DUTCHESS COUNTY
RESOURCE RECOVERY AGENCY

FLOW CONTROL
&
SOLID WASTE MANAGEMENT ALTERNATIVES

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EXECUTIVE SUMMARY

Germano & Cahill, P.C., together with Gerhardt LLC have been engaged by the Dutchess County Resource Recovery Agency ("DCRRA" or the "Agency") to participate with an advisory team consisting of representatives of the Agency, local municipalities, the private sector, and Dutchess County officials to assess "the advisability of re-implementing solid waste flow control in Dutchess County as a primary means of minimizing the County's financial support of the Dutchess County Resource Recovery Agency while assuring environmentally-sound and low-cost waste disposal to County residents." This report examines the solid waste services provided by the Agency, the performance of Agency facilities, and the costs passed on to Dutchess residents and businesses through tipping fees charged to users of Agency facilities and financial support from the County. It should be noted that although this report contains substantial information that can serve as the foundation for the Dutchess Local Solid Waste Management Plan (LSWMP) required by the State Department of Environmental Conservation for submission in 2010, it is not intended to supplant the LSWMP.

E-I. SUMMARY OF CURRENT CONDITIONS

The Agency cannot currently secure sufficient waste revenues to operate its facilities and provide services to the public without subsidy from the County. The Agency's primary revenue source is the fee charged for the delivery of non-recyclable solid waste to the Agency's waste-to-energy Facility at Sand Dock Road in Poughkeepsie.[1] The core of the problem is that the Agency has no means of attracting waste to the RRF except by keeping the tipping fee competitive with the cost of transporting local waste to distant landfills. Eighty percent of the waste generated in Dutchess County is collected by private waste haulers, who are under no obligation to use Agency facilities, and can

[1] This fee is commonly referred to as a tip fee or tipping fee which is assessed on a per ton basis for the discharge of waste at a disposal facility. Revenue raised by the fee can cover the cost of disposal and, as is the case with the tipping fee at the Agency RRF, other expenses incurred for services such as recycling and household hazardous waste management. When a tipping fee covers more than just disposal costs, or when it covers a facility with higher levels of environmental protection and therefore higher costs, it is very difficult to compete with a facility like a landfill that is much less expensive to build and operate, and provides no other service.

take advantage of low fees at out-of-county facilities if the Agency's fees are not kept low enough, through County subsidy, to attract their business.

At the same time, the Agency's approach to solid waste management through waste-to-energy is fundamentally sound. Waste-to-energy provides far greater environmental benefits than would be obtained if County waste was managed through long-haul disposal at out-of-county landfills. The Agency's Resource Recovery Facility operates well within all New York State Department of Environmental Conservation permit limits for the emission of regulated pollutants. We have applied the US EPA's WARM program which demonstrates that the use of waste-to-energy and recycling compared to landfilling produces significantly lower volumes of greenhouse gases and uses far less energy.

Even greater environmental benefits could be obtained with more efficient employment of the waste-to-energy Facility, in conjunction with substantial improvements to the County's recycling program.

From a financial perspective, County subsidies to the Agency's waste program will continue to be required pending changes in three economic areas: 1) an increase in the market rates for alternative disposal (primarily long-haul transport and disposal) which would allow the Agency's tip fees to be raised proportionately; 2) increases in wholesale energy prices and recyclable commodities marketed by the Agency, providing more direct revenue to the program; and 3) increases in the total non-recyclable tonnage managed by the Agency, which would introduce economies of scale and maximize the use of the waste-to-energy Facility.

The County's subsidy comes through the payment of a Net Service Fee, which arises from the 1984 Solid Waste Disposal Agreement (Disposal Agreement) between the Agency and the County, most recently amended in November 2007. Under the Disposal Agreement, the Net Service Fee represents the difference between all of the Agency's costs for operations, and all of its revenue from all other sources, including tip

fees and revenue from the sale of electric energy and recyclables delivered to the Agency's Materials Recovery Facility in Poughkeepsie. Since 2005, the Agency's costs increased with the installation of environmental improvements at the waste-to-energy Facility mandated by amendments to the federal Clean Air Act and implementing state regulations. But the Agency was not able to raise its tip fees during this period, and as a result, the Net Service Fee from the County has increased from $1.2 million (2005) to a budgeted $6.9 million (2009).[2]

Revenues from the sale of electricity generated at the Agency's waste-to-energy Facility increased 43% from 2005 through 2008, holding the actual Net Service Fee payments below budgeted amounts during this period. However, the current economic downturn has sharply reduced the wholesale price paid for electricity. Electric revenues are based on the avoided cost of supplying energy from alternate sources by Central Hudson Gas & Electric (CHG&E), and are supported by a floor price of $0.06/KWh in the Agency's agreement with CHG&E. In 2008, energy revenues exceeded $4 million based on avoided costs of $0.09/KWh, but the current economic downturn has depressed wholesale electric prices severely, and it is unclear when CHG&E's avoided costs will again reach the rates paid by CHG&E for Agency power in 2008.

Revenues from the sale of recyclable materials also increased during the 2005-2008 period, reaching a high of $493,639.00 in 2008, and net revenues, after payment of processing costs of $260,418.00. However, recyclable markets also plunged in late 2008, and it is unclear when they will recover.

Moreover, the economic down turn of 2008-2009 has resulted in even lower prices for transport and disposal of waste at landfills. As a result, we see no likelihood that the Agency could substantially increase its revenues and thereby reduce or eliminate

[2] The Agency's initial budgeted figures for the Net Service Fee have historically been very conservative. In 2008, the Agency budgeted $5.5 million in Net Service Fee Revenue and the actual amount required and paid was $3.49 million. In 2009, the County budgeted $6.3 million for the Net Service Fee payment, and it is unclear whether this amount will be required.

County payments of the Net Service Fee in the near term, unless significant changes are made to the structure of the solid waste system in Dutchess County.

We have examined the waste management system established by the Agency to suggest improvements for the short and long term, and to consider the use of flow control as a means of securing the delivery of waste to Agency facilities, and to establish the foundation for a new solid waste management plan for the future.

E-II. RECOMMENDED OBJECTIVES

Based on a comprehensive review of the Dutchess County solid waste management system, our recommended actions have been developed to meet three (3) objectives:

A. Green The System – Improvements in recycling, specifically the development of a new single stream materials recovery facility, can increase the amount of recovered materials, increase participation by residents and businesses, and allow greater efficiency for waste haulers. The Agency has an exemplary record of environmental compliance at the Resource Recovery facility. Actions can be taken to improve the existing household hazardous waste program which will help maintain the performance and emissions record of the RRF. These efforts should be made a priority to help assess the need for additional waste-to-energy capacity for waste that cannot be recycled. Also, new initiatives with the County's major institutions can capture additional organics for recovery and reuse. These initiatives will help decrease the environmental impacts associated with the solid waste generated by the residents, businesses, industries and institutions of Dutchess County.

B. Level the Playing Field – The Agency and the County should expand the solid waste system to serve all residents and businesses in the County. Currently, only a portion of the County is served by the RRF and the MRF, yet all County taxpayers subsidize the cost of operating the under-sized system. A county-wide public system can be established through flow control so that all residents are receiving the full-range

of services provided by the DCRRA and all are paying equitably--based upon the amount of waste they generate. Flow control will also guarantee a uniform disposal cost and level playing field for all waste haulers whether they are large or small, public or private.

C. Optimize Waste-to-Energy – Flow control of waste generated in Dutchess County can establish a County-wide, full-service waste management system. Such a system would maximize recycling, reduce the amount of non-recyclable waste requiring disposal, and allow the Agency to procure or provide new waste-to-energy capacity for the balance remaining. Operation of the RRF will be improved through reliable supply of waste, greater on-line availability and greater power production and revenue. In the near term, the Agency should commission a thorough study of the condition and life expectancy of the RRF in anticipation of a competitive procurement for a new operator and possible capital improvements after the expiration of the current operating agreement in June 2014.

E-III. FINDINGS AND RECOMMENDATIONS

We have identified several areas in which we believe that the solid waste and recycling services provided by the Agency and the County could be improved. We propose specific changes to the existing solid waste management system, including development of a new single stream materials recovery facility, support to coordinate independent initiatives in green waste composting within the County, increased efficiencies in the generation of electric energy by the Agency's Resource Recovery Facility (RRF), the addition of transfer capability for waste that cannot be processed at the RRF, and in the long term, the expansion of the RRF to add a third combustion train with attendant capacity for the generation and sale of electric power.

