authorization from the Department:

- In a 100-year flood plain
- In or within 300 feet of an exceptional value wetland
- In or within 100 feet of a wetland other than an exceptional value wetland
- Within 100 feet of a sinkhole or area draining into a sinkhole
- Within 300 feet measured horizontally from an occupied dwelling unless the owner has provided a written waiver consenting to the facility being closer than 300 feet
- Within 50 feet of a property line, unless the operator demonstrates that only curing of compost is occurring within that distance
- Within 300 feet of a water source
- Within 3.3 feet of a regional groundwater water table
- Within 100 feet of a perennial stream

In addition, access to the site must be controlled, so the site must be in a location where such control is possible. Vehicle access points must be gated or protected by some other barrier. Sites with natural barriers or those that are somewhat remote are preferable because they are less visible and therefore less prone to be entered by unauthorized persons, and generally less likely to cause problems because of proximity to occupied dwellings or businesses.

Two potential sites have been identified, one in Allen Township, and one in East Allen Township. While both sites would need to be assessed to determine whether or not they meet the requirements listed above, another major factor to consider is accessibility to the other municipalities that will be participating in the composting effort. East Allen is slightly more central, but sites in either municipality (Allen or East Allen) will require fairly lengthy transport distances from portions of Bushkill, Lehigh and Moore Townships. If both potential sites can meet the DEP *Guideline* requirements, the road system should be assessed to determine which is the best location from the standpoint of transporting materials from other parts of the area.

IMPLEMENTING AND OPERATING A YARD WASTE COMPOSTING SITE

In order to establish a new regional compost site, the host municipality or entity responsible for the site must submit a Yard Waste Composting Facility Application Form that provides the information required by DEP for site approval. The applicant must demonstrate that siting and operational requirements will be met.

Table 6 illustrates the estimated cost for operating a regional composting facility. The estimates are based on cost data from the Lehigh County facility. Because of the size and assumed economies of scale to operate the Lehigh County site, it is assumed the cost per cubic yard for operations will be proportionately higher for a regional site in Northampton County. Lehigh County's costs have averaged \$2.07 per cubic yard for operations from 1992 through 1999, with a range from \$.87/cubic yard (1992) to \$3.01/cubic yard (1999). It should be noted that this has not been a continuous upward curve from 1992 through 1999, but has varied from year to year. For example, it should be noted that the third lowest per unit rate (\$2.17/cubic yard) was achieved in 1998, just prior to the highest. Volumes were greater in 1998 than they had been in any year since 1992, so it is likely that the greater volume was spread over similar fixed cost.

TABLE 6
ESTIMATED OPERATING COST PER CUBIC YARD – MUNICIPAL OPERATION

Municipality	Est. Volume	Low (1)	Moderate (2)	High (3)
Allen Twp	789.0	1,972.50	3,156.00	4,339.50
Bushkill Twp	2,094.6	5,236.50	8,378.40	11,520.30
East Allen Twp	1,470.9	3,677.25	5,883.60	8,089.95
Lehigh Twp	2,918.4	7,296.00	11,673.60	16,051.20
Moore Twp	2,601.9	6,504.75	10,407.60	14,310.45
Totals	9,874.8	\$24,687.00	\$39,499.20	\$54,311.40

- (1) At \$2.50/cubic yard
- (2) At \$4.00/cubic yard
- (3) At \$5.50/cubic yard

Other options for site operation include hiring a private contractor to operate the site, or finding a nursery, landscaper, or similar business that is willing to manage yard waste from the five municipalities for a fee. It is unknown what these costs would be, or even if any entities exist within the area that could manage these materials under a contract arrangement. While the data are somewhat dated, costs observed in similar projects in western Pennsylvania ranged from slightly more than \$2.00 per cubic yard for processing to \$29 per cubic yard.

Table 7 provides information on equipment that should be considered if a new regional compost site is to be developed.

