

RECYCLING TECHNICAL ASSISTANCE
Project #563

LOWER PAXTON TOWNSHIP
DAUPHIN COUNTY, PENNSYLVANIA

CONWAY ROAD COMPOST FACILITY EVALUATION



April 2015

**Sponsored by the Pennsylvania Department of Environmental Protection through the
Pennsylvania State Association of Township Supervisors**

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Project Completed By:



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1.0 STATEMENT OF PROBLEM

This municipal curbside recycling study was conducted for Lower Paxton Township (Township), Dauphin County, Pennsylvania, under the Recycling Technical Assistance program. The program is sponsored by the Pennsylvania Department of Environmental Protection (PADEP) through the Pennsylvania State Association of Township Supervisors (PSATS). Lower Paxton Township operates a comprehensive recovery and composting program for leaf wastes. The rate of incoming organic material has exceeded outgoing compost products. This has resulted in operational challenges and an accumulation of processed organics that do not generate revenue. The Township requested technical assistance to evaluate the compost operation with prioritization on economic sustainability and identification of outlets and markets for compost products.

2.0 SUMMARY OF WORK

2.2 Existing Leaf Waste Collection and Conway Road Compost Operation

In accordance with the Municipal Waste Planning, Recycling and Waste Reduction Act of July 1988 (Act 101), the Township is required to offer a curbside recycling program including the collection of leaf wastes. Additionally, truckloads of leaf waste are prohibited from landfill disposal and must be composted. To meet Act 101 requirements, bagged leaf waste is collected 19 weeks per year as part of the Township's curbside waste collection contract with Waste Management, Inc. The Public Works Department also collects leaves from November 1st through the week before Christmas using leaf box trucks and self-contained leaf collection trucks. A crew of 27 employees vacuum leaves 3 to 4 times from four Township quadrants. The leaf waste vacuum program budget was approximately \$204,000 in 2014. Lower Paxton Township hauled 96, 30-yard roll-off containers of yard waste from West Hanover Township to the compost facility in 2014. Lower Paxton processes this material for West Hanover Township and material is available to the Township as needed.

Collected organics are delivered to, and processed at, the Township's compost facility located on Conway Road. Residents who purchase a permit may deliver leaf waste including brush to the facility. An attendant is onsite from 7:30 a.m. to 5:00 p.m. during normal operating days when the facility is open to the public. The Township recently purchased compost turning and screening equipment to improve processing efficiency and material quality. As of December 2014, it is estimated there is approximately 17,000 cubic yards of organic material on site. The distribution and quantity of organic material piles as of December 2014 is presented on the aerial map and legend in **Appendix A**. Approximate quantities of various on-site organics that have accumulated on site are presented in **Table 1**.

Finished Compost	2,000 Cubic yards
Single-grind Mulch (<1 year old)	900 Cubic Yards
Single-grind Mulch (>1 year old)	7,000 Cubic Yards
Unprocessed leaves, woody waste, and mixed yard waste	6,700 Cubic Yards

2.2.1 Compost Facility Site Visit

Gannett Fleming conducted a site visit of the compost facility on December 19, 2014. Site visit photos are included in **Appendix B**. Generally, the compost site is in good condition. There was very minor water ponding and the feed stocks and processed material contained very little contamination from unwanted materials (e.g. plastics and other non-organics). There are numerous piles of feed stocks (e.g. leaves, mixed yard waste, and woody waste) and piles of mulch or compost at different stages of the composting process on site. These piles require relocation and/or additional screening. Based on discussions regarding proposed site improvements, new compost equipment, and the site expansion, the proposed site modifications and operational changes should improve processing efficiency and the quality of finished compost products.

