

**SWANA RECYCLING
TECHNICAL ASSISTANCE STUDY**

FINAL REPORT

**NETHER PROVIDENCE TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA**

**GUIDANCE FOR IMPROVING RECYCLING RATES AND
CHANGING FROM A PUBLIC TO A PRIVATE
RECYCLABLES COLLECTION SYSTEM**



GANNETT FLEMING, INC.



HARRISBURG, PENNSYLVANIA

DECEMBER 2006

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SWANA RECYCLING TECHNICAL ASSISTANCE STUDY

EXECUTIVE SUMMARY

NETHER PROVIDENCE TOWNSHIP GUIDANCE FOR IMPROVING RECYCLING RATES AND CHANGING FROM A PUBLIC TO A PRIVATE RECYCLABLES COLLECTION SYSTEM

Nether Providence Township (NPT) is in the process of evaluating the current waste and recycling system so that the Township can increase recycling rates and determine if it is feasible to change from public recycling services to private recycling services. As part of this evaluation process, Gannett Fleming (GF) provided technical assistance by evaluating the existing waste and recycling system and several collection system alternatives. It is clear from our analysis that the current curbside recycling program is designed and implemented in a manner that makes it inconvenient for residents to participate, thus significantly limiting the amount of recyclables that are recovered each year. GF encourages the Township to make the structural collection system changes that are recommended in this Study and to transition to a municipal or joint-municipal contract with a single hauler for “bundled” waste and recyclables services. Some of the observations, conclusions, and recommendations from our analysis include the following:

- The existing recycling program is inconvenient and confusing for residents, which is primarily caused by 1) once-per-month collection schedule; 2) the limited number of recyclable materials that residents are permitted to recycle. Only about 20 percent of households set out recyclables on curbside collection days.
- The leaf collection and leaf composting program conducted by the Public Works Department appears to be successful and produces a clean finished compost product.
- The public recyclables drop-off has a very limited footprint and there is insufficient room to expand or to accept other materials (e.g. plastics).
- There are at least three recyclables markets within twenty miles of NPT, thus offering outlets for a comprehensive list of recyclable materials.
- The existing Eager Beaver recycling truck is inefficient when compared with many newer recycling vehicles and is inadequate for an enhanced recycling program.
- NPT housing density, the high number of single-family households, and the wide streets are favorable factors for efficient curbside collection of waste and recyclables. However, the private subscription waste collection service and multiple collection trucks operating in the Township creates inefficient waste collection. Collection system inefficiencies produce higher operational costs, which are passed on to homeowners. The costs for fuel, health care, equipment, and workman’s compensation are escalating and will continue to be passed on to residents with little control unless the waste collection system is changed. GF’s experience and extensive review of case studies across Pennsylvania have clearly shown that single-hauler contract collection systems out-perform nearly all private subscription waste collection systems.

- As soon as feasible, it is recommended the Township implement Alternative 1: Municipal Bid for Bundled Waste and Recycling Services. GF experience has shown that bidding for waste and recycling service (Alternative 1) offers the greatest value to the Township. Bidding for waste and recycling services together can result in an improved level of collection service at a lower total cost (is seen as a lower cost per household) when compared with other collection system alternatives. GF can develop a standard bid document for \$4,000 - \$7,000. However, because contracting for collection services is a significant change, the Township may consider a phased approach for implementing the enhanced collection system. For example, it may be feasible to begin correcting some of the fundamental structural problems with waste and recycling program immediately. As the structure of the collection system program is improved and becomes more defined, the Township could initiate the development of bid documents for securing comprehensive waste and recyclables collection services.
- GF recommends the Township improve the following components of the existing waste and recycling program structure:
 - **Recyclables collection schedule:** Change the curbside recyclables collection schedule to a minimum pick up frequency of once every two-weeks (bi-weekly).
 - **Recyclables containers:** Provide 22-gallon to 32-gallon recyclable containers to all households. These should be labeled with the new list of acceptable recyclables.
 - **Recyclable materials:** Expand the list of recyclables collected from households.
 - **Recyclables collection equipment:** Replace the Eager Beaver collection vehicle with a Labrie Top Select collection vehicle or other high-capacity collection vehicle.
 - **Recycling ordinance:** Revise the current recycling ordinance and consider adding program details in a concise Policies and Procedures (P&P) document.
 - **Waste collection schedule:** Via ordinance, limit the number of days haulers are permitted to collect waste in the Township to two days (specify which days).
 - **Leaf Waste:** To meet Act 101 requirements, expand the curbside collection program for leaves to include the minimum collection frequency for “leaf waste”. Leaf waste includes leaves plus **garden residue, shrubbery and tree trimmings, and similar material** (i.e. brush), but **not including grass clippings**. If residents have a local residential leaf waste drop-off, one curbside collection of leaves in the fall is required and one curbside collection of the remaining leaf waste materials is required in the spring. Once-per-month collection is required for leaf waste if no public or private residential drop-off location is available (i.e. in or near the Township).
- It is recommended the Township continue to submit for Act 101, Section 902 Recycling Grant funds to offset eligible costs for recycling equipment, containers and recycling education. The Township should also submit for Act 101, Section 904 Recycling Grant funds for reimbursement of eligible reported tons for commercial and residential recycling. The Township should pursue revenues from sale of recyclables, including compost, to the extent feasible.

SWANA RECYCLING TECHNICAL ASSISTANCE STUDY

FINAL REPORT

NETHER PROVIDENCE TOWNSHIP GUIDANCE FOR CHANGING FROM A PUBLIC RECYCLABLES COLLECTION SYSTEM TO A PRIVATE RECYCLABLES COLLECTION SYSTEM

1.0 INTRODUCTION

Through the partnership with the Solid Waste Association of North America (SWANA), the Pennsylvania State Association of Township Supervisors, and the Pennsylvania Department of Environmental Protection (PADEP), Nether Providence Township (NPT or Township) was awarded \$7,500 in technical assistance that was provided by Gannett Fleming, Inc. (GF). Under this project, GF worked with the Township to develop and complete the following tasks:

1.1 Scope of Work

GF worked with NPT to develop the following tasks for this project.

- Task #1** Gather and review background information provided by NPT related to existing waste, recyclables and yard waste collection practices. This will include review of the existing ordinance(s).
- Task #2** GF will describe and evaluate the curbside recyclables collection program provided by the Township Public Works Department. GF will describe and recommend one or more collection system alternatives that will help the Township improve the overall performance of the recyclables collection system.
- Task #3** GF will prepare and provide the Township with a summary report of findings and recommendations. This task includes a review of the report by the Pennsylvania Department of Environmental Protection (PADEP) and response to PADEP comments. Additionally, an electronic file of the final report will be submitted to PADEP of the project conclusions and findings. Both an electronic and hardcopy version of the report will be provided to the Township.

2.0 BACKGROUND

NPT is a suburban community located within commuting distance of Philadelphia. The Township is in central Delaware County, Pennsylvania. There are approximately 13,500 residents in the Township and the Township is growing. NPT population is projected by the Delaware Valley Regional Planning Commission to reach 14,020 by year 2015. The Township area is just under five square miles and the housing density is high. There are a variety of housing types, shops, businesses and industries, and a substantial number of owner-occupied housing units. Approximately 90 percent of the housing units are owner-occupied, single family households.