We recommend the adoption of new flow control legislation to direct local waste to the public facilities constructed for the County. We also recommend that the public waste system be expanded to assume responsibility for disposal of all municipal solid waste

generated within the County, with a view toward eventually expanding the use of waste-to-energy as the management method for the non-recyclable fraction of the County's waste stream. We recommend that flow control be re-established to secure the delivery of waste and recyclables to the public system, and that the fees charged for Agency services reflect the actual cost of system operations.

We recommend that the County subsidy be phased out through a combination of incremental tip fee increases coupled with action to increase energy revenues and recycling revenues. We recommend that the annual County appropriation for payment of the Net Service Fee be replaced by a permanent volume-based Environmental Service Charge or Green Fee administered by the County to fund specific environmental costs and reserves. The new charge should be a user fee, assessed against real properties in proportion to the amount of solid waste generated at various land use classifications.

A. Existing System and Waste Stream

1. Waste Volumes and Collection Practices

The United States Census 2007 estimate of the Dutchess County population is 292,746. Unlike most Upstate New York communities, the County has experienced a population growth of approximately 14% since 1990. Most notably, in that same period, the populations of the Towns of Beekman, Pawling and East Fishkill have increased by 30%, 26% and 15%, respectively. During the same period, on a County-wide basis, the number of households has increased by approximately 19%. The number of occupied housing units is estimated in the 2007 Census at 112,110.

We estimate that the total amount of waste generated annually in Dutchess County, exclusive of construction and demolition debris, but including recyclable materials, is approximately 250,000 tons. Of this amount, approximately 10,000 tons is currently recycled through processing at the Agency's Materials Recovery Facility (MRF) in the

Town of Poughkeepsie, including most, if not all of the recyclables collected by the cities, towns and villages in the County. This represents only 4% of the total estimated waste stream. Additional recyclables are collected by the private sector and marketed elsewhere, but figures reported by private haulers to the New York State Department of Environmental Conservation do not necessarily reflect the origin of the material. We estimate that 30,000-35,000 tons [and up to 45,000 tons per year if a single stream system is employed] of recyclable paper and containers generated at County residences could be recovered from the waste stream with proper collection and facilities. Approximately 144,000 to 155,000 tons of non-recyclable waste, or about 57-62% of the total amount generated in the County, is processed at the Agency's RRF each year.

Collection of municipal solid waste is provided by a variety of methods in the County. A total of nine (9) municipalities (Cities of Poughkeepsie and Beacon, Villages of Millerton, Millbrook, Pawling, Rhinebeck, Red Hook, Tivoli and Wappingers Falls) provide public collection either using municipal crews or by competitively-bid contracts. This method of collection covers approximately 21% of the County population. The balance of waste collection, including collection of all waste from commercial sources, is accomplished through private arrangements between waste generators and private haulers. One hauler, Royal Carting, serves approximately 80% of the private market. The tipping fee paid by Royal is subject to an annual negotiation with the Agency. However, the Agency's bargaining position is limited by the options available to Royal, and all haulers -- readily available and inexpensive landfill disposal capacity. Royal's dominant market share coupled with the low cost landfill options and the lack of flow control means that the Agency has little leverage in negotiating an annual tonnage commitment and price. The 2009 agreement with Royal is for 115,000 tons at $73.75 per ton.

These market factors, therefore, determine what the County Net Service Fee has to be. Obviously these market factors put the Agency and the County in a tenuous position and impede the ability to do any credible long range planning.

Because the Agency's facilities provide limited service, and private haulers control the collection of nearly 80% of the waste generated in the region, (and one hauler has control of most of the market), the residents, businesses, industries and institutions in the County remain in a vulnerable position with regard to sharp price increases, exposure to environmental liability, and marginal recycling and toxics reduction. Because the Agency only handles a portion of the waste generated in the County, it is unable to ensure that all waste is properly handled and that the goals of the Dutchess County Solid Waste Management Plan are met. The exposure of all waste generators in the County to environmental liability for improper disposal is unmitigated because haulers are making decisions on where to dispose of waste based on the lowest tip fee available without regard to potential future environmental problems. The risk of significant price increases caused by fuel price spikes is real, and the continued dependence on long haul to landfill, leaves County generators vulnerable to significant increases in disposal fees at landfills as capacity adjusts to future market conditions. The Agency can take a series of actions that will insure stable costs, increase recycling and energy recovery, and minimize long-term environmental liability for the residents, businesses, industries, and institutions of the County.

2. Finances

The Agency's total budgeted expenditures for 2009 are $22,024,208.00 with $14,726,215.00 or 67% directly related to the operations of the RRF and residue disposal; $4,532,096.00 or 21% for debt service; and the remaining $2,765,897.00 or 12% for operation of the MRF, the HHW program, and all other system management. Annual debt service expense comes from two (2) bond issues. Repayment of the original RRF bonds constitutes $3.8 million of the annual debt service payment. These bonds will be retired on January 1, 2014, and annual debt service payments thereafter will be reduced to approximately $1.66 million per year. Agency costs for operation of the RRF are fixed pursuant to a contract with Montenay Dutchess LLC, a subsidiary of

Veolia Environmental SA, which expires in June 2014.[3] Prior to the expiration of that agreement, the Agency will need to procure a new operator for the Facility. In such a procurement, all terms governing the operation of the RRF will be open to competitive procurement and negotiation.

Agency revenues for 2009 are budgeted to derive from three (3) sources: tip fees ($11,476,500.00 – 52%), the County Net Service Fee ($6,930,608.00 – 31%) and energy revenue, material revenues and other sources ($3,617,100.00 – 17%). Agency revenue from tipping fees has fallen in recent years consistent with declines in delivered tonnage: 144,473 tons and $11.4 million in 2007, 142,844 tons and $10.5 million in 2008. The County Net service fee payments have correspondingly increased over the same period: $1.24 million in 2005, $2.12 million in 2006, $2.92 million in 2007 and $3.49 million in 2008. In 2009, the County's budgeted Net Service Fee is $6.3 million.

Revenue from energy has shown growth in recent years. Actual revenue from the sale of electric energy, including avoided cost revenue, was $2.93 million in 2004, $3.84 million in 2005, $3.17 million in 2006, $3.53 million in 2007 and $4.21 million in 2008, an increase of 43.6% over five (5) years. Expressed as a percentage of total Agency revenues, electric revenues from the RRF constituted 18.9% of revenue in 2004, 23.8% in 2005, 17.8% in 2006, 19.3% in 2007 and 21.6% in 2008. Revenues from the sale of recyclable materials have exceeded the cost of operating the MRF in recent years as well. However, both wholesale prices for electricity and commodity prices for recycled materials have declined steeply since late 2008, and it is difficult to forecast when either market will recover its former levels.

[3] On January 10, 2008 Montenay Dutchess, LLC formally changed its name to Veolia Dutchess LLC. No change in the ownership or terms of any agreements was effected by this filing. However, as of this writing the ownership of Veolia Dutchess LLC has been acquired by Covanta Energy Inc., and a change in both name and management is expected.

3. Facilities and Programs

MRF - The Agency's Materials Recovery Facility (MRF), located on Fulton Street in the Town of Poughkeepsie, is housed in a building owned by the County and was originally developed by New England CR, Inc. in 1990. It is has been operated by Hudson-Baylor Corp. since 2002, and is under a month-to month operating agreement at present. The Facility is capable of handling up to 18,000 tons of material per year through a dual stream processing system that sorts paper and cardboard, or commingled aluminum, metal, plastic and glass containers on separate sort lines.

The MRF is in poor condition and is equipped with obsolete equipment and technology. It is not capable of handling all of the recyclables generated from residences in the County, and is not susceptible to expansion. While it can continue operations for the near term, we believe it should be replaced by a modern "single stream"[4] Facility with sufficient floor area for tipping and materials storage to accept all of the residential recyclables generated in the County. Based on discussions with industry representatives, it is estimated that a pre-existing building of suitable size could be equipped with modern single stream sorting equipment for a cost of $6-$7 million; and a new, fully-equipped building of 50,000 sq. ft. could be constructed for approximately $12-$13 million.