2.2.1 Organics Management Costs

Residents pay \$57 per month for curbside solid waste and recycling services. Waste Management estimates the cost for bagged leaf waste collection services offered 19 weeks per year costs \$.75 to \$1.00 per month. Assuming 20,085 occupied households (US Census Bureau, 2010) and \$1.00 per month per household, the annual cost for Waste Management bagged leaf collection is approximately \$240,000. This cost is paid by residents via the trash bill. Leaf waste vacuum service provided by the Public Works Department costs approximately \$200,000 per year. West Hanover Township pays approximately \$16,000 annually to Lower Paxton Township for material processing. West Hanover delivers 96 roll-off containers (30 cubic yards each) of yard waste to the compost facility each year.

The Public Works Department does not have a formal annual operations budget specifically for the compost facility. Actual compost operations costs are not tracked in great detail but are generally known. The annual labor budget for compost facility attendants is approximately \$12,000. In 2013, the compost facility generated \$40,430 in revenue via sales of residential and commercial compost facility permits and day passes. Of this total, \$32,800 was generated by issuance of 938 residential annual permits. In 2014 compost permit sales totaled approximately \$35,000. The compost facility does not generate revenue from sale of compost products, tipping fees, or via any other fee structure. Historically, a substantial portion of eligible costs for compost equipment have been offset through Act 101, Section 902 Recycling Grants.

2.2.1 Organics Markets

Gannett Fleming identified eleven (11) organics product outlets in Harrisburg and surrounding area. These trucking and landscaping companies were contacted via phone between December 2014 and January 2015 to determine if they were interested in purchasing bulk quantities of mulch staged at the Conway Road Compost Facility (See **Appendix C**, Compost Products Outlets). The three (3) companies listed below expressed interest in purchasing truckloads of organics from the Township. Due to the holidays and winter timeframe, many of the companies were not available to discuss. The following companies requested a site visit to see the material.

- Two Particular Acres, Royersford, Pennsylvania
- Yingst Trucking, Harrisburg, Pennsylvania
- Blue Mountain Processors, Inc., Elliottsburg, Pennsylvania

2.3 Summary of Findings

Key findings include:

- The Publics Works Department leaf waste vacuum service is a massive and fairly well-coordinated effort involving as many as 27 workers at an annual cost of approximately \$200,000. Due to the high-demand for labor resources during leaf collection season (November 1st through late December), labor availability is extremely limited for other important municipal tasks and projects.
- The labor usage and collection operation using dump trucks fitted with pull-behind leaf boxes is far less efficient when compared to the high capacity self-contained truck mounted leaf vacuum trucks like those already being used by the Township (See photo).
- Township compost permit sales to residents and commercial customers generate approximately \$40,000 annually. Over 90 percent of compost permits sales are residential sales. Less than 10 percent are annual commercial permits and daily commercial passes. Permit sales is the compost facility's only source of revenue generation. The compost facility does not generate revenue through tip fees, compost products, or other means. This is atypical of a municipal compost facility of this scale and increases risk of economic sustainability and long term operation of the compost facility.
- The Township does not conduct full-cost accounting or detailed budgeting of the compost facility. A compost budget or budget line item to track labor, fuel, maintenance and other compost operational costs is not in place. The leaf waste program is operated separately from the compost program and costs are not tracked in detail. The organics program operation and costs are not fully integrated with the rest of the solid waste system, including the curbside collection of municipal solid waste. Full cost accounting and integration with the entire solid waste program is important for budgeting and labor allocation, particularly at this operating scale.
- Based on conversations with composting experts, the Penn State University Agricultural Analytic Services, and area compost markets including Davis Landscape, LTD and Zeager Bros., Inc., the market conditions for mulch and compost are very good provided the quality of the organic products is high. In the Harrisburg area there is an increasing demand for black mulch at a sale value of \$17.00 to \$20.00 per cubic yard. There are markets in the Harrisburg area interested in the mulch and compost that is currently on site and demand for these organics will increase in the spring.
- The "Daily Compost Facility Use" reports that are kept by the compost facility tenants to tally the number of residents dropping off and picking up material are not clear. It is difficult to determine how many vehicles arrived to drop off and pick up material and no information is collected on the vehicle type, capacity or volume (quantity), and type of material delivered or loaded.
- The Conway Road Compost facility is not operated similar to other financially successful composting facilities in Pennsylvania where multiple streams of revenue offset costs. these revenue streams include:
 - Incoming material tip fees.