Nether Providence Township wishes to increase its recycling rate. As part of this effort, the Township understands that developing a more convenient recycling program than the one currently provided to residents by the Township will be essential. The NPT Board of Commissioners appointed a Recycling Task Force to assess current recycling efforts, identify improvements, and consider alternatives. The goals and objectives of the NPT Recycling Task Force include:

- ✓ **Increasing recycling rates**
- ✓ **Enhancing curbside pick-up**
- ✓ **Improving convenience for residents**
- ✓ **Evaluating privatization of recycling services**
- ✓ **Evaluating bundling of curbside recycling and trash collection services**

3.0 EXISTING WASTE COLLECTION SYSTEM

Nether Providence Township has a “private subscription” waste collection system where homeowners independently contract with one of a number of local private waste companies. On average, residents pay between \$45 and \$60 per quarter for weekly curbside waste collection services. Some of the private hauling companies that operate in the area include:

- **Waste Management**
- **Opdenaker Trash Removal Services**
- **McCusker & Ogborn**

The Township Public Works Department provides “large trash pick-up” services for bulky items (e.g. furniture, white goods, and miscellaneous oversized items). The Township does not collect freon-containing appliances such as refrigerators.

After municipal waste is collected in the Township, the majority is taken to one of the following disposal facilities:

- **Rolling Hills Landfill** (operated by Delaware County Solid Waste Authority)
- **Two transfer facilities** (operated by the Delaware County Solid Waste Authority)
- **Delaware County Resource Recovery Facility** (operated by Covanta Energy)

There are other transfer facilities in Delaware County used for waste disposal. Importantly, there are **no tip fees charged for municipal waste** generated by municipalities within Delaware County when it is delivered to the facilities listed above. The cost of waste disposal is included with municipal tax that is paid by County citizens. There is a tip fee assessed by the Delaware County Solid Waste Authority for waste generated by commercial establishments and delivered to these facilities by commercial haulers.

4.0 EXISTING PUBLIC RECYCLABLES COLLECTION SYSTEM

Nether Providence Township is mandated to provide curbside recycling to its residents by the Pennsylvania Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101). Act 101 stipulates the responsibilities of municipalities for establishing residential, curbside

recycling programs. Act 101 does not require the Township to provide the curbside collection of waste for its residents, which in the Township is provided by several private haulers. PADEP recognizes three basic systems that municipalities can use to provide curbside collection of recyclables:

- Collection of recyclables by the municipality and municipal workers, which is the current collection system.
- Collection of recyclables by one private collection company (in some cases more than one company) under a sole contract with the municipality.
- Collection of recyclables by any number of private collection companies under private subscription with residents.

The Township’s Public Works Department conducts once-per-month curbside collection of:

- Aluminum cans
- Steel/bi-metallic cans
- Clear glass

The Township estimates that 20 percent of households have curbside set-outs of recyclables on the monthly collection days. The collection service is conducted using a 20-cubic-yard Eager Beaver compartmentalized truck (see **Appendix A, Photo 4**). The Township is in the process of replacing the older Eager Beaver with a newer version of the same collection vehicle. A Public Works staff of two employees operates the Eager Beaver during collection days. Seven collection days per month are needed to collect from the seven Township wards. The truck is emptied at the end of each collection day. The Township does not charge any fees to residents for curbside recycling services. The 2005 curbside and drop-off center collection totals are presented in Table 1 below:

Table 1: Nether Providence Township: 2005 Recycling Totals

| Recyclable Material | Curbside Total (tons) | Drop-off Total (tons) | Total Combined Recyclables (tons) |
|---|-----------------------|-----------------------|-----------------------------------|
| Clear Glass | 22.39 | 29.82 | 51.59 |
| Aluminum Cans* | - | - | 8.08 |
| Bi-metallic* | - | - | 10.05 |
| 2005 Total tons of all curbside and drop-off recyclables | | | 70.71 |

*Aluminum can and bi-metallic can totals were not segregated by origin (i.e. drop-off or curbside)

4.1 Recyclables Drop-off Locations

The Township operates a low-tech, unstaffed recyclables drop-off site near the corner of Providence Road and Brookhaven Road, which is also the location of the Public Works maintenance building. The recycling center is open to residents:

- Monday and Tuesday:** 7:00 a.m. – 3:30 p.m.
- Wednesday:** 7:00 a.m. - 9:00 p.m. or dusk
- Thursday and Friday:** 7:00 a.m. – 3:30 p.m.
- Saturday:** 9:00 a.m. – 1:00 p.m.

The drop-off area for recyclables is covered by a pole building (refer to **Appendix A, Photos 5 and 6.**) There is no charge to use the drop-off recycling center. Residents drop-off the following segregated recyclables in concrete dividers:

- Newspaper
- Magazines
- High-grade office paper
- Corrugated cardboard
- Paperboard
- Clear glass
- Green glass
- Brown glass
- Aluminum cans
- Bi-metal cans

Plastics are not collected by the curbside or drop-off programs because the local recycling market used by the Township is not equipped to accept this material. McCusker and Ogborn has a drop-off located less than 10 miles from the Township that accepts fiber materials and commingled or separated container recyclables. NPT uses McCusker and Ogborn as an outlet for some of the recyclables collected in the Township. McCusker and Ogborn also allows residents to drop-off recyclables directly at their facilities.

4.2 Commercial, Municipal and Institutional Establishment Recycling

An undetermined number of commercial establishments privately subscribe for the collection of recyclable materials. At a minimum, Act 101 requires **commercial, municipal and institutional establishments** to separate the following from municipal waste:

- **Aluminum Cans**
- **High grade office paper**
- **Corrugated paper**
- **Leaf waste**

Additionally, the Nether Township Recycling Code requires these establishments to recycle bi-metallic cans and clear glass.

4.3 Recyclables Markets

The Township’s primary recyclables market for materials collected curbside is Accurate Recycling Corporation (Accurate) located in Lansdowne, Pennsylvania. Accurate is approximately seven miles from the Township. Accurate is a recyclables processing facility that currently accepts the following materials from Nether Providence Township:

- Aluminum cans
- Bi-metal cans
- Mixed paper (e.g. newspaper, junk mail, cardboard, boxboard)

Aluminum and steel/bi-metal cans may be delivered to Accurate Recycling separated or mixed because the facility has an aluminum and steel/bi-metal separator. The facility is not equipped to separate or process plastics at this time. Accurate is investigating the feasibility of adding equipment to process plastics and if the analysis proves economically viable, the facility may add plastic recycling in the next few years. GF contacted Accurate Recycling in December of 2006 to

discuss market conditions and prices. The price paid to municipalities for delivered recyclables as provided by Accurate were as follows:

- Aluminum cans - \$1,200 per ton (\$.60 per lb.)
- Steel/bi-metallic - \$20 per ton
- Aluminum cans and steel/bi-metallic cans mixed - \$60 per ton

The other local recyclables markets that do, or may serve as outlets for recyclables generated and collected in the Township include:

- **Waste Management**
408 South Oak Ave.
Primos, PA 19018
610-626-7500
- **McCusker and Ogborn**
10 Reany Street
Chester, PA 19013
610-521-1669

5.0 EXISTING LEAF WASTE COLLECTION AND COMPOSTING PROGRAM

Leaves are collected from mid-October into December using six self-contained leaf waste vacuum trucks by ODB (see **Appendix A, Photo 1**). Residents rake leaves to the curbside for pick-up. Leaf vacuum service takes 2.5 to 3 months to complete using approximately 10 public works staff per day (5 days per week). After December, and year round, residents can call the Public Works Department to schedule curbside collection of bagged leaves.

Leaves are taken to a leaf waste composting site that is shared by Nether Providence Township and Swarthmore Borough (see **Appendix A, Photo 2**). The site is paved and is owned by Swarthmore College. A yellow line separates the working areas of the site to ensure that operations are kept separate. Leaves collected in the Township are placed in windrows that are approximately 250' long and 6'-8' high. The piles are turned twice per week using a Scarab windrow (**Appendix A, Photo 3**) turner and become finished compost in 3-5 months. The photos were taken during a site visit conducted in October 2006, after one week of collected leaves had been delivered to the site.