HHW - The Agency provides numerous HHW collections at different locations throughout the County to offer a convenient service to residents Eight (8) such collections are planned for 2009. An even more extensive service could be provided with the construction of a permanent HHW Facility capable of accepting electronic waste, in addition to paints, pesticides and other household hazardous waste. We estimate the cost of construction of such a Facility, on a site owned by the Agency or the County, at approximately $500,000.00. Ideally, such a facility could be co-located with a new MRF and therefore benefit from available staff and oversight.

[4] A "single stream" recycling facility is one that is capable of receiving and processing a single stream of mixed paper and container recyclable, offering greater convenience to residents, and therefore, higher volume of recoverable material.

Composting - The Agency does not operate any facility for the composting of yard waste or food waste. However, we note that innovative composting programs are underway at the Culinary Institute of America, Vassar College and Bard College. These initiatives are consistent with other public solid waste systems that are targeting institutional food preparation waste as the priority, because it is more easily aggregated and kept free of contaminants. We recommend that the Agency support and cooperate with these programs. Given the scope and performance of these existing programs and facilities, we have not identified the need to develop a public compost facility, at least in the near term. Experience gained with institutional food preparation waste can be evaluated to estimate the feasibility of expanding to other generators and post-consumer waste streams.

Resource Recovery Facility - In 1985, the Agency undertook the procurement of a contract for the design, construction and operation of a 500 tpd resource recovery Facility with the purpose of combusting solid waste to accomplish significant volume reduction, to generate steam for sale as a heating/cooling source, and to generate electric power. A contract was awarded to a subsidiary of Pennsylvania Engineering Corporation, and was constructed at a cost of $40 million through revenue bond financing by the Agency, with a capital contribution of $13.4 million in Environmental Quality Bond Act funds from the State of New York.

The Resource Recovery Facility (the RRF or the Facility) is a "mass burn" design, equipped with two (2) O'Connor rotary waterwall combustors, each rated at a maximum capacity of 256 tons per day (tpd), and collectively permitted to operate at an annual average of 450 tpd. The Facility was designed to accommodate the future construction of a third combustor and boiler train, which remains an option for the Agency. The Facility produces steam which is used to generate electric power through a 9.2 MW turbine generator, and can be made available for direct sale for use as a heating source. During the period 1989 through 1998, steam was generated and sold for use at the IBM South Road complex, but in 1998 the sale of steam was discontinued and is not expected to be resumed. The loss of the Facility's steam sales customer represented a

net loss in the efficiency of the Facility, as the installed 9.2 MW turbine generator was not designed to convert the full steam production from the Facility into electricity. The Facility extracts approximately 314 KWh per ton of waste processed.

Operation of the Facility is efficient and it has met its performance warranties. Environmental performance has been excellent, with installation of Maximum Achievable Control Technology (MACT) in 2005, reducing emissions of regulated pollutants to levels well below allowable standards. Cost of Facility operation is in line with the other PEC-designed O'Connor Combustor facility in Islip, New York. The design of the Facility, and its relatively small size, does not afford the Agency the economies of scale that are available in other designs of larger size. However, the useful life of the Facility can be extended for an additional 25-30 years with proper maintenance and investment.

We recommend that the Agency undertake a diagnostic study of the Facility to determine the scope and cost of major maintenance that will be required to extend the life of the Facility for an additional 25-30 years. This effort should be undertaken as soon as possible in order to allow the Agency to plan for future investment, and to prepare for a procurement process to select a new long-term operator for the Facility after 2014. The diagnostic study should include an evaluation of the feasibility and cost of upgrading or replacing the existing turbine generator to increase electric power production, and an evaluation of the feasibility of expanding the capacity of the Facility by adding a third boiler train. We estimate that if recycling capabilities in the County are enhanced, the total amount of remaining processible waste generated in the County may be reduced to approximately 215,000 tpy, or 65,000 tons more than the Facility's current capacity, an amount that may be handled by the addition of a third boiler train.

Special emphasis should be placed upon gathering all relevant information on the condition of the RRF in preparation for the procurement of a new operator. The procurement will allow the Agency to evaluate the future of power markets and the potential for enhancing revenues through the generation of additional electricity, as well

as to revisit all of the provisions of the current operating agreement, including performance guarantees. Sufficient time should be allowed to procure and evaluate proposals, and to negotiate the terms of a new agreement.

We do not recommend that the Agency either close the existing RRF and rely on exporting waste to other communities, or that it construct a new replacement RRF at the same or another location.

B. Long-Term Environmental Goals

The comprehensive, integrated system approach to solid waste management has been proven effective over the past 20 years in Dutchess County and in other systems across the country. This approach reflects a prioritized commitment to a hierarchy that reduces waste, maximizes material and energy recovery, and landfills only the non-recyclable wastes and the ash residue from energy recovery.

As part of the State's planning process, the Department of Environmental Conservation is increasing and sharpening its policy initiatives in a push toward true waste reduction and high levels of waste recovery. The concept of product stewardship (making product manufacturers responsible for end of life management), is now in legislative proposals in New York and is likely to be the priority policy for the foreseeable future.

Like all other regions of the State, Dutchess County will have to address these new State plans and policy initiatives. Fortunately, the County has already built a strong foundation and can expand and enhance its current system to achieve long-term environmental improvements.

We have examined the overall environmental impact of the County's waste management practices using the US EPA's Waste Reduction Model (WARM) to assess the disposal methods available to the Agency. Currently, approximately 62% of the County's waste steam is managed through application of waste-to-energy technology at

the RRF. Only 4% is recycled and processed at the Agency's MRF, although a substantial volume of material is recycled at private facilities, and minor amounts of green waste are composted through college programs and private facilities. The destination of the balance is landfill disposal, often at a significant distance. Despite distance, landfilling is currently the cheapest alternative available in the waste market.

We believe the County can increase the amount of source-separated recyclables collected and processed from residences to the range of 35,000 to 45,000 tons per year. This could be accomplished if a modern single-stream MRF were established in the region. Single stream technology allows the processing of mixed loads of paper and containers, allowing homeowners to commingle these materials for a single collection instead of separating them and holding each material for alternate pickups. Single stream collection reduces costs for haulers and these saving can be passed back to the consumer. Commercial recycling, practiced by businesses and institutions, can account for additional tonnages. An increase in the fraction of the waste stream that is recycled diverts tonnage from landfills with corresponding environmental benefits.

Composting of green wastes can further reduce the tonnage destined for landfill disposal. Innovative programs are underway at local universities to manage institutional food wastes, which are a source of significant quantities of homogenous material, potentially yielding a marketable material for use as soil amendments, and agricultural products. We estimate that composting can be developed to account for at least 5,000 tons of green waste and institutional food waste in the County each year.

We estimate that the balance of the waste stream, after implementation of recycling initiatives, can be reduced to approximately 215,000 tons/yr. If this tonnage is managed through waste-to-energy technology instead of landfilling, the WARM model demonstrates that the County's waste management program would significantly reduce the generation of greenhouse gases.

C. Flow Control and Modernization of the Waste Management System

We conclude that the volume of the MSW waste stream in Dutchess is approximately 40% greater than the capacity of the Agency's RRF, and the amount of recoverable recyclables is two (2) times greater than the capacity of the MRF. We further conclude that most of the approximately 90,000 tons per year of MSW that is not handled by the RRF is transported to and disposed of in a variety of landfills in northern, central and western New York, while a relatively small amount is transported to waste-to-energy facilities in Westchester and Washington counties.

The County's Solid Waste Management Plan, adopted in 1992, contemplated the eventual expansion of the services provided to the people of the County through the RRF and the MRF, the only two (2) facilities established at that time. Both facilities were designed to service a "core area" in the southwest quadrant of the County, where the bulk of the population of the County resided. The plan contemplated expansion of both recycling and waste-to-energy service to the rest of the County, using flow control legislation originally adopted in 1984, as the means to secure the waste stream and support the construction of new infrastructure.

New infrastructure did not materialize for many reasons, including legal uncertainties surrounding the use of flow control power in support of public waste programs. In 2007, the Supreme Court clarified the law, holding that flow control laws designed to benefit a public waste system are constitutional. The utility of flow control legislation is that it can bring all waste generated within the County under one comprehensive planning strategy. We recommend that the County use this power to fulfill the original goals of the Solid Waste Management Plan, and expand recycling and waste-to-energy services to the balance of the County.