- Outgoing product sales for mulch, compost, wood chips, soil blends, etc.
- Customer Permits or user fees.
- Contractual arrangements (like the one with West Hanover Township) with one or more municipalities that share the use of the compost facility. This usage fee can be based on a per capita formula.
- General fund (taxes).
- Compost equipment rental and/or maintenance agreements.
- Act 101, Section 902 Grants (not true revenue).
- The Township does not have a point of sales (POS) system established at the compost facility to charge or invoice customers for incoming or outgoing materials.
- Based on the preliminary site visit, no major operation or material processing issues were identified at the Conway Road Compost Facility. Minor issues included a minimal amount of water ponding and accumulation of mulch and compost piles across the site that restrict operational flow in a few areas, and a few organic piles are located within the permit buffer area. These issues are being addressed as part of ongoing site modifications and preparations to improve compost operations.
- Although the incoming feed stocks are very clean in terms of the amount of unwanted debris, much of the mulch is over 2 years old. Aging mulch breaks down and becomes a combination of mulch, compost, and fines. Aging mulch is problematic since it is not as attractive to markets, generates less revenue per ton, and/or may require additional screening and cost to remove fines and vegetation. Even if aging mulch is used on Public Works projects, the additional handling adds costs and uses valuable labor resources.
- The Township's website provides information to the public regarding delivering organics to the compost facility but does not emphasize the value of compost products and does not clarify the availability of materials to residents and commercial customers.
- Material marketing and revenue generation are key concerns regarding the long term economic feasibility of the Conway Road Compost Facility. If the compost facility continues to hold organics longer than 14 months, the compost facility will continue to experience avoidable operational and financial challenges.

3.0 SOLUTIONS

3.1 Recommended Solutions

In 2015, it is recommended the Township develop a 5-year Plan for the Conway Road Compost Facility. The focus of this planning process and resulting Organics Management Plan (OMP) should be the development and implementation of strategies to improve the overall economic sustainability of the organics program and the Conway Road Compost Facility. The timing of this plan aligns with the submittal of a compost permit (WMGR025), site expansion, and the recent procurement of new composting equipment including a windrow turner and trommel screen. Although recycling grants have been instrumental in reducing the capital expenses for compost processing equipment including the windrow turner and horizontal grinder, grants are not guaranteed. The 5-year OMP should identify the actions required to transition the facility to operate as a composting business that is not reliant on grants and not heavily subsidized through the General Fund. A vision of the OMP could include the cost effective operation of the Compost Facility so that it is available to serve the Lower Paxton Township community for years to come. This Plan will need to address the following items:

- On-site organics management

- PADEP permit WMGR025
- Full-cost accounting
- Revenue generation
- Community education
- Compost quality
- Compost markets
- Leaf waste vacuum service

On-site Organics Management: An initial priority is to reduce the quantity of mulch, and to a lesser extent compost, on site to improve operating conditions and begin the process of effective material marketing and end use. Generally, the Compost Facility should be operated so that all incoming organics are received, processed, and moved offsite within a 12-14 month period. Based on preliminary investigations, the highest and best use for the accumulated organics includes:

- Selling at least 60 percent of the single-ground mulch that is less than 2 years old in bulk without additional processing to expedite removal to promote site reorganization and efficient use of the site.
- If market will purchase, sell single-ground mulch in bulk that is over 2 years old to obtain revenue.
- Screen mulch that is over two years old into high quality mulch and compost.
 - Screened mulch should be sold in bulk to local and regional markets including landscaping companies at a price consistent with local prices. Use mulch on Township Public Works projects.
 - Screened compost that results from the mulch screening should be mixed with other finished compost on site and sold in bulk or used on Township Public Works projects including construction, street repairs, and athletic fields.
 - It is not recommended that all compost on site is sold in bulk. This will ensure that compost remains available to the Township, residents, and spot commercial customers that visit the compost facility.