A compost take away area is set-up at the entrance of the leaf waste compost site. Residents may take material from this location free of charge. The Township also sells loads of finished leaf compost at the Township building at prices of \$35 per 3 cubic yards and \$70 per 6 cubic yards (truckload). The Township generated \$17,330 in 2005 from sale of finished compost. These revenues do not fully offset costs of the collection program, which uses six leaf vacuum trucks and approximately 10 staff members each day during the fall collection period.

5.1 Act 101 Requirements for Leaf waste

Leaf waste is defined by Act 101, to include leaves, garden residue, shrubbery and tree trimmings, and similar material (i.e. brush), but not including grass clippings. In mandated municipalities that offer a supplemental residential leaf waste drop-off location, Act 101 and PADEP policies and guidelines require the following for collection of leaf waste:

1. **Prohibit the burning of recycled materials** collected within the municipality, **including leaf waste** (typically done via a separate anti-burning ordinance).
2. **A minimum of two curbside collections should be conducted annually.**
 - At least one spring collection is recommended by PADEP for garden residue, shrubbery, tree trimmings (or "brush"), and similar material, not including grass clippings.
 - At least one fall collection of leaves.

If a mandated municipality does not offer a residential drop-off location for leaf waste, the municipality is required to provide curbside leaf waste collection at least once-per-month.

6.0 WASTE AND RECYCLING COLLECTION SYSTEM EVALUATION

This section provides a brief evaluation of NPT’s waste collection and recycling program. The evaluation is based on information provided by the Township, GF’s site visit conducted in October 2006, local recycling markets, and is based on GF’s experience with municipal recycling programs throughout Pennsylvania. Some key observations and findings include:

- The Township’s housing density, high number of single-family households, and wide streets are very favorable factors for efficient curbside collection of waste and recyclables.
- Based on GF’s preliminary review, the Township Public Work Department provides a comprehensive leaf vacuum service and operates a successful compost site that is shared with Swarthmore Borough.
- Collection of leaves (only) does not meet minimum curbside collection requirements established by Act 101 of 1988 and PADEP’s minimum standards. To be in full compliance with Act 101 for curbside collection of “leaf waste”, PADEP recommends:
 - at least one fall collection for leaves (which is done and exceeded currently by the Township);
 - plus at least one curbside collection of garden residue, shrubbery and tree trimmings, and similar material (i.e. brush), but not including grass clippings);
 - and a supplemental drop-off site for leaf waste in or near the Township.

If no supplemental residential drop-off site for leaf waste is available, Act 101 requires once-per-month curbside collection of leaf waste.

- The Township has private subscription waste collection services. At least three different hauling companies provide waste collection service to residential households on different days. Duplication of waste collection routes and sporadic or non-consecutive collection of households increases the number of collection trucks needed and increases the overall costs of waste collection (including recycling). These unnecessary added costs are passed on to residents and are inflating at an unchecked rate. The Township should closely evaluate municipal bidding to secure a single contracted waste hauler as a way to ‘manage competition’ and to provide more comprehensive waste and recycling services to all households at a more competitive price. This should be a future goal of the Township, with realization that the existing recycling program may need to be improved before this larger step can be taken.

More immediately, it is recommended the Township revise the Township ordinance to limit the number of days haulers are permitted to provide collection services.

- **Once-per-month recyclables collection is very inconvenient** for residents. Once-per-month recyclables collection creates the following problems:
 - Residents have to store bulky, sometimes odorous recyclables for an extended period of time. Due to the hassle, many residents will simply discard recyclables with trash. Approximately 20 percent of households set-out recyclables on collection days.
 - Residents can often forget the recyclables collection day. Missing one collection requires a household to store recyclables for two months. The recyclables collection schedule complicates recyclables education and due to the inconvenience, actually trains residents that disposal (of recyclables) is much easier than recycling.
 - The Township’s 20-gallon recycling containers do not have the capacity to collect/store recyclables generated in households for a period of one month.
- The existing curbside recycling program does not include collection of colored glass, plastics, and paper, which are significant components of the residential waste stream. Collecting a limited number of recyclables can be confusing to residents who realize that some items (e.g. plastic bottles) are being disposed but could be recycled. In addition, because these materials are not being captured, the total potential tons of material that could be collected is decreased. Fewer reported tons reduce the amount of recyclable material that is eligible for reimbursement by the Act 101, Section 904 Recycling Grant program.
- An enhanced recycling program will require increased recyclables collection frequency at a minimum of once every two weeks. An enhanced recycling program could increase household participation from 20 percent to over 75 percent, thus dramatically increasing the amount of recyclables that will require collection and processing.

- The current recyclables collection vehicle is a 20-cubic-yard Eager Beaver. This recycling vehicle is not recommended for future use by the Township in an enhanced recycling program. The Township's ability to implement and maintain an enhanced and flexible recycling program, where the Public Works Department provides collection service, will be highly dependent on the procurement of the proper recycling equipment. Use of an Eager Beaver recycling truck or similar type of compartmentalized recyclables vehicle will negatively impact the Township's ability to efficiently provide recyclables collection service and could interfere with other long-term goals for an improved Township-wide waste collection system. GF has analyzed newer recycling equipment in the Recycling Study and identified more suitable equipment.
- The public recyclables drop-off site located at the Public Works Yard is adequate for the current level of participation and material types. However, this **drop-off site area does not have a sufficient footprint to handle an increase of materials or to add new materials**. For example, adding plastics could significantly hinder the ability to manage this drop-off site.
- The primary recyclables market for recyclables collected curbside is Accurate Recycling Corporation in Lansdowne, Pennsylvania. Accurate is not currently equipped to accept plastics, but is considering adding this commodity in two to three years. Waste Management and McCusker and Ogborn are local markets that can accept various paper grades and commingled recyclables. These markets may be essential to minimizing costs associated with implementing a new curbside recycling program. If plastics are added to the list of acceptable recyclables, Accurate may no longer be the primary recyclables market of curbside collected materials.

7.0 EQUIPMENT EVALUATION AND COMPARISON

As part of the recycling study, GF evaluated several pieces of recyclables collection equipment for comparison with the Township's current recyclables collection vehicle: the *Eager Beaver*. Identifying and selecting the appropriate truck size and type will be a critical component for successful implementation of an enhanced curbside recycling program.

As discussed in earlier sections of this report, the Eager Beaver currently collects aluminum cans, bi-metallic cans, and clear glass on a once-per-month collection schedule. It is fully expected that an enhanced recycling program, with increased collection frequency and possibly additional materials, can dramatically increase the total quantity of recyclables recovered by the Township. GF believes the Eager Beaver and other similar compartmentalized recyclables collection vehicles are inefficient and will not satisfy the Township's collection needs when a new recycling program is implemented. Small capacity, compartmentalized collection vehicles without compaction capability and other needed options will result in higher operational costs when compared to other available equipment. Less than optimal equipment could increase the difficulty in implementing a new recycling program and lead to increased costs (primarily due to increased labor expenses).

The type of recyclable collection vehicle used by the Township will impact the following:

- Collection efficiency
- Staff utilization
- Ability/flexibility of the Township to adjust to recyclable market changes
- Total collection system costs and program implementability

GF reviewed recyclables collection vehicles from the companies listed below:

- Eager Beaver (current NPT recycling vehicle)
- Labrie Environmental Group
- Heil Environmental Industries, LTD.
- Peterbilt

For this analysis, GF has only compared the *Labrie Top Select Model* with the *Eager Beaver*. However, Heil Environmental Industries, Peterbilt and others are manufacturers offering a variety of recyclable collection vehicles. Specifications for two curbside collection vehicles are included in **Appendix B**. Based on local recyclables markets, the recyclables collection vehicles should be able to collect both **fiber** (i.e. mixed paper) and **commingled materials** (i.e. plastic, glass, aluminum, bi-metallic cans) separately during the collection route. In other words, some type of split collection vehicle is recommended to maximize collection efficiency and to segregate materials. Both the Top Select and Eager Beaver are used for residential curbside recycling, although the Top Select vehicle can also be used for commercial applications.