Flow control can be re-instituted in the County through amendment to the existing local laws governing solid waste in the County Code. The amended legislation should include a statement of the County's public purposes in solid waste management, and a

provision directing the waste and recyclables generated in the County to public facilities designated by the Agency under the Service Agreement with the County. Flow control provisions should be coupled with the County's existing licensing provisions, providing that violations of the flow control provisions will result in escalating civil penalties, and potential license revocation for repeated violations. Experience with this approach in other jurisdictions in New York has been successful.

The effect on licensed haulers can be managed through adequate notice and opportunity to adjust routes and fees to accommodate any changes in the tipping fees. Overall, all haulers would pay the same disposal rates, leveling the playing field to eliminate any competitive advantage in disposal costs. It will be important to aggressively enforce the law from the outset, in order to assure the hauling community that no exceptions will be tolerated. Experience in other jurisdictions shows that after acceptance of the law and re-alignment of delivery patterns to the designated facilities by the hauling community, compliance becomes widespread and enforcement staff can be reduced. However, we recommend that the Agency and the County assign at least one (1) full-time compliance officer, assisted at the outset by at least two (2) other individuals on loan from other duties, to enforcement efforts. We also recommend that any tip fee increases that may accompany the implementation of the law be stepped and moderate.

D. Transition

A transition from the current management system to a modern, full capacity integrated system with new infrastructure can occur over a period of years. Improvements and potential expansion of the RRF to provide greater waste-to-energy capacity should be explored in the context of the procurement of a new operating contract by 2014, but initial steps to evaluate the condition of the RRF should be undertaken immediately. Siting and construction of a new single stream MRF should involve discussions with private recycling firms and neighboring municipalities to assure sufficient flow of materials and maximum return on investment. These discussions can also begin

immediately. Establishment of green waste composting as a major management tool will require evaluation of local public and private programs and other experiments.

In the near term, however, the County and the Agency can assume responsibility for the disposition of all recyclable and non-recyclable waste generated in the County. For recyclable material, the County can implement flow control and utilize the existing MRF for a short period. During this time, the Agency can evaluate the potential for the development of a new regional single stream MRF.

For non-recyclable waste we recommend that flow control be implemented for all waste generated in Dutchess County and that the Agency implement a plan that will increase throughput at the RRF and use the competitive market to dispose of the remaining waste that exceeds the capacity of the RRF. The first priority for waste direction would be the RRF, and any excess waste delivered to the RRF could be transferred to either a transfer station or a contract disposal facility.

Two (2) new transfer stations would be needed to serve the remainder of the waste generated in the County. For the northern part of the County, the Agency could potentially utilize the UCRRA transfer station in Kingston, New York. The UCRRA disposal agreements with upstate landfills are favorably priced, but the UCRRA indicates that they require a minimum tonnage commitment to sustain pricing. The DCRRA can assure the UCRRA's tonnage commitments through direction of waste from northern Dutchess to the UCRRA transfer facility, billed at a Dutchess tip fee at UCRRA scales. Savings from utilization of UCRRA disposal arrangements can, in the medium term, reduce the cost per ton of managing Dutchess waste. Perhaps equally as important, this approach would recapture waste currently lost from Dutchess County to facilities in Ulster County.

In the southern part of the County, with flow control, sufficient waste can be directed to the RRF to assure full capacity throughout the year. To manage the balance of waste generated in the south, and to provide transfer capacity to Ulster for recyclables, the

Agency can procure the use of a privately-owned transfer facility through a lease agreement, and transport services through contract. Waste directed to this transfer station can be disposed of at facilities procured by the Agency under separate contract, and recyclables can be delivered to Ulster if or when the Agency determines that the MRF in Poughkeepsie should be closed. As with the use of the UCCRA transfer station, waste would be received for a Dutchess tip fee, which would serve to reduce the cost per ton of managing the County's waste.

These arrangements would remain in effect pending development of a new single stream MRF and sufficient waste-to-energy capacity to manage the balance of the waste stream.

E. Future Financial Structure

1. Agency Debt and Continued Operation of the RRF

We do not recommend that the Agency's services be reduced or discontinued. Aside from the significant environmental benefits that operation of the waste-to-energy Facility brings to the County, economic considerations preclude closure of the RRF, which is the Agency's major financial investment. From 2010 through 2014, the Agency is responsible for the repayment of $16,240,000.00 in principal for series 1984 revenue bonds, and from 2015 through 2027 for repayment of $16,140,000.00 in principal on the 2007 series revenue bonds for clean air act improvements to the Facility. Total debt service on these obligations will be over $52 million before the obligations are retired.

These obligations cannot be avoided by closure of the Facility. If the County's object were to defease the bonds and eliminate the Agency's debt as a step toward dissolving the Agency, a fund would have to be established to generate sufficient revenue to meet the Agency's obligations to the bondholders. These obligations would pass to the County. We estimate that a fund of not less than $27 million would be required to satisy

these obligations. None of these funds would be put to practical use in providing waste management services.

We do not believe it would be feasible to sell the RRF to a private operator, even if the object were to secure a return sufficient only to pay off the Agency's debt. A private operator prepared to invest in such a purchase would be saddled with debt of a similar size, and faced with the same competitive disadvantages relative to long-haul landfill disposal that the Agency is faced with. We estimate that, in the best case, the cost to operate the RRF by a private firm would compare unfavorably with the estimated cost of $70.00/ton to haul and dispose of waste at a landfill in the current market. We do not believe a private operator would be able to operate the Facility at a profit and still attract waste under current market conditions. The County could not guarantee a private owner a waste stream through flow control under current law.

Consequently, we believe that the Agency and the County should continue to operate the RRF and make every effort to improve its performance and maximize its efficiency through the use of flow control. We recommend that with the implementation of flow control, the Agency should raise its tipping fees only moderately. Initially, the Agency should eliminate discounts and apply the Agency's current posted fee to private haulers as well as municipal customers. Over time, the Agency can gradually increase rates to meet its costs, taking energy and recycling revenues into account.

This will require the County to continue to contribute a Net Service Fee for a period of time, although the growth of the Fee payments should be checked by increased tip fee revenues and improved efficiency at the RRF. Nevertheless, the Net Service Fee will remain an important element in the transition of the current system to a modern, full-service system with minimal environmental impacts.

2. Green Fee

We recommend that the County consider an alternate means of funding the Net Service Fee through an Environmental Service Charge, or Green Fee assessed to real properties on the basis of the amount of waste such properties generate on an annual basis. Currently, the Net Service Fee is funded through ad valorem property taxes, sales taxes and other revenues comprising the County's general fund. A Green Fee would be a special benefit assessment, levied pursuant to County Law §226-b, as an annual flat charge to different property classes, raising sufficient revenue on tons of waste generated per parcel, to pay for environmental improvements in the waste management system, such as the cost of operating the Maximum Achievable Control Technology at the RRF, among other services. It would not be an ad valorem assessment and would be applicable to a greater number of properties, including many properties otherwise exempt from taxation, because it would be a fee for service, and not a tax.

We have examined other special benefit, and "user fee" assessments in other communities and propose a potential framework for such a system in Dutchess. The framework would divide residential properties, based on the uniform New York State Property Classification System, administered by the Office of Real Property Services, into four (4) classes: single family, two-family and three-family homes, plus apartments, each differentiated on the amount of waste generated by each class each year. Non-residential properties, including commercial, industrial and institutional properties, would be divided into four (4) classes (small, medium, large and very large) also based on waste generation by land use. Our analysis was based on extensive field studies performed for Montgomery County, Pennsylvania, which utilzes such a system to fund its entire waste program.

We calculated the per parcel charges for each class with two (2) revenue targets. The first aimed to raise sufficient revenue to meet the budgeted 2009 Net Service Fee of $6.9 million. The second targeted $8.5 million, which included all costs for special

environmental benefits provided by the current waste system, plus an allowance for reserves to fund further improvements in recycling and waste-to-energy. Annual per-parcel charges are shown below.