Any equipment needed for operating a composting facility is eligible for up to 90 percent funding under the Section 902 grant program authorized under Act 101. Application for any equipment that can or will be used for other purposes will be scrutinized carefully by DEP and funding may be made available only on a prorata basis determined by the percentage of time the equipment is anticipated to be used for yard waste management. All operational costs must be borne by the operator/users of the site. Act 101 does not permit the use of grant funding for operations.

TABLE 7
POTENTIAL EQUIPMENT FOR USE AT A COMPOSTING FACILITY

Equipment	Cost Range	Capacity Range	Comments
Windrow Turning Equipment	\$40,000-\$80,000		Windrow turning attachment, requires front end loader/tractor
Front End Loader	\$100,000		Needed to form windrows and to push or pull windrow equipment
Chippers and Shredders	\$15,000 - \$100,000	20 yd ³ – 200 yd ³ /hr	Includes both Shear Shredders and Hammermills. Loader may be needed to feed hopper.
Tub Grinders	\$50,000 - \$150,000	10 tons – 50 tons/hr	Loader and/or knuckle boom may be needed to feed hopper.
Screens	\$60,000 - \$150,000	10 tons – 50 tons/hr	Loader and/or knuckle boom may be needed to feed hopper
Thermometers • Analog • Digital	\$50 - \$150 \$300 - \$750		Stem needs to be 3 to 4 feet long. Temperature range should be 0 ⁰ to 200 ⁰ F

FUNDING A YARD WASTE COMPOSTING SITE

The most equitable method of funding the cost to operate a regional composting facility is for each participating municipality to pay a per unit (probably cubic yard) fee for materials delivered to the site. If each municipality contributes personnel time toward management of the site, the unit fee should be based on the non-personnel costs to operate the site. If one municipality operates the site, the other municipalities should pay a proportionately higher fee that helps to cover a fair portion of the personnel cost for the municipality that operates the site.

The participants may want to consider accepting materials from other sources such as landscapers, nurseries, institutions or businesses for a fee as a means of gaining additional revenues for operating a site. It should be noted that depending on demand, additional land might be needed, plus additional security and site supervision to ensure that additional materials are managed adequately. It would probably increase overall cost, but this increase may be worthwhile if the economies of scale reduce the unit cost for processing for everyone. Private sector participants could pay fees based on a fair market rate, and even further offset the cost to municipal participants.

ASSESSING MUNICIPAL INTEREST

In order to assess the interest and potential level of participation of the other municipalities that would potential participate in a regional composting site (Bushkill, East Allen, Lehigh

and Moore Townships), a survey has been prepared to collect information about the following:

- Demographic data (population and housing units)
- Whether or not municipality is currently collecting yard waste, and if so, what materials and how
- Interest in participating in a program, particularly interest in the following areas:
 - Labor sharing
 - Cost sharing
 - Entering into an intermunicipal agreement
- If materials are currently being composted, where they are going and the cost, and whether or not there is data that could be shared
- If there is no activity at present, how the municipality might like to manage collection
- Whether or not the municipality has a potential site that could be used for composting
- How finished compost should be managed

A copy of this survey is included as Attachment 1 to this report.

Some of the more pertinent results are as follows:

- All five municipalities indicate an interest in participating in an intermunicipal composting project.¹
- All five have responded that they are willing to share cost.
- All but one have responded that they are²:
 - Willing to share labor
 - Willing to enter into an agreement
- Lehigh Township (the only mandated municipality) is currently the only municipality that is collecting yard waste at the curb. Three prefer that materials be dropped off, while the fourth indicated that it is not sure.
- Three municipalities indicated an interest in including grass clippings, one was not sure, and the other said it was not interested.
- The survey confirmed the potential for two sites as described earlier in this report.
- Four of the five municipalities included selling finished compost to residents and businesses as one of the preferred methods of distribution, with one designating this as its only preferred method of distribution.³

Of course, responses given in a survey of this type are not binding, and there is no guarantee that all will come to agreement when actual cost figures and personnel needs are

¹ Lehigh Township responded “No” to this question, but all other responses, including a comment at the end, indicated that the Township is in fact interested in participating.