Vehicle features for the Labrie Top Select and Eager Beaver are shown below:

7.1 Labrie Top Select

- Offers a low-entry cab conversion with a curbside driving station
- Minimum of one-man operation
- 35, 42, 44, or 48 cubic yard capacity
- Side loading capacity
 - Single bucket system
 - Dual bucket system
 - Allows for collection from both sides of the street
 - Hopper on the side can hold approximately one to two yards
 - Depending on participation percentage and mix percentage, can service approximately 5 – 20 houses before cycling
- Split load capacity
 - Two to seven compartments
- Automatically adjustable compartments
 - Six-inch increments to account for different volumes of material
- Wider loading buckets and auto-lock attachments for carts
 - Used in commercial areas
- Designed to minimize stress on loader

It is noted that the 2007 New Emission Standards may impact the design of this vehicle (i.e. may change cab design thus preventing a one-man operation).

The following Pennsylvania Municipalities use and are satisfied with the Labrie Top Select:

- Conshohocken Borough
- Lewistown Borough
- Centre County

To better understand the effectiveness of the Labrie Top Select, GF reviewed the Borough of Conshohocken’s recyclables collection data. The Borough services 3,300 households and 60 small businesses using the Labrie Top Select. The small businesses are provided the same recyclables collection service as households. At the curb, residents separate **commingled** materials (i.e. plastics, aluminum, steel and bi-metallic cans, and glass) and **mixed paper** including newspaper, magazines, junk mail, and cardboard. The Borough uses one driver and two pickers. Both sides of the street are collected simultaneously on service routes. Based on the information provided from Conshohocken Borough, the vehicle collects an average 340 pounds of combined materials (paper and commingled) annually from each household, which totaled 575 tons in 2005. The Borough provides service on Monday and Friday. On average, two trips are made per day to the local recycling facility. Annually, the Borough makes 207 trips to the local recycling facility. The Borough services approximately 1,500 households on collection days. Data from Conshohocken’s collection program is presented in the table below.

| Conshohocken Borough (average recyclables tons for 2005 and 2006) | | | |
|--|--------------|-------------------|-----------------|
| Labrie Top Select | Paper | Commingled | Combined |
| Averaged Annual Tons Collected | 254.41 | 320.95 | 575.36 |
| Total Number Completed Loads (equivalent to number of trips to recycling center) | | | 207 |
| Total Averaged Tons Per Completed Load | | | 2.77 |

7.2 Eager Beaver

- 20 cubic yard capacity
- Two to six individual compartments with sliding doors
- Typical two to three-man operation

Eager Beaver recycling trucks are no longer being manufactured. Used Eager Beaver vehicles may be available from a variety of used equipment vendors.

8.0 WASTE AND RECYCLABLES COLLECTION ALTERNATIVES

In line with the Township’s goals, GF identified several recycling program alternatives that can improve the efficiency and convenience of the Township’s curbside recyclables collection program. The level of convenience directly impacts residential participation, and will be a driving factor in the success achieved from an enhanced recycling program. The selected

recycling program alternative should result in increased recycling rates if it is a convenient recyclables collection system and if the program is reinforced by education and enforcement.

It is important for the Township to recognize that a zero tip fee arrangement for municipal waste does impact the economic feasibility as well as the mechanics of waste and recycling alternatives. There is no tip fee assessed in Delaware County on residential municipal waste because disposal costs are included as a municipal tax paid by County citizenry. This makes it difficult to demonstrate the “avoided cost disposal” from recycling efforts in terms of direct benefit to the Township. GF has identified a number of structural flaws with the current waste and recycling program as part of this study and although improving the system is recommended, it will likely result in increased costs. Therefore, to maximize the direct benefits for the Township, the recommended alternative should result in the implementation of a Township-wide waste and recyclables collection system that maintains a high level of service while minimizing the total system costs (is seen as a lower cost per household).

Based on GF’s experience with other municipal recycling programs throughout Pennsylvania, the following sections identify recycling program alternatives that can improve recycling convenience and recycling rates in the Township. An overview of each of following alternatives is provided in the following sections:

- **Municipal bid for bundled waste and recyclables collection**
- **Increase Public Works Department recycling services**
- **Municipal bid for recyclables collection only**
- **Revisions to the existing recycling ordinance**
- **Pay-As-You-Throw Waste Collection System**

To change the waste collection system using any alternative or combination of alternatives, the Township Commissioners will need to make decisions on how to structure and implement the program. Because the Township currently has a private subscription waste collection system and the Public Works Department provides curbside recycling services, it may be favorable for the Township to implement an enhanced waste and recyclables collection system using a phased approach.

In the initial phases, the Township could continue private subscription waste-only collection and continue public recyclables collection. In the first phase(s) the Township could improve the waste and recycling program structure, convenience and level of service. These changes may be accomplished by adding provisions to the ordinance, increasing the frequency of recyclables collection provided by the Public Works Department, expanding the list of recyclables, providing new (larger) recycling containers, etc. The initial phases would target the development of a more complete waste and recycling structure in the Township that would be representative of what the Township program envisions for future years. These changes could increase costs associated with the program. In later phases, the Township should consider playing a larger role in waste collection, likely through the implementation of a comprehensive waste and recyclables collection contract.

8.1 Alternative 1: Municipal Bid for Bundled Waste and Recyclables Collection

Case studies throughout Pennsylvania have demonstrated that municipal-wide waste and recyclables collection contracts with a single-hauler can improve the level of waste and recycling service while reducing the cost per household. Case studies show that the cost per household for curbside waste and recyclables services is typically 15 – 35 percent less in a single hauler program when compared to a private subscription program. GF was not tasked in the study to complete a detailed analysis of single-hauler collection for NPT, but there are many advantages to using a single, contracted waste hauler. Some advantages include:

- Bundling waste collection and recyclable collection service together creates a more attractive package for prospective bidders, which results in a competitive price per household (as much as 35 percent lower than private subscription system costs).
- Creates a more uniform collection system with a binding legal agreement to ensure waste and recycling services are handled properly and in accordance with ordinances and laws.
- Recycling education is much easier because the services provided are consistent.
- Greater oversight of the community's health, safety, welfare and attractiveness.
- Reduced vehicle nuisances (e.g. noise, traffic, emissions, damage to streets/alleys, etc.).
- Increases the level of services included under the contract (e.g. include bulky collection).
- Increases collection efficiency for the overall collection system.
- Managing competition through the municipal bid price creates competition, which results in a fair and competitive price per household for the services offered.

Implementing a single hauler contract collection system in NPT can result in an improved waste collection system with enhanced recycling service. The municipal bid documents can spell out any desired level of service. In a typical scenario, the Public Works Department would no longer provide curbside recycling services for aluminum cans, bi-metallic cans, and clear glass. The enhanced recycling program under a single hauler contract could include the addition of other curbside collected recyclable materials (e.g. plastics, colored glass, etc.). The recyclables collection schedule could be set at weekly (often the same day as trash) or bi-weekly. Even with a convenient collection schedule and additional materials collected, a contract with a single hauler is not expected to increase the cost per household currently paid by Township residents for waste collection services.

Transitioning from a private subscription service to another type of collection system is a big step. There are usually political barriers, political dynamics, and a noisy public minority that can make it difficult to get the support needed to move forward with this collection alternative. Private hauling companies will usually be visibly against the change and will gather support from their customers to resist the change. If the Township would pursue this alternative at any time, the Township Commissioners should become very familiar with this type of program to be poised to answer questions from the public. In order to understand the true public opinion on important waste and recycling issues, it is suggested the Township conduct a random residential survey well in advance of making decisions on the waste collection system. An example of a residential survey for waste collection and recycling is provided in **Appendix C**.