TABLE 1

ENVIRONMENTAL SERVICE CHARGE/GREEN FEE				
PROPERTY CLASSIFICATION	PROPOSED FEE A	ESTIMATED REVENUE	PROPOSED FEE B	ESTIMATED REVENUE
Residential				
Single-Family	$ 45.30	$3,462,596.00	$ 55.80	$4,265,185.00
Two-Family	$ 67.95	$ 283,623.00	$ 83.70	$ 349,363.00
Three-Family & Apartments	$ 90.60	$ 388,130.00	$ 111.60	$ 478,094.00
Commercial/Industrial/Institutional				
Small	$ 200.00	$ 595,400.00	$ 250.00	$ 744,250.00
Medium	$ 800.00	$ 718,400.00	$ 1,000.00	$ 898,000.00
Large	$ 1,600.00	$ 958,400.00	$ 2,000.00	$1,198,000.00
Very Large	$ 3,000.00	$ 498,000.00	$ 3,750.00	$ 622,500.00
Total Revenue		$6,904,549.00		$8,555,392.00

Key:

A – Fees to meet current County net service fee revenue of $6.9 million per year.

B – Fees to meet current County net service fee revenue plus reserves for future projects – total $8.5 million per year.

The framework suggested is a model, and waste generation rates should be confirmed by field investigation before implementation. However, the use of a Green Fee, calculated to meet the cost of specific environmental benefits on a tons-generated basis, would be a transparent, and more equitable, means of distributing the marginal costs of the waste system to County taxpayers than ad valorem levies.

F. Specific Actions Recommended

This report recommends a series of specific actions to advance the Dutchess County waste management system from its current service level and fee structure to a self-sustaining and modern system with minimal environmental impacts. Achievement of all of the goals outlined here will require long-term commitment and steady, incremental progress over several years.

Summary of Recommended Actions

1. Develop a new single stream materials recovery facility.

2. Develop a survey to document the volumes and current management practices for green waste and for all major institutional generators of food waste in order to evaluate the potential for increased organics recovery.

3. Implement an Environmental Service Fee or Green Fee to cover the ongoing current costs of providing environmental protection services such as recycling, household hazardous waste management, and operation of the upgraded air pollution control system and to build reserves for future environmental protection facilities and projects. This will replace the County Net Service fee currently paid from the County general fund.

4. Implement flow control for all solid waste and residential recyclables generated in Dutchess County in order to provide a comprehensive, coordinated, and integrated management system.

5. Adopt a capital budget plan as part of the 2010 budget that designates new facilities and existing Facility upgrades and establishes a method to build reserves over the next five (5) years to finance new facilities, including:

- new MRF
- new HHW Facility
- new turbine for RRF

6. Contact the Ulster County Resource Recovery Agency to determine the feasibility of developing an intermunicipal agreement to receive waste from northern Dutchess County at the UCRRA transfer station in Kingston.

7. Complete an RFP process to secure a transfer station capability for haulers for waste generated in the southern part of the County.

8. Construct a new permanent HHW Facility to be operated on a year-round basis.

9. Initiate a diagnostic study of the existing RRF to identify the scope and cost of major maintenance, replacements and upgrades that will be required to extend the operating life of the Facility over the next 25 to 30 years.

10. Construct additional waste-to-energy capacity sized to reflect the performance of new single stream recycling, waste reduction and product stewardship, and increased organics recovery.

11. Continue to evaluate the development of a local ash landfill.

I. SUMMARY OF CURRENT CONDITIONS

A. System History

Dutchess County's attention to the challenges of providing a regional solution to the problems of solid waste management dates to 1972, with the delivery of an inventory of solid waste facilities then operating in the County, and a recommendation that the County provide a comprehensive regional public system.[5] The County has been served by a multitude of public and private landfills over the years. A 1990 inventory of inactive disposal sites compiled for the County Solid Waste Management Plan lists 22 public and 93 private inactive landfill sites in Dutchess County. Of these, over 60 were listed as inactive hazardous waste disposal sites by the NYSDEC. The County's response was to begin planning for a comprehensive regional public system to manage the County's wastes. In 1980, the County adopted a policy statement calling for the creation of a regional public authority charged with the development of a County-wide waste management system, utilizing resource recovery technology, and managing all waste generated in the County through public facilities. The Dutchess County Resource Recovery Agency was created on July 22, 1982 by the New York State Legislature to implement this policy.[6]

In the early 1980s, the County's main concern was to provide a substitute for the land burial of solid wastes through the use of a reliable means of recovering energy and reducing volume. County planning for the construction of a mass-burn waste-to-energy Facility pre-dated the formation of the Agency, and a Request for Proposals was issued

[5] Comprehensive Solid Waste Study, Dutchess County, NY. Detailed Report, William R. Trautman Associates, September 1972.

[6] The Agency is a New York public benefit corporation created by the enactment of Title 13-D of Article 8 of the New York Public Authorities Law and Chapter 43-A of the Consolidated Laws of the State of New York. The Act authorizes the Agency to collect, receive, transport, process and dispose of solid waste; to design, construct and operate, or to have designed, constructed and operated, solid waste management – resource recovery facilities; to sell, directly or indirectly, energy produced by a Facility and materials recovered from the system; to contract with the United States of America and the State with regard to grants and loans and with other municipalities, public corporations, or persons with regard to the collection, processing, or disposal of solid waste and the sale of energy products; to acquire property with the consent of the County Legislature and County Executive by eminent domain; to employ persons and contract with consultants; and to borrow funds to finance the design, construction and operation of solid waste management – resource recovery facilities.

by the County in June 1982. On its creation, the Agency assumed responsibility for the resource recovery project. A site was acquired in November 1984 and a contract to design, build and operate was awarded to Pennsylvania Resource Systems, Inc., a wholly-owned subsidiary of Pennsylvania Engineering Corporation (PEC) under a contract with the Agency dated December 1, 1984. The Facility began start-up and performance testing in 1987 and was accepted by the Agency for full operations in June 1989.

The RRF was originally sited and designed to serve a "core service area" in the southern and western parts of the County, including the Towns of Red Hook, Rhinebeck, Clinton, Hyde Park, Pleasant Valley, Poughkeepsie, LaGrange, Union Vale, Wappinger, Beekman, Pawling, Fishkill and East Fishkill, together with their constituent cities and villages, with the exception of the Village of Tivoli in Red Hook. These areas were included in the service area because they were the most densely populated areas in the County, and also because they had closed, or were closing, their local landfills. The Towns of Milan, Pine Plains, Northeast, Stanford, Washington, Amenia and Dover, plus the Village of Tivoli, did not express interest in being served by the RRF, and were operating their own municipal landfills at the time. The site of the RRF was chosen to take advantage of the opportunity to sell steam generated at the Facility to IBM.

By 1990, only six (6) landfills in the north and eastern parts of the County were still operating, and all were scheduled to close under Consent Orders with the NYSDEC. In recognition of these closures, and pursuant to State law, the County began preparation of its County Solid Waste Management Plan (the "Plan").

Dutchess County's early efforts to institute comprehensive solid waste management for the region preceded similar planning efforts by New York State. With the Solid Waste Management Act of 1988, New York adopted amendments to the Environmental Conservation Law that established local solid waste planning units at the county level. Planning units were charged with the preparation of an SWMP and the development of infrastructure to manage waste, pursuant to a hierarchy of i) reduce; ii) recycle; iii)

recover energy; and iv) utilize land disposal. (ECL §27-0106 and §27-0107). The management hierarchy established in 1988 has become the foundation of integrated waste management methods adopted by communities throughout New York.

The Agency has been established as the local planning unit for solid waste management in the County under State law. As the local planning unit, the Agency has prepared and published the Dutchess County Solid Waste Management Plan and obtained the requisite NYSDEC approval (dated February, 1992 and covering the planning period 1990-2010).

The County Solid Waste Management Plan recognized the foundations laid for integrated management in the County, and called for a number of improvements to the system, then being developed. The Plan was developed with a Generic Environmental Impact Statement and called for the achievement of the following objectives between 1992 and 2010:

- Support for state and federal legislative initiatives to reduce the amount of waste generated and encourage recycling.
- Adoption of a local law requiring the source separation of recyclables in the County.
- Construct and operate a Materials Recovery Facility for the processing and sale of recyclables generated in the County.
- Encourage the development of composting technology for yard wastes and green wastes generated in the County.
- Encourage the development of local municipal transfer stations at the Town level to provide recycling and drop-off services.
- Site and construct a landfill for the receipt of ash residue generated by the Resource Recovery Facility, and for the land disposal of waste that cannot be processed by the RRF.
- Expand the capacity of the Resource Recovery Facility to accept the wastes generated in the County that cannot be recycled after achievement of the County's stated recycling goals.