² Bushkill Township did not respond “No,” but simply did not respond at all to either of these questions.

³ If material is to be sold, testing is required by the PA Department of Agriculture to measure specified nutrient levels. This may not be the preferred way to manage distribution of the material. It should be noted, however, that municipalities may offset the cost of distribution by charging a fee to cover distribution costs only—that is, the cost to the municipality for personnel, administrative time, equipment, etc.

applied, but it does appear that there is strong potential for the implementation of a composting site to service the five municipalities.

CONCLUSIONS

- Five Northampton County municipalities—Allen, Bushkill, East Allen, Lehigh, and Moore Townships—have indicated an interest in participating in an intermunicipal composting program involving a site or sites that would service all municipalities.
- Only one municipality—Lehigh Township—is mandated to collect leaf waste and is currently collecting materials at the curb.
- The tonnage and volume of material generated in these municipalities is unknown. The estimated tonnage is 2,518 tons, and estimated volume is 9,875 cubic yards, based on the experience of Lehigh County municipalities participating in an intermunicipal site.
- Based on estimated volume, a minimum of approximately 6.5 acres is required for a composting site to service all five municipalities. It is probably best to plan for a site that allows for expansion if required.
- Cost is highly dependent on economies of scale; that is, the more material that comes into a site, the lower the cost per unit to process.
- Grant funding is available to purchase equipment needed for a site, collecting materials and for public education.
- A survey of five municipalities indicates that all have an interest in participating in an intermunicipal composting program/site.

RECOMMENDATIONS

- The five Townships should meet to begin discussing the specifics of planning, implementing and operating an intermunicipal composting program/site. If agreement is reached to proceed, the municipalities should:
 - Determine the preferred site or sites to be used for the active composting of yard waste and meet with the owner to discuss the terms for purchase of or use of the site.
 - Enter into an agreement to proceed with discussions, pending final determination to establish a composting site or sites.
 - Set up a meeting with the DEP Northeast regional office to discuss submission of a grant application to purchase equipment and cover the cost of public education.
- When all details concerning site and grant funding have been determined, if the decision is to proceed with site development and implementation of a program, the Townships should:
 - Enter into an agreement that outlines the roles that each municipality will take on with regard to the program/site, including expenses needed to operate the site.

Ideally, one municipality should function as the lead municipality with regard to administration and submission of grant applications.

- Determine the specific equipment that is needed for the site and obtain cost estimates.
- Determine the cost to develop the site, based on DEP's ***Guidelines for Yard Waste Composting Facilities***.
- Determine the education program to be used to encourage participation by residents.
- Determine the estimated cost to operate the site based on the management structure outlined by intermunicipal agreement. Costs for equipment operation, maintenance and replacement should be included in the estimated annual cost
- Determine whether or not to accept materials from private sector businesses such as landscapers, etc., and fees to be charged to these entities to manage their materials.
- Determine how finished compost will be used and/or distributed.
- Prepare a grant application to obtain funding for all eligible costs.
- Develop a procedure for collecting data on material that will be delivered to the site for reporting purposes and to determine what adjustments may be needed once the facility is operating.
- Prepare and submit a ***Yard Waste Composting Facility Application Form*** as required by DEP. Copies of this form may be obtained from the DEP regional office.
- Once a grant is awarded, develop the site and purchase any equipment deemed necessary for operating the site.

Given the relatively small cost estimated to operate the facility, the potential for savings to residents for avoided cost (that is, not paying to dispose of yard waste) and the state's goal of 35 percent recycling by 2003, the five municipalities could benefit significantly from implementing an intermunicipal composting program/site to manage their yard wastes. The group could also provide a positive example for other municipalities in eastern Pennsylvania who are not mandated to recycle but who could benefit from such a program.