GF encourages the Township to view waste and recycling as integrated services. In the current private subscription system, the Township does not pay directly or indirectly any tipping or disposal fees. Without being tied to the cost for disposal, the incentive for the Township to

maximize the “avoided” cost of disposal (through recycling) is minimized. The most successful waste and recycling programs reviewed by GF usually: have one entity providing waste and recycling service; maximize the “avoided cost of disposal” by diverting tons from disposal; and gain revenue on some or all recyclables.

The NPT Comprehensive Plan includes the following municipalities:

- **Swathmore**
- **Rose Valley**
- **Rutledge**

If the Township moves ahead with a waste and recyclables collection contract, it should consider a joint contract with these and/or other municipalities. Offering a larger service area in a municipal bid can increase competition among bidders and result in a lower cost per household. The cost of preparing a municipal bid document varies widely depending on the service options desired. Adding multiple municipalities to the bid process usually increases the cost of bid document preparation. GF estimates the cost of preparing a standard bid document for the Township to be about **\$4,000 - \$7,000**.

8.2 Alternative 2: Increase Public Works Department Recycling Services

For the discussion of Alternative 2, we have assumed that the Township’s private subscription waste collection system remains in place under this alternative. However, if the Township elected to contract Township-wide waste collection only (without recyclables collection) via municipal bid, the Township could still implement an enhanced recyclables collection program using the Public Works Department.

The Township Public Works Department currently provides once-per-month curbside collection of aluminum cans, steel/bi-metal cans, and clear glass. The Township could expand and improve the level of curbside recycling service that is provided by the Public Works Department. The primary change that will occur under Alternative 2 will be an increase in the number of curbside collections that are provided per month by Public Works Staff. At a minimum, recyclables should be collected bi-weekly. The Township should also consider expanding the list of recyclables that are currently collected. Without including paper and plastics in the curbside program, the Township is missing sizeable components of the residential waste stream. Additionally, fiber and plastics are accepted by at least two local recyclables markets.

As part of implementing enhanced curbside recycling by the Township and Public Works Department, GF recommends the following:

- Procure new curbside recycling equipment with improved recyclables collection and loading capacity (as compared to the Eager Beaver) to improve curbside collection efficiency and reduce labor and other operational costs. Specifications for two curbside collection vehicles are included in **Appendix B**.
- Submit for Act 101, Section 902 Recycling Grant funds for up to 90 percent reimbursement of recycling equipment costs.

- Implement and maintain a recycling education campaign.
- Collect additional recyclables materials to maximize material diversion from the waste stream to recycling.
- Maintain relationships with multiple local markets and earn revenues from sale of recyclables.
- Increase the frequency of curbside recyclables collection to a minimum of once every two weeks.

8.3 Alternative 3: Municipal Bid for Recyclables Collection and Processing Only

In Alternative 3, the Township could continue to allow waste to be collected by multiple private haulers and use a municipal bid document (Request for Proposals) to secure recycling service only. In this alternative, container recyclables would no longer need to be collected at the curbside by the Public Works Department. The level of service would be determined by the specifications and terms of the recyclable collection contract. Based on GF's experience, municipal bidding for recyclables collection only is not a preferred or cost-effective method to secure comprehensive curbside recycling services when compared to some other alternatives. In large part, this is because municipal waste collection and disposal would not be bundled along with the recycling service. Without the waste component, the Request for Proposals may not foster competition among prospective bidders. The result in many cases is that a recyclable collection service contract by itself results in a higher cost per household (for recycling service) than the contract price per household for recycling in a bundled waste and recyclables contract. There may also be inefficiencies, inconsistencies and other problems related to managing the waste collection system when the selected recyclables collection service provider is different from the waste hauler(s) operating in the Township.

8.4 Alternative 4: Revisions to Existing Solid Waste and Recycling Ordinance

Generally, revisions to the Township ordinance should accompany any major change to the waste and recyclables collection system, regardless of what alternative is implemented. However, Alternative 4 places emphasis on revising the solid waste and recycling ordinance so that the ordinance plays leading role in structuring and enforcing the waste and recyclables collection system.

NPT last updated the existing ordinance in 1992. The 1992 amended ordinance substituted bi-metal cans for newsprint as the third curbside material. In concept, solid waste and recycling ordinances are intended to be implementing documents used to ensure that waste and recyclables are managed properly in the Township. Based on GF's experience, most ordinances fall short of being a working mechanism that influences how waste and recyclables are managed; particularly in municipalities like NPT that have private subscription waste services.

Simply updating language in an ordinance will not result in a significantly improved collection system. Ordinances must be tied to recycling education and enforced by an active and supportive Code Enforcement Department or similar entity. Without increasing the level of enforcement for waste and recycling services in the Township, alternative 4 will not be an effective way to enhance

waste and recycling services. If the Township elects to keep the current private subscription waste collection system and public recycling system, GF recommends the Township consider the revisions to the ordinance:

- Accurately reflect the minimum standards for leaf waste collection as required by Act 101.
- Limit the number of days haulers are permitted to collect in the Township. Based on the size of the municipality, limiting the number of days to two (2) appears appropriate. Other municipalities that limit days via ordinance usually specify the days of the week (e.g. Thursday and Friday only).
- Expand the list of recyclables in the ordinance to reflect the enhanced recycling program or include minimum recycling requirements in the ordinance and add the detailed recycling information in a short Policies and Procedure (P&P) document attached to the ordinance.
- Add provisions to the ordinance that increase the ability of the Township to issue and pursue warnings and citations/penalties related to improper preparation and handling of waste and recyclables by residents and owners (e.g. rental property and multi-family establishment owners). Some municipalities designate a Code Enforcement Officer or “other designee” the power to issue citations. Enforcement follow-through will require support from local police and the local District Magistrate.

Some of these ordinance revisions may be valuable regardless of the alternative selected by the Township.

Policies and Procedures document: Some municipalities successfully use a P&P document that is referred to in the Recycling Ordinance to address details of the waste and recycling program. This helps to keep the details out of the ordinance. For example, the Township ordinance could state that the Township would meet the Act 101 minimums of at least three curbside-collected recyclable materials plus leaf waste. The P&P could more accurately reflect a larger list of recyclables in an enhanced recycling program. A P&P document allows the Township to modify/revise details of the program without having to go through the full ordinance revision process with the Township Commissioners to amend the ordinance for every revision. P&P documents can be as short as 1-3 pages and should always be attached to the ordinance.

8.5 Pay-As-You-Throw Recycling

GF has evaluated the feasibility of implementing Pay-As-You-Throw (PAYT) waste collection programs in a number of Pennsylvania municipalities. In PAYT programs, residents pay a fee based on the number or capacity of trash bags/containers that are used for curbside set-out of waste. Because residents are charged a fee that is based on the quantity of waste disposed, PAYT creates a financial incentive for residents to divert materials to recycling. In other words, more recycling means less paid by the household and/or homeowner for trash disposal.

GF did not complete a detailed analysis of implementing PAYT waste collection in NPT. However, GF understands that PAYT waste collection may not offer the same advantages to NPT as it offers to many other Pennsylvania municipalities. Because there is no tip fee paid for

Township generated municipal waste from residential establishments, PAYT does not offer the same financial incentive (to divert materials to recycling) when compared to municipalities that pay a disposal tip fee.

Additionally, in the current private subscription waste collection system, PAYT implementation may be complicated and difficult to manage. If the private subscription waste collection structure remained, the Township could make major revisions to the ordinance to require haulers to provide PAYT waste collection service. However, PAYT is not recommended if the private subscription system remains for the following reasons:

- There would be little ability to provide oversight of the PAYT program with multiple hauling companies.
- There would be little control over residential costs and bag distribution.
- There may be some incentive to recycle, but the financial incentive for the Township and residents would be lost because PAYT is largely based on residents having control of their waste costs, which is tied to reducing the amount of tip fees paid to the disposal facility.