In the following years, some of these objectives were achieved. Legislation, such as the NYS Bottle Bill was adopted on the state level, and a local law mandating the source separation of recyclables was adopted on the County level. The Materials Recovery Facility in Poughkeepsie was constructed and remains in operation. Some progress has been made in the development of composting, particularly at large institutions in the County. Local transfer and drop-off facilities were constructed in most Towns to serve local residents.

Other objectives were not achieved. No ash landfill site was found and no landfill for ash or bypass waste was developed. As a result, ash from the RRF is exported to disposal sites outside of the County, and a significant fraction of non-recyclable waste is also transported privately for disposal at out-of-County locations. The MRF, built in 1992-93, is undersized and does not handle a large fraction of the recyclables generated in the County. The private sector provides some recycling services in addition to the public services offered at the MRF. Based on available information, achievement of the County's 1992 recycling goals of 47% recycling by 2010 cannot be confirmed. The RRF has not been expanded and continues to process only about two-thirds of the non-recyclable fraction of the municipal waste stream. Overall, the solid waste management system has not developed into a complete public system capable of measuring and managing all of the waste generated in Dutchess County.

As a result, the County now faces issues in recycling and waste-to-energy that are nearly identical to the issues presented 17 years ago.

B. Waste Volumes & Characteristics

1. County Characteristics

Dutchess County is a large land area (802 square miles) comprised of two (2) cities, eight (8) villages and 20 towns. The County is characterized by urban centers, extensive and growing suburban areas, and large areas of rural and agriculture uses.

In general, the population is concentrated in the corridor along the Hudson River, predominantly in Hyde Park, Poughkeepsie, Beacon, and communities to the south.

The United States Census 2007 estimate of the Dutchess County population is 292,746. Unlike most Upstate New York communities, the County has experienced a population growth of approximately 14% since 1990. Most notably, in that same period, the populations of the Towns of Beekman, Pawling and East Fishkill have increased by 30%, 26% and 15%, respectively. During the same period, on a County-wide basis, the number of households has increased by approximately 19%. The number of occupied housing units is estimated in the 2007 Census at 112,110.

Major employers in Dutchess County include:

- IBM
- Central Hudson Gas & Electric
- Saint Frances Hospital & Health Center
- Vassar Brothers Medical Center
- NYS Correctional facilities
- GAP Distribution

Colleges:

- Dutchess Community College
- Marist College
- Vassar College
- Bard College
- Culinary Institute of America

TABLE 2

EMPLOYMENT BY SECTOR

Sector	Number Units	Number Employees	Percent Employment
1. Agriculture	107	606	<1%
2. Construction/Mining	1,253	5,978	5%
3. Manufacturing	213	13,093	11%
4. Information	141	1,935	2%
5. Services	2,916	22,691	20%
6. Transportation/Public Utilities	157	3,903	3%
7. Wholesale/Retail	1,346	16,071	14%
8. Fire	764	4,347	4%
9. Health	831	17,075	15%
10. Education	117	6,984	6%
11. Government	268	22,343	19%
12. Unclassified	147	144	<1%
TOTAL	8,260	115,170	100%
Source: NYS Department of Labor 2008			

2. Waste Profile

Since the opening of the RRF, the Agency has well-documented waste volumes received and processed at the Facility. Annual volumes for the past five (5) years are shown below:

TABLE 3

TONNAGE RECEIVED					
	2004	2005	2006	2007	2008
MSW Received	151,910	152,802	154,020	144,473	142,844

There are two (2) conditions which significantly impact the Agency's operation. First, to date, the only means to capture the volume of waste necessary to operate the RRF for optimum energy production has been an annual negotiation with private haulers to attempt to secure a specific volume commitment.

Large and available volumes of landfill disposal capacity have meant that haulers have numerous lower cost disposal alternatives. This, in turn, has diminished Dutchess County's ability to charge a tip fee necessary to cover all expenses and has forced the Agency to give preferential, volume-based discounts. Although a future increase in fuel prices will make long haul to landfills less attractive, the fact remains that there is still a large volume of landfill capacity available and landfill disposal fees will remain lower than the fees necessary to support waste-to-energy. Even after securing waste delivery commitments from private haulers, the schedule of waste deliveries over the course of the year, specifically low volumes in the winter months, means that the RRF still receives less than optimum volumes. Therefore, without a new means to control the volumes of waste, the Agency will continue to struggle to meet the optimum RRF throughput.

Second, the original decision to size the RRF smaller than what would be necessary to process all the MSW generated in Dutchess County means that it has not been possible to measure the volume of waste that is taken outside Dutchess County for disposal. Therefore, in order to adequately consider the full range of options available for the Agency's and the County's consideration, we have prepared an estimate of the total volume of MSW generated in Dutchess County.

Three (3) methods of evaluating total waste volumes were used; per-capita waste generation, per-household waste generation, and the ratio of residential MSW to commercial/industrial MSW. Information developed by the United States Environmental Protection Agency (EPA), the State Department of Environmental Conservation (DEC) and other comparable communities in New York State were evaluated. The information from the EPA is helpful but it reflects a nationwide average and, therefore, any distinct

regional differences will not be evident. Also, the EPA information is only as good as that data reported by the individual states and there is variability in the metrics among the states. The information from the DEC reflects significant variation in the metrics used by planning units and, therefore, should not be used without qualification.

In looking at this wide range of information, the best approach is to use data from communities where there is a high level of confidence in the accuracy,[7] as shown below:

TABLE 4

WASTE GENERATION

Community	T/P/Y	T/H/Y
Babylon	0.798	2.448
Fulton	0.946	2.383
Madison	0.561	1.544
Oneida-Herkimer	0.604	1.531
Onondaga	0.660	1.654
Smithtown	0.984	2.958
USA(EPA)	0.843	-
Average	0.771	2.086
T/P/Y = Tons Per Person Per Year T/H/Y = Tons Per Household Per Year		

Using the average indicated above, the total waste generated in Dutchess County would be in the range of 225,707 tons per year (using tons per person per year) to 233,861 tons per year (using tons per household per year). To further evaluate this calculation, the ratio of residential MSW to commercial/industrial/institutional MSW was considered. Based on examination of similar communities, it is estimated that

[7] The communities selected each have the capacity to receive all waste generated within their boundaries and have successfully employed flow control regulations to assure delivery over several years.

approximately 60% of the MSW generated in Dutchess County is residential with the remaining 40% coming from commercial/industrial/institutional sources.

Even though only reliable data was used, this estimate is not intended to be exact. Based on numerous factors, we believe that the total volume of MSW generated in Dutchess County is likely at the upper end of the three (3) totals shown above. In the future, there are likely to be continuing efforts to reduce the volume of non-recyclable waste. However, the effectiveness of these efforts remains to be seen, and Dutchess County may also continue to see population growth in the future. Therefore, if measures are taken to manage all MSW, the Agency should plan on a volume of approximately 250,000 tpy. These figures do not include wastewater treatment sludges or construction and demolition debris.

By implementing the recommendations herein, the Agency will take responsibility for all waste generated in the County and, in doing so, it can build a database documenting, for the first time, the volume of waste actually generated in the County. By the time decisions are required for commitments to new programs, new facilities and facility upgrades, the Agency will have reliable data that can be used to update the analyses performed in this report and that can serve as a basis for determining design, capacity and other factors.

3. Current Collection Practices

The collection of municipal solid waste is provided by a variety of methods in the County. A total of nine (9) municipalities (the Cities of Poughkeepsie and Beacon, and the Villages of Millerton, Millbrook, Pawling, Rhinebeck, Red Hook, Tivoli and Wappingers Falls) provide public collection either using municipal crews or competitively-bid contracts. This method of collection covers approximately 21% of the County population. In the other municipalities, service is provided by direct arrangements between haulers and homeowners or commercial/ industrial/institutional

establishments. Some residents rely on the extensive network of transfer stations listed below, although no data exists to reliably quantify the number of users.