Sincerely,

Sandra L. Strauss
Environmental Analyst

cc: Kathleen Kilbane, SWANA
Carl Hursh, DEP

ATTACHMENT 1
INTERMUNICIPAL YARD WASTE COMPOSTING SURVEY RESULTS

Categories		MUNICIPALITIES				
		Allen Township	Bushkill Township	East Allen Township	Lehigh Township	Moore Township
1	Contact Information	Ilene M. Eckhart Manager 4714 Indian Trail Road Northampton, PA 18067 (610) 262-7012	Aaron J. Hook Secretary/Treasurer 1114 Bushkill Center Road Nazareth, PA 18064-9557 (610) 759-1250	Annette Wean 5344 Nor-Bath Boulevard Northampton, PA 18067 (610) 262-7961	Rich Demko 3808 Cinnamon Drive Danielsville, PA 18038 (610) 767-4776	Rodney Jarinko 2491 Community Drive Bath, PA 18014 (610) 759-9449
2	Population (2000 Census)	2,630	6,982	4,903	9,728	8,673
3	Housing Units	No response	2,172 Single Family 137 2-4 Unit Buildings 24 Apartment Buildings	No response	3,816 housing units	3,464 Single Family
4	Curb collection of yard waste	No	No	No	Yes	No
5	Management of yard waste	Accepts brush at a drop-off site	No	Accept brush up to 8" in diameter to be chipped	No response	No
6	Awareness of Act 101 recycling provision	Yes	No	Yes	Yes	No
7	Interest in intermunicipal composting program	Yes	Yes	Yes	No*	Yes
8	Willingness to share labor at a composting site	Yes	No answer	Yes	Yes	Yes
9	Willingness to share cost	Yes	Yes	Yes	Yes	Yes
10	Willingness to enter into an agreement	Yes	No answer	Yes	Yes	Yes
11	Current collection method	Drop-off only	N/A	Drop-off only	Loose	N/A
12	Materials collected	Brush	N/A	Brush	Leaves	N/A
13	Location where materials are being managed	Allen Township Municipal Building	N/A	Bicentennial Park	CM Enterprises, Municipal Rd., Walnutport	N/A
14	Operator of site	Allen Township Public Works	N/A	Township road crewmen	Owner	N/A
15	Cost to manage material	Unknown	N/A	\$150/cu.yd.	\$1,000-2,000/year	N/A
16	Availability of collection/management data	No	N/A	No	No	N/A
17	How finished compost is used	Available to residents Used on public property	N/A	Available to residents Used on public property Given to other municipalities	Sold to residents/business Small amount placed on farm fields	N/A
18	Preferred collection method	Bagged Drop-off	Drop-off	Loose Drop-off	No response—already collecting	Loose Not sure

ATTACHMENT 1 - CONTINUED
INTERMUNICIPAL YARD WASTE COMPOSTING SURVEY RESULTS

Categories		MUNICIPALITIES				
		Allen Township	Bushkill Township	East Allen Township	Lehigh Township	Moore Township
19	Preference for grass clippings	No	Yes	Possibly	Yes	Yes
20	Site availability—composting or staging area	Yes--composting Off Rt. 329 near Quarry Owner: Frank Horwith Size: 92.6 acres Not adjacent to residences, schools, or businesses	N/A	Possible--composting Weaversville Rd. (Old Dairy Complex) Owner: East Allen Twp. Size: 12.23 acres Not adjacent to residences, schools or businesses No stream on or near site Condition: Property needs remediation; if no agreement is reached with the state, property could be turned back to state	Yes—staging Municipal Road behind Township Building Owner: Lehigh Township Size: 2-3 acres Residence in front; proposed area is approximately 1,000' to the rear	No response
21	Preferred distribution of finished compost	Available to residents Sold to residents/business Used on public property	Sold to residents/business	Available to residents Used on public property	Available to residents Sold to residents/business Used on public property	Available to residents Sold to residents/business Used on public property
22	Comments				Township is willing to help/cooperate however it is able*	

*It appears from responses that the Township is interested in an intermunicipal effort based on comment and responses to other questions, even though specific response to this question is No.