The Township could implement PAYT waste collection by procuring waste collection equipment to provide public waste collection, or by securing a hauler via municipal bid to provide PAYT waste collection services. In either scenario, it appears that an economically feasible, manageable, and sustainable PAYT system would be difficult to implement and administrate in NPT.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Nether Providence Township is mandated to provide residential curbside recycling by the Pennsylvania Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101). Approximately 90 percent of the establishments are single family households. Several private waste hauling companies contract with residents for waste-only collection service. The Township Public Works Department provides once-per-month curbside collection of **aluminum cans, clear glass, and steel and bi-metallic cans**. The Public Works Department also operates a small supplemental recyclables drop-off site that accepts:

- | | |
|----------------------------------|------------------------|
| ▪ Newspaper | ▪ Clear glass |
| ▪ Magazines | ▪ Green glass |
| ▪ High-grade office paper | ▪ Brown glass |
| ▪ Corrugated cardboard | ▪ Aluminum cans |
| ▪ Paperboard | ▪ Bi-metal cans |

Leaves are collected seasonally by the Public Works Department and are composted in windrows at a paved compost site owned by Swarthmore College and shared by NPT and Swarthmore Borough.

9.1 Conclusions

There are many conclusions and recommendations contained in the body of this report. Section 6.0 provides a GF summary of our waste and recycling program observations and evaluation. Some of the key conclusions for this study are:

- NPT housing density, the high number of single-family households and wide streets are **favorable factors for efficient curbside collection of waste and recyclables**.
- The existing recycling program is inconvenient and confusing for residents. This is primarily caused by the once-per-month collection schedule and the limited number of recyclable materials that residents are permitted to recycle.
- The curbside recycling program does not include collection of colored glass, plastics, and paper, which are recoverable and substantial components of the residential waste stream.
- It is estimated that only 20 percent of households set out recyclables on curbside collection days.
- The existing Eager Beaver recycling truck is not an adequate collection vehicle for an enhanced recycling program. This vehicle requires frequent unloading, which can significantly increase operational costs and hinder implementation.
- The public recyclables drop-off has a very limited footprint and it does not appear there is any room to expand. Adding materials (e.g. plastics) and/or additional volume could hinder the ability to manage this facility safely and efficiently.
- There are at least three recyclables markets within twenty miles of NPT, thus offering outlets for a comprehensive list of recyclable materials.
- Private subscription waste collection service in the Township creates inefficiencies in waste collection, which produces higher operational costs that are passed on to homeowners.
- Because disposal costs are paid by citizens via municipal tax and because there are no tipping fees assessed to residential municipal waste generated in the Township, the “avoided cost of disposal” becomes less tangible or an indirect benefit to the Township and residents. Consequently, for the Township and its residents to realize the greatest total benefits over the long term, the Township should target a Township-wide waste and recyclables collection system that maintains a high level of service while minimizing the total system costs (as seen as a lower cost per household for waste and recycling service).
- Alternative 1: Municipal Bid for Bundled Waste and Recycling Service, appears to have the greatest potential of achieving a Township-wide cost effective waste and recycling program.
- In the current waste collection system, as costs for fuel, health care, equipment, and workman’s compensation continue to escalate, these costs are passed on to residents. Changes to the waste collection system structure and program implementation will be required to improve Township’s ability to manage these costs on behalf of its residents.

9.2 Recommendations

GF recommends that the NPT Recycling Task force, the Public Works Department, and the Township work closely to develop a clear vision of what the NPT waste collection system should look like in the future. This vision and the Township waste and recycling goals should be agreed upon and documented. Notably, waste collection and recycling should be viewed as integrated services, not as separate programs. Because the existing system is a private subscription service (with multiple haulers), it will take time to gather Township support and resources to fully integrate waste and recycling services in the context of the current waste collection system. With that in mind, the Township can consider a phased approach in order to achieve successful implementation of a long-term integrated and comprehensive waste and recycling program. In the first phase(s), the Township could implement fundamental program structure changes to improve the methods for waste and recyclables collection in the Township. Initially, the Public Works Department could continue to provide curbside recycling and private haulers could continue to provide waste collection service. As soon as it is feasible, GF recommends the Township give serious consideration to the next phase(s), which would include a Township-wide single-hauler contract for waste and recyclables collection services.

A number of recommendations are provided throughout the body of this report. Some of the key recommendations from this study are summarized as follows:

- NPT should initiate a phased approach to improve recycling and waste collection and in the first phase(s) address the following components of the collection program
 - **Recyclables collection schedule:** Change the curbside recyclables collection schedule to a minimum of once every two-weeks (bi-weekly).
 - **Recyclables containers:** Provide recyclables containers, at a minimum of 22-gallons to 32-gallons or larger, to all households.
 - **Recyclable materials:** Expand the list of recyclables collected from households.
 - **Recyclables collection equipment:** Replace the Eager Beaver collection vehicle with a Labrie Top Select collection vehicle or other larger capacity collection.
 - **Recycling ordinance:** Revise the current recycling ordinance to reflect the new program. It is recommended the Township use basic language that reflects how the Township will meet Act 101 “minimum requirements” in the ordinance and refer to program details in a concise Policies and Procedures (P&P) document that is attached to the ordinance.
 - **Waste collection schedule:** Via an ordinance, limit the number of days haulers are permitted to collect waste in the Township to two days (specify which days).
 - **Leaf Waste:** To meet Act 101 requirements, expand the curbside collection program for leaves, to include the minimum collection frequency for “leaf waste”. Leaf waste includes leaves plus **garden residue, shrubbery and tree trimmings, and similar material** (i.e. brush), but **not including grass clippings**. One curbside collection in the spring is all that is required for these materials, provided the Township continues

- to collect leaves in the fall and offers a drop-off location for leaf waste. Once-per-month collection is required of leaf waste if no public or private drop-off location is available (i.e. in or near the Township) to residents for leaf waste drop-off.
- **Funding:** Continue to submit for Act 101, Section 902 Recycling Grant funds to offset eligible costs for recycling equipment, containers and recycling education. Submit for Act 101, Section 904 Recycling Grant funds for reimbursement based on eligible reported tons for commercial and residential recycling. Pursue revenues from sale of recyclables, including compost, to the extent feasible. Maximize return on materials by providing clean recyclables and establishing good relationships and contracts with local markets.
 - It is recommended the Township implement Alternative 1: Municipal Bid for Bundled Waste and Recycling Services. Based on discussions with the Township and because it will take time to develop a clear vision of the Township’s program (and time to evaluate joint contracting with other municipalities), a phased program implementation approach may be needed prior to entering into a single-hauler collection contract for waste and recyclables. This alternative is recommended because GF’s experience and extensive review of case studies across Pennsylvania have clearly shown that single-hauler contract collection systems out-perform nearly all private subscription waste collection systems. By bundling waste and recycling services and “managing competition”, the Township can secure and effectively implement a binding contractual relationship for waste and recycling services. With the Township taking an active role in managing combined waste and recycling services, it can better manage escalating waste collection costs that are currently being passed through to the residents unchecked. It is believed that Alternative 1 offers the greatest potential for implementation of a comprehensive waste and recycling program at the lowest cost to the Township and residents (as seen in as a cost per household for waste collection and recycling services).

APPENDICES

Appendix A
Site Visit Photos



Leaf waste Collection Truck and Box



Windrowed Leaves at Shaved Compost Site



Photo 3

Scarab Windrow Turner



Photo 4

Eager Beaver – Compartmentalized Recyclables Collection Truck



Photo 5

Recyclables Igloo (Provided by County)



Photo 6

Cardboard Drop-off Area

Appendix B
Recyclables Collection Vehicle Specifications



The Labrie Environmental Group distributes and supports its products via a 50-strong distributor network that spans the United States and Canada, and operates a U.S.-based Parts and Customer Support Center that offers maintenance, training, after-sales and parts services.