It is recommended the Township contact and schedule site visits from the companies listed on Page 2 who expressed interest in the Township’s material. The Township should also contact the other companies identified in **Appendix C** to verify their current or future interest in the Township’s organics. Site visits with market prospects should be used to verify pricing and arrangements for removing bulk quantities of mulch as soon as feasible. Yingst Trucking met with Gannett Fleming and the Public Works Director on February 19th and reviewed the mulch products. Yingst Trucking indicated they were interested in the material and requested laboratory data.

PADEP permit WMGR025: The Township should finish preparing and submit permit WMGR025 that authorizes the composting and beneficial reuse of source-separated wastes: agricultural waste other than mortalities, butcher wastes other than whole carcass, food processing waste, pre-consumer and post-consumer food residuals, yard waste, land clearing and grubbing material untreated wood waste, gypsum wallboard, paper, cardboard, waxed cardboard, virgin paper mill sludge and spent mushroom substrate. This general permit will allow the compost facility permit boundary to increase from 5 acres to 15 acres. The additional permitted area will benefit operations, particularly the ability to construct very long, parallel windrows of leaf waste and mixed yard wastes that can be turned using the self-propelled windrow turner and combined after initial size reduction. Although other feed stocks are permitted under WMGR025, it is not recommended the Township consider accepting new types of source-separated organics such as food wastes at this

time. Organics like food waste require special handling, including an impervious pad. Feed stocks will need to be addressed clearly in the permit and reviewed early in the process with PADEP to avoid or minimize permit issues. The Township should carefully consider the general permit requirements related to issuing certified letters to land owners to invite public comment. If adjacent landowners reject the proposed site expansion, it could prevent permit approval.

Full-cost Accounting: The Township should begin tracking the operational costs of the compost facility in detail. Compost facility costs should be tracked and analyzed in the context of the entire solid waste system. The entire solid waste system begins at collection and includes the leaf vacuum service and the residential curbside collection contract for solid wastes, recyclables, and bagged leaf waste. Understanding operational cost details will facilitate in the long-term budgeting, planning, and operation of the compost facility. Full-cost accounting is particularly important for the Conway Road Compost Facility due to its scale. The corresponding capital costs, labor costs, and revenue generation are expected to increase as the facility expands and changes operating procedures. The Township should improve its understanding of the cost, revenue, and operational relationships between the following program components:

- The contract with Waste Management, Inc. for curbside solid waste, recyclables, and bagged leaf waste collection and disposal
- Public Works Leaf Vacuum Service
- Compost facility operation

The Township should begin to track the following costs for the compost facility:

- Labor (salaries and benefits)
- Fuel
- Equipment capital costs (use straight line depreciation)
- Equipment replacement costs (the difference in expected replacement cost minus the original cost). Money should be set aside for repairs and replacement for grant funded equipment.
- Annual equipment maintenance costs.

Revenue Generation: The Township should diversify and increase its compost facility revenue generation beyond residential and commercial permit fees with the target to fully offset capital and operation costs in 5-years. This improved economic model will include providing excellent quality material and assure long term access by the community to organics and a very fair price. It is recommended the Township generate revenue through a combination of the following:

- Customer permits (residential and commercial).
- Tip fees for incoming materials calculated according to volume (i.e. vehicle capacity) and material type.
- Sale of outgoing compost products. Align pricing with local and regional markets. Sell high quality mulch, compost, and wood chips by volume (per cubic yard) placed into customer vehicles using a front-end loader. It is recommended residents continue to be able to self-load defined quantities of mulch at no cost.
 - To enable customer billing or invoicing for services and compost products, the Township should evaluate methods to receive, track, and bill customers including Point of Sales (POS) systems that accept credit card payment at the facility. The Millfair Compost Facility in Erie Pennsylvania successfully uses Merchant OS Lightspeed Retail (<https://www.lightspeedpos.com/about-lightspeed-pos/>).

- Establish contractual agreements with nearby municipalities to use the compost facility services and products. This may include a usage fee based on per capita, fee schedules for tipping and purchasing materials, and cost-sharing arrangements tied to the use of compost equipment. **Appendix D** includes information regarding the First Regional Compost Facility operating structure and fee schedule.
- The Township should continue to apply for Act 101 Section 902 Recycling grants to offset eligible capital costs, but this should not be considered a true or reliable revenue source.

Community Education: The Township should conduct a comprehensive and sustained public education campaign to clearly communicate the Township’s intentions to transition the compost facility to a sustainable operating structure with increased public benefit. The education campaign should convey that the Township will be improving the quality and availability of compost products and showcase organics use on community projects. The Township should be transparent regarding operating costs and its need to offset a portion of costs to assure long term operations. This public education process should be reinforced by the visible changes including improved compost facility services such as loading trucks with front-end loaders. The Township should develop and distribute a Compost Facility Brochure that describes acceptable and unacceptable materials, hours of operation, permit requirements, tip fee rates, and fee schedule for compost products. Refer to the Millfair Compost Center Brochure (**Appendix E**).

Compost Quality: The Township should implement a formalized commitment regarding the production of high quality compost products. By actively and collaboratively working to improve feedstock quality, the Township will reduce processing and disposal costs and be in the position to maintain end users’ product confidence and maximize product value. The Township should work with all feedstock providers to assure feedstock quality parameters are met. Currently, the feedstock providers include Waste Management, Inc., the Public Works Department (e.g. leaf collection crews), commercial and residential visitors (drop-off), and the general public (e.g. curbside leaves). It is recommended the compost facility operators receive compost training, which could include compost courses provided by the Professional Recyclers of Pennsylvania (PROP).

Compost Markets: It is recommended the Township increase and diversify end uses and markets for compost with a goal to have outgoing market demand for processed organics exceed production so that no material remains on-site over 14 months. Initially, the market emphasis should be on identifying companies to remove bulk loads of organics so that all material over 1 year old as of March 2015 is off site by March 2016 and/or dedicated to specific Public Works projects. The Township should enter short term marketing agreements for a portion of its organics (approximately 30-40 percent of annual volume) each year with regional markets to confirm a portion of organics will be delivered off site in bulk. The Township should establish the current baseline and then increase the use of mulch, compost, woodchips, and soil blends on Township projects annually (e.g. construction, landscaping, erosion control, stormwater management, and athletic field and park landscaping and maintenance to reduce pesticide and fertilizer use). The increased use of organics on Township projects promotes water conservation and reduces contaminants from entering stormwater runoff. These projects should be monitored and recorded annually to document organic material use (volume and type), cost avoidance, performance, and environmental benefits.

Leaf Waste Vacuum Service: It is recommended the Township replace its tow-behind leaf vacuum trucks with high capacity truck-mounted leaf waste collection vehicles to increase leaf waste vacuum efficiency, reduce operating costs, improve worker safety, and improve labor resource

utilization and management. To select the appropriate leaf waste equipment, it is recommended the Township compare its current self-contained truck-mounted leaf truck by Pikrite and ODB with the Model SCL800SM ODB self-contained leaf collector (**Appendix F**, ODB self-contained leaf waste specification). Both of these self-contained leaf trucks are very efficient, but they are different in price and function. The specification in **Appendix F** is from State College Borough and includes customization of the SCL800SM to include brush chipping capability. The truck is not fitted for snow plowing. State College purchased an SCL800SM via the State procurement program in 2014 for \$150,000.

APPENDIX

- Appendix A - Compost Site Materials Distribution (Map)**
- Appendix B - Compost Site Photos (12-19-14)**
- Appendix C - Compost Products Outlets**
- Appendix D - First Regional Compost Facility Fee Schedule**
- Appendix E - Millfair Compost Facility Brochure**
- Appendix F - ODB Leaf Vacuum Truck Specification**