Local City(c), Village(v), and Town(t) Transfer Stations/Drop-Off Locations

Amenia(t)	Poughkeepsie (c)
Beacon(c)	Poughkeepsie (t)
Clinton(t)	Poughkeepsie (DCRRA)
Dover(t)	Red Hook(v)
Hyde Park(t)	Rhinebeck(t)
LaGrange(t)	Stanford(t)
Milan (t)	Union Vale(t) & Beekman(t)
Pawling(t)	Wappingers Falls(v)
Pleasant Valley(t)	Washington(t)

Based on an estimated annual tonnage of 250,000 generated in the County, then approximately 60% or 150,000 tons per year can be classified as residential and the remaining 40% or 100,000 tons per year classified as commercial/industrial/ institutional. As noted above, approximately 21% of the 150,000 tpy of residential waste is publicly collected. This equates to 30,000 tons per year which is publicly collected. That means that approximately 220,000 tons per year (88%) is collected by private haulers.

Although there is no data to document the individual market share of the private haulers servicing the County, observation of containers distributed throughout the County reflects that Royal Carting is the biggest single private hauler. Agency staff concurs with this assessment based on its annual negotiation for the commitment of waste to the RRF. In 2008, Royal delivered 117,300 tons to the RRF and has committed to the delivery of 115,000 tons for 2009. Royal's deliveries over the past five (5) years are shown below.

TABLE 5

ROYAL CARTING DELIVERIES

	2004	2005	2006	2007	2008
Tons	115,608	112,247	113,571	114,450	117,300
Percent of Total	76%	74%	74%	79%	82%

This level of private collection and the absence of flow control make it difficult for the Agency to track recycling compliance and ensure optimum waste volumes for the RRF.

C. Financial Structure

The operation of the Dutchess County solid waste management system is currently funded principally by fees charged by the Agency for use of its facilities and by energy revenues, and secondarily by the payment by Dutchess County of a Net Service Fee. A summary of the operating budgets showing expense categories and revenue sources for 2005-2009 is shown below.

TABLE 6

SUMMARY OF EXPENSES & REVENUES

EXPENSES	2006 ACTUAL	2007 ACTUAL	2008 ACTUAL	2009 BUDGET
1. Personnel & Administration	713,208	622,615	685,851	890,879
2. Operations	964,013	1,006,827	868,894	1,132,388
3. Service Fees RRF	7,548,449	7,921,357	8,186,375	8,583,012
4. Service Fees MRF	250,000	250,000	250,000	265,225
5. Pass-Throughs RRF	1,996,947	2,132,984	2,293,981	2,525,750
6. Residue Disposal	2,008,476	1,874,464	2,396,626	3,617,453
7. Debt Service	4,328,606	4,420,647	4,481,588	4,532,096
8. Reserves	48,024	27,368	0	477,405
TOTAL EXPENSES	17,857,723	18,256,262	19,163,315	22,024,208
NON-FEE REVENUES				
1. Electric Sales RRF	3,172,587	3,533,291	4,213,284	2,910,600
2. Material Sales MRF	472,414	471,519	493,639	286,500
3. Interest Earnings	460,299	410,702	346,484	420,000
4. Total Non-Fee Revenues	4,105,300	4,415,512	5,053,407	3,617,100
REVENUES FROM FEES				
1. Tip Fees RRF	11,463,410	10,736,001	10,583,492	11,476,500
2. Tip Fees MRF	160,764	167,580	32,004	0
3. County Net Service Fee	2,124,528	2,921,279	3,496,200	6,930,608
4. Total Revenues From Fees	13,748,702	13,824,860	14,111,696	18,407,108
ADJUSTMENTS	3,721	15,890	-1,788	
TOTAL REVENUES	17,857,723	18,256,262	19,163,315	22,024,208
RRF TONS PROCESSED	154,020	144,473	142,844	154,000

1. Revenues

The DCRRA receives revenues from three (3) main sources: a) tipping fees from haulers and municipalities using the Facility; b) revenue from the sale of electricity to

Central Hudson Gas & Electric Co.; and c) Net Service Fees paid by Dutchess County pursuant to its Disposal Service Agreement with the Agency.

Tipping Fees - Tipping fee revenues at the RRF were $10,583,492.00 in 2008 (avg. $74.09/ton). Of these, $8,362,327.00 (79%) was paid by Royal Carting. The Agency's posted gate fee is $80.00/ton, but its primary source for waste and tipping fees is an agreement with Royal, under which the County's largest hauler has agreed to deliver at least 115,000 tons of waste per year for a discounted rate of $73.75 per ton. The fee paid is a negotiated rate, based upon alternative costs of disposal that would otherwise be available to Royal at out-of-County landfills and other facilities. Royal operates in Ulster, Putnam, Westchester, Orange and Rockland Counties, in addition to Dutchess. Royal operates two (2) transfer stations in Dutchess County, and regularly utilizes at least five (5) other disposal facilities for the waste it collects. The tonnage delivered to the RRF each year is a rough approximation of the amount collected by the company in Dutchess County, but the company is under no obligation to deliver waste to the RRF, except pursuant to its annual agreement with the Agency.

Other users of the Facility include the City of Poughkeepsie and several small haulers. Waste Management of New York also collects waste within Dutchess County, but disposes of relatively little waste at the RRF, as it operates a transfer station in Kingston, Ulster County, and transports much of its waste to a Waste Management landfill in Perinton, New York (High Acres).

Under current circumstances, the amount that the DCRRA may charge as a tipping fee at the RRF must be competitive with costs for alternate disposal in order to attract business from haulers such as Royal. Costs in the market for waste disposal are established by two (2) elements: landfill tipping fees and transportation costs. Currently, landfill tip fees are quite low (in the $20.00-$30.00/ton range in western New York), due to an abundance of capacity and a highly competitive market for reduced amounts of waste. The economic downturn of 2007-present has led to a reduction in waste generation and heightened competition between disposal facilities.

Transportation costs are also currently low, as the cost of diesel fuel has dropped from 2008 levels.

Commercial haulers are able to quickly take advantage of lower cost alternatives. From 2006 to the present, Agency revenue from tipping fees has fallen from $11.4 million (2006) to $10.9 million (2007) to $10.5 million (2008). If Agency gate rates and its contract rate with Royal do not adjust to prevailing market costs for transportation and disposal of solid waste, less waste and revenue can be expected at the RRF as long as alternate disposal costs do not increase. In the long run, Agency fees and tipping revenues can only increase as the cost of disposal and transportation increase. Of these two (2) components, the cost of transportation is greater than the cost of disposal at distant landfills, and more volatile. However, we estimate that the cost of transporting and disposing of a ton of waste generated in Dutchess County is currently less than $70.00/ton, and it is unlikely that the DCRRA could secure a higher tipping fee than it now receives from Royal, or any other commercial hauler, absent an increase in the cost of fuel, or the reduction of available disposal capacity at landfills in the northeastern United States.

Electric Revenue - The second major source of revenue for the RRF comes from the sale of electricity to Central Hudson Gas & Electric. Unlike tipping fee revenue, revenue from the sale of electric power has been trending upward in recent years. The DCRRA sells electric power to Central Hudson under a long-term contract that guarantees a floor price of $0.06 per KWh, plus additional payments reflecting the avoided cost to Central Hudson if it had to purchase an equal amount of power from another independent power producer. Assuming an average energy production of 48.3 million KWh for export to Central Hudson in a given year, the DCRRA could expect to receive $2.9 million in electric revenue annually, based on the $0.06/KWh floor price. Actual revenue from the sale of electric energy, including avoided cost revenue, was $2.93 million in 2004, $3.84 million in 2005, $3.17 million in 2006, $3.53 million in 2007 and $4.21 million in 2008, an increase of 43.6% over five (5) years. Expressed as a

percentage of total Agency revenues, electric revenues from the RRF constituted 18.9% of revenue in 2004, 23.8% in 2005, 17.8% in 2006, 19.3% in 2007 and 21.6% in 2008.

As noted, the energy recovery technology employed in the RRF was designed to provide for steam sales to IBM. The loss of that steam customer left the Agency with only one option – the production of electricity. If designed solely for production of electricity in the first instance, a more efficient turbine design would have been employed and production and revenues would have been higher.

Future revenues for the DCRRA from the sale of electric power will be dependent on many factors, including demand, transmission costs and the cost of fuel consumed for power generating purposes. Deregulation of electric markets has produced an active market in the purchase and sale of electric power through the New York Independent Systems Operator (NYISO), the market used to determine the avoided costs paid to the Agency by Central Hudson. In New York, prices paid to independent power generators differ by region, with lower Hudson Valley generators generally procuring the third highest rates in New York, after Long Island and New York City. In general, market prices for power have historically trended along with natural gas prices, and are influenced by sharp increases and declines in petroleum prices as well. The significant increase in electric revenues received by the Agency in 2005 and 2008 coincided with spikes in oil prices occurring in the peak demand season of spring and summer of those years.

Because of current reduction in demand and greatly reduced pricing for oil and natural gas compared to 2008, we do not expect that the Agency will duplicate its 2008 electric sales revenue in 2009. However, we believe it is reasonable to assume that electric power prices will remain above the $0.06 floor. Despite the economic downturn in New York State since the fall of 2008, NYISO still forecasts a net increase (less than 1%) in power demand for 2009. Regulatory initiatives, such as the Northeastern Regional Greenhouse Gas Initiative (REGGI) and proposed cap-and-trade or carbon-tax legislation at the federal level, will, if implemented, gradually increase the cost of fossil

fuels used in power generation, and thereby increase demand, and the prices paid, for non-fossil fuel sources, including energy from waste. Revenues from energy sales would also benefit from the inclusion of waste-to-energy in the New York's renewable energy portfolio, as has been done in 23 other states.

This report does not attempt to forecast the rate of increase in electric power revenues for the Agency. However, we believe that the cost of fossil fuels in both the power and transportation sectors will increase from present levels. Because electric prices have historically been linked to the price of fossil fuel, as the cost of fossil fuel increases, the price paid for electric energy, including energy generated from solid waste, should also rise. Consequently, we believe that avoided cost revenues from the sale of electric energy will increase over time and should provide a growing portion of the Agency's revenue in the future. We also note that increases in the cost of petroleum will impact the cost of transportation for long distance disposal of solid waste, and may have a dual effect on the Agency's future budgets, not only increasing revenue from the generation of power, but allowing increases in the tipping fee as the cost of long distance disposal approaches the cost of local disposal at the RRF.

Net Service Fee - The third major source of revenue for the DCRRA is the Net Service Fee paid by the County to close any budget gap between the Agency's expenses and its revenue from all sources. Budgeted and actual Net Service Fee payments by the County for 2004-2008 are shown below:

TABLE 7

NET SERVICE FEE

	2004	2005	2006	2007	2008
Budget	$1,878,296.00	$2,254,000.00	$4,146,494.00	$4,067,394.00	$5,715,363.00
Actual	$1,450,123.00	$1,242,302.00	$2,123,528.00	$2,921,279.00	$3,496,200.00

The steady increase in the County's Net Service Fee correlates directly with the Agency's inability to increase tipping fee revenues from haulers when forced to compete with other disposal facilities (primarily large private landfills) in a competitive market. Net Service Fee payments would have been higher in each of the years 2004-2008, but for the increases in electric revenues. The sole annual decline in the Net Service Fee over this period, in 2005, coincided with both slightly higher tonnages at the RRF (152,000 tpy v. 151,000 in 2004 and 2006) and higher energy revenues for that year. Steeper increases in Net Service Fee payments in 2007 and 2008 correspond with declines in tonnage and tipping fee revenue in those years: 144,473 tons and $11.4 million in 2007; 142,844 tons and $10.5 million in 2008.

The Net Service Fee can be expected to decline in 2015 when $18 million in Agency debt is retired and debt service payments are reduced from $4.5 to $1.67 million per year. Over the long term, the Net Service Fee may decline further as long haul disposal costs rise and allow the Agency to attract more waste at a competitive tip fee. Similarly, rising electric revenues may also help close the gap over the long term.

However, we believe that in order to shrink or eliminate the Net Service Fee payments made by the County to the DCRRA in the short term, the Agency must a) increase the tonnage of MSW processed at the RRF; b) increase the tipping fee for MSW processed at the RRF; and c) increase the amount of electric energy generated and sold to Central Hudson Gas & Electric. These objectives can be accomplished through the re-establishment of flow control legislation in the County, and over a longer term, the undertaking of capital improvements at the RRF, including the replacement of the existing turbine generator with a more efficient turbine of greater capacity, and ultimately the expansion of the RRF to provide a newer, more efficient boiler train capable of accepting all the MSW generated in the County. The means of accomplishing these objectives will be discussed in Part II.

2. Expenditures

For 2009, of the total system expenses, $14,726,215.00 or 67% is directly related to the operations of the RRF and residue disposal [Note: Ash is disposed of at four (4) landfills at a cost for transportation and disposal of approximately $48.00 per ton]; $4,532,096.00 or 21% is for debt service; and the remaining $2,765,897.00 or 12% is for operation of the MRF, the HHW program and all other system management.

Expenses related to the operation of the RRF are established by a contract with Montenay-Dutchess and by competitive procurement. The annual debt service expense comes from two (2) bond issues. Significantly, and as shown in Table 8 below, the original RRF bonds will be retired on January 1, 2014 or in January 2013 if the Agency applies the debt service reserve fund which has been maintained over the life of the bonds. This will eliminate an annual expense of approximately $3.8 million.

TABLE 8

DEBT SERVICE SCHEDULE

	Existing Debt Service			*Series 2007 Bonds*			
Date	Principal	Interest	Total	Principal	Interest	Total	Debt Service
1/1/2008	$2,650,000.00	$568,680.00	$3,218,680.00	-	-	-	$3,218,680.00
1/1/2009	$2,785,000.00	$1,004,860.00	$3,789,860.00	-	$839,592.95	$839,592.95	$4,629,452.95
1/1/2010	$2,925,000.00	$864,457.50	$3,789,457.50	-	$742,637.50	$742,637.50	$4,532,095.00
1/1/2011	$3,075,000.00	$714,577.50	$3,789,577.50	-	$742,637.50	$742,637.50	$4,532,215.00
1/1/2012	$3,235,000.00	$553,140.00	$3,788,140.00	-	$742,637.50	$742,637.50	$4,530,777.50
1/1/2013	$3,410,000.00	$380,067.50	$3,790,067.50	-	$742,637.50	$742,637.50	$4,532,705.00
1/1/2014	$3,595,000.00	$195,927.50	$3,790,927.50	-	$742,637.50	$742,637.50	$4,533,565.00
1/1/2015	-	-	-	$925,000.00	$742,637.50	$1,667,637.50	$1,667,637.50
1/1/2016	-	-	-	$975,000.00	$696,387.50	$1,671,387.50	$1,671,387.50
1/1/2017	-	-	-	$1,020,000.00	$647,637.50	$1,667,637.50	$1,667,637.50
1/1/2018	-	-	-	$1,070,000.00	$596,637.50	$1,666,637.50	$1,666,637.50
1/1/2019	-	-	-	$1,125,000.00	$543,137.50	$1,668,137.50	$1,668,137.50
1/1/2020	-	-	-	$1,180,000.00	$486,887.50	$1,666,887.50	$1,666,887.50
1/1/2021	-	-	-	$1,230,000.00	$436,737.50	$1,666,737.50	$1,666,737.50
1/1/2022	-	-	-	$1,285,000.00	$384,462.50	$1,669,462.50	$1,669,462.50
1/1/2023	-	-	-	$1,340,000.00	$329,850.00	$1,669,850.00	$1,669,850.00
1/1/2024	-	-	-	$1,400,000.00	$269,550.00	$1,669,550.00	$1,669,550.00
1/1/2025	-	-	-	$1,465,000.00	$206,550.00	$1,671,550.00	$1,671,550.00
1/1/2026	-	-	-	$1,530,000.00	$140,625.00	$1,670,625.00	$1,670,625.00
1/1/2027	-	-	-	$1,595,000.00	$ 71,775.00	$1,666,775.00	$1,666,775.00
	$21,675,000.00	$4,281,710.00	$25,956,710.00	$16,140,000.00	$10,105,655.45	$26,245,655.45	$52,202,365.45

The continued operation of the RRF and initiatives to maintain a viable system compliant with changing regulatory requirements and new services to meet public demand will require capital reinvestment in the future. Implementation of the recommendations herein would either require the issuance of new bonds and/or the establishment of reserves to fund the new facilities and improvements. A capital budget plan can be initiated so that investments over a five to ten year period can be identified and a funding method secured.

Our initial recommendation to fund a capital budget plan is to earmark revenue from the proposed Green Fee. Initially, the projects in Table 9 would be funded over the course of five (5) years by annual appropriations to designated reserves. The capital budget planning process will allow the Agency to select the best timing, from a finance perspective, to