For further information about our products, contact a Distributor near you or call one of our offices at the numbers listed below. Our complete Distributor network is listed on our website at www.labriegrup.com

Labrie Environmental Group

 175, route du Pont,
Saint-Nicolas (Québec)
G7A 2T3 CANADA
☎1-800-463-6638
☎(418) 831-8250
☎(418) 831-5255
✉sales@labriegrup.com

 *Customer Support Center*
3630 Stearns Drive,
Oshkosh, WI 54903 U.S.A.
☎1-800-231-2771
✉sales@labriegrup.com



TOP SELECT™

Curbside recycling. Pioneered by Labrie.

The Top Select™ is a recycling unit built for manual and semi-automated collection of residential recyclable material. It is the most sold unit in-its-class in North America with over 3,000 vehicles in operation today.

Highly flexible. Maximized operations.

The Top Select™ optimizes collection operations by offering 2 to 7 compartments for pick up of different streams at curbside, for precise on-site sorting. The body-mounted partitions are put on rollers for 'no-tools-required', easy adjustability every 6 inches.

Easy and safe one-man operation. Maximum efficiency.

The Top Select™ offers a low-entry cab conversion with curbside driving station for optimal one-man operation.

Smooth operation. Maximum productivity.

The Top Select™ ensures smooth operation of the loading bucket through fully-adjustable hydraulic cushioning found at each end of the dump and return cycles. This generates high productivity levels (500+ households per route), and up to 10,000 lb payloads with the Maximizer configuration.

Enhanced options. Maximum versatility.

The Top Select™ can be configured through a variety of options such as wider loading buckets, auto-lock attachments for carts with/out commercial applications. They are all designed to ensure performing and reliable recycling collection operations.



Top Select™



1. Lightweight separators are made of recycled plastic and designed for no-tool-adjustment.

2. Multi-feature controls can be accessed from left or right-hand side of vehicle on all Labrie cab conversions.

3. Impressive 84" stroke-travel, hydraulic, Maximizer™, "adjustable on-the-route" compartment; offering Maximum compaction.

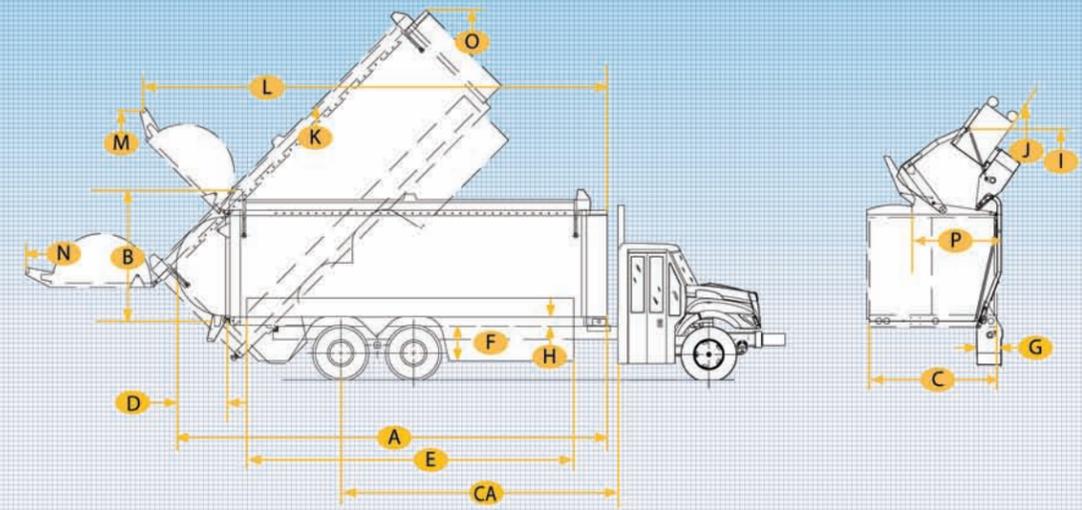


4. The Top Select™ can accommodate up to seven adjustable compartments.



5. The Top Select is designed with a unique over-the-top-system.

6. Steel mesh along top of body offers visual check on material level for easy on-the-route adjustability, and can be used to monitor the position of the Maximizer™ panel. Both interior panels and loading bucket separators adjustable at 6" (152 mm) intervals.



ISO
9001
CERTIFIED
(2000)

| Dimensions | Standard Body (2-axle) | | Long Body (3-axle) | |
|--|------------------------|-----------------------------|-----------------------|-----------------------------|
| | Imperial 42 cu.yd. | Metric 32 m ³ | Imperial 48 cu.yd. | Metric 37 m ³ |
| A O.A. length | 287" | 7290 mm | 323" | 8204 mm |
| B O.A. height above frame | 102" | 2591 mm | 102" | 2591 mm |
| C O.A. width | 102" | 2591 mm | 102" | 2591 mm |
| D Tailgate length | 40" | 1016 mm | 40" | 1016 mm |
| E Loading bucket length | 208.5" | 5296 mm | 244.5" | 6210 mm |
| F Loading bucket depth* | 33" / 25" | 838 / 635 mm | 33" / 25" | 838 / 635 mm |
| G Loading bucket width | 16" / 18" | 406 / 457 mm | 16" / 18" | 406 / 457 mm |
| H Loading height above frame* | 7" / -1" | 178 / -25 mm | 7" / -1" | 178 / -25 mm |
| I O.A. height over frame of lifting mechanism/roof | 152" | 3861 mm | 152" | 3861 mm |
| J Dumping angle, loading bucket | 58 degrees | 58 degrees | 58 degrees | 58 degrees |
| K Dumping angle, body | 45 degrees | 45 degrees | 45 degrees | 45 degrees |
| L O.A. height over frame, tailgate raised, body down | 313" | 7950 mm | 349" | 8865 mm |
| M O.A. length, tailgate raised, body down | 163" | 4140 mm | 163" | 4140 mm |
| N O.A. length, dumping position | 398" | 10109 mm | 434" | 11023 mm |
| O O.A. height above frame, dumping position | 212" | 5385 mm | 237" | 6020 mm |
| P Fixed roof to wall | 68" | 1727 mm | 68" | 1727 mm |
| CA Cab to axle | 168" | 4267 mm | 180" | 4572 mm |

*varies with loading bucket size

Body Specifications

| | |
|-------------------|------------------|
| Body Floor | 3/16" ASTM A569 |
| Body Side Walls | .12 ga ASTM A569 |
| Body Roof, Fixed | .16 ga ASTM A569 |
| Body Roof, Mobile | .13 ga ASTM A569 |
| Body Front | .13 ga ASTM A569 |

Body Capacities

| | | |
|-------------------------|-----------------------|---------------------------------|
| TOP-SELECT 1000™ | | |
| 2-axle chassis | .35 and 42 cu.yd. | (27 and 32 m ³) |
| 3-axle chassis | .44 and 48 cu.yd. | (34 and 37 m ³) |
| TOP-SELECT 2000™ | | |
| 2-axle chassis | .31 and 38 cu.yd. | (24 and 29 m ³) |
| 3-axle chassis | .39, 42 and 46 cu.yd. | (30, 32 and 35 m ³) |

Loading Bucket Specifications

| | |
|--------------------|-------------------|
| Lifting Capacity | 1000 lbs (454 kg) |
| Dumping cycle time | 15 seconds @ idle |
| Walls | .13 ga ASTM A569 |

Tailgate Specifications

| | |
|---------------------|------------------|
| Side and Rear Walls | .12 ga ASTM A569 |
|---------------------|------------------|

Maximizer™

| | |
|------------------------------|--|
| Packing Cylinder | .5" Bore x 3" Rod x 84" Stroke (127 mm x 76 mm x 2134 mm) |
| Packing Force on Recyclables | 40 000 lbf (9 kN) |
| Packing Force on Paper | 18 000 lbf (4 kN) |

Hydraulics

| | |
|---------------------------|---------------------------------|
| Pump | Commercial Intertech, gear type |
| Pump Flow | 18.5 gpm @ 1200 RPM |
| Hydraulic Reservoir | 35 gallons |
| Hydraulic System Pressure | 2000 psi |

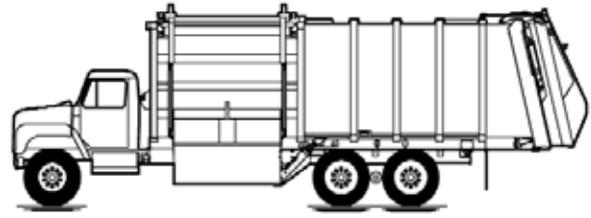
Cylinders

| | |
|-------------------|---|
| Body Lifting | 4 stages, telescopic |
| | .5" Bore x 152.5" Stroke (2-axle) |
| | .6" Bore x 185" Stroke (3-axle) |
| Loading Bucket(s) | 3 1/4" Bore x 1 1/2" Rod x 15 1/2" Stroke, nitrided |
| Tailgate | 2 1/2" Bore x 1 1/2" Rod x 28" Stroke, nitrided |

S P E C I F I C A T I O N S

Recycle 2000

Dual Chamber *Compacting* Recycle Unit



PERFORMANCE SPECIFICATIONS

Bin Lift Capacity.....1,000 Lbs.
 Bin Volumes.....4/10 Yd³ each
 Bucket Lift Cycle Time.....12 Seconds
 Working RPM.....750
 (operate-in-gear-at-idle)
 Homes Per Day (estimate).....up to 800
 Compaction.....750 Lbs. per Yd³

| HYDRAULIC SPECIFICATIONS | |
|----------------------------|---|
| PUMP | |
| PTO driven | Single cast iron, roller bearing |
| Maximum operating pressure | 2500 psi (17,237 kpa) |
| Working RPM | 1200 approximate |
| GPM at working RPM | 23 GPM (87 liters/min.) approx. |
| OIL RESERVOIR | |
| Gross capacity | 26 gallons (97 liters) – fill level |
| Sight gauge | Standard |
| Filters / Strainers | Return line 6 micron, 100 Mesh suction strainer |
| VALVES | |
| Suction Shut-off | Standard. |
| Control | Air actuated, 7 section hydraulic |
| Hoist and Tailgates | In-cab, air actuated. |

| BODY SPECIFICATIONS | | | | | | | | | | | | | | | | |
|---------------------|----------------|----------------|-----------------------|------|---------------|------|-------------------|-----|---------------|-----|----------------|------|-------------------------------------|--------|---------------|------|
| MODEL | BODY CAPACITY | | SPLIT BODY CAPACITIES | | | | HOPPER CAPACITIES | | | | OVERALL LENGTH | | OVERALL LENGTH TAILGATE/BODY RAISED | | OVERALL WIDTH | |
| | y ³ | m ³ | TOP (CO-MIX) | | BOTTOM (NEWS) | | TOP (CO-MIX) | | BOTTOM (NEWS) | | inches | mm | inches | mm | inches | mm |
| 2000-33 | 33 | 25.3 | 15 | 11.4 | 18 | 13.7 | 2 | 1.5 | 5 | 3.8 | 304 | 7721 | 415 | 10,541 | 96 | 2438 |
| 2000-38 | 38 | 29 | 18 | 13.7 | 20 | 15.2 | 2 | 1.5 | 5 | 3.8 | 336 | 8534 | 447 | 11,353 | 96 | 2438 |

| MODEL | OVERALL HEIGHT ABOVE FRAME | | | | BODY WEIGHT | | DUMP ANGLE | CYCLE TIMES | | BIN SPECIFICATIONS | | | |
|---------|----------------------------|------|-------------|------|-------------|------|------------|-------------|------------|--------------------|------------|--------------|------------|
| | BODY DOWN | | BODY RAISED | | BIN RAISED | | | BIN LIFT | PACK CYCLE | CAPACITY | DUMP ANGLE | | |
| | inches | mm | inches | mm | inches | mm | lbs. | kg. | | | | | |
| 2000-33 | 104 | 2641 | 218 | 5537 | 151 | 3835 | 15,800 | 7182 | 40 Degrees | 12 Seconds | 18 Seconds | 0.40 Yd. Per | 45 Degrees |
| 2000-38 | 104 | 2641 | 220 | 5588 | 151 | 3835 | 16,300 | 7409 | 39 Degrees | (Approx.) | (Approx.) | Compartment | |

| CYLINDERS | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--------------------------|------|--------|-------|--------------------------|------|--------|-------|-------------------------|------|--------|------|-------------|-------|----------------|-----|---------------------|-------|--------|------|---|------|----|-----|
| MODEL | LOWER TAILGATE RAISE (2) | | | | UPPER TAILGATE RAISE (1) | | | | UPPER TAILGATE LOCK (2) | | | | PACKING (2) | | BODY HOIST (2) | | TOP DOOR / BIN LIFT | | | | | | | |
| | BORE | | STROKE | | BORE | | STROKE | | BORE | | STROKE | | BORE | | STROKE | | BORE | | STROKE | | | | | |
| | inches | mm | inches | mm | inches | mm | inches | mm | inches | mm | inches | mm | inches | mm | inches | mm | inches | mm | inches | mm | | | | |
| 2000-33 | 3 | 76.2 | 25.25 | 641.4 | 3 | 76.2 | 18.44 | 468.4 | 3 | 76.2 | 3.63 | 92.9 | 4 | 101.6 | 37 | 940 | 4 | 101.6 | 56 | 1422 | 3 | 76.2 | 22 | 559 |
| 2000-38 | 3 | 76.2 | 25.25 | 641.4 | 3 | 76.2 | 18.44 | 468.4 | 3 | 76.2 | 3.63 | 92.9 | 4 | 101.6 | 37 | 940 | 5 | 127 | 67 | 1702 | 3 | 76.2 | 22 | 559 |

| CHASSIS REQUIREMENTS | | | | | | | | |
|----------------------|--------------|--------|--------|--------|-------------|-------------|-------------|-------------|
| MODEL | CAB TYPE | GVWR | GAWR | | USEABLE CA* | USEABLE CT* | WHEELBASE* | MINIMUM AF* |
| | | | Front | Rear | Recommended | Recommended | Recommended | Required |
| 2000-33 | C.O.E. | 38,000 | 12,000 | 26,000 | 186" | N/A | 209" | 60" |
| 2000-33 | C.O.E. | 46,000 | 12,000 | 34,000 | N/A | 177" | 197" | 75" |
| 2000-33 | Conventional | 38,000 | 12,000 | 26,000 | 186" | N/A | 254" | 60" |
| 2000-33 | Conventional | 46,000 | 12,000 | 34,000 | N/A | 177" | 245" | 75" |
| 2000-38 | C.O.E. | 46,000 | 14,000 | 34,000 | N/A | 190" | 210" | 75" |
| 2000-38 | Conventional | 46,000 | 12,000 | 34,000 | N/A | 190" | 254" | 75" |

* Useable CA is for Single Rear Axle Units. Useable CT is for Tandem Rear Axle Units.

- Specify chassis, engine and transmission upon entering order
- Any truck requiring special alterations, moving battery boxes, air tanks, etc., will not be altered until a letter authorizing changes is received by The Heil Company.



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All designs, specifications and components are subject to change at the manufacturer's sole discretion at any time without notice. Data published herein is for information purposes only and shall not be construed to warrant suitability of the unit for any particular purpose, as performance may vary with the conditions encountered. The only warranty is our standard written warranty for this product at time of shipment.

Appendix C
Example Residential Survey

Not included in on-line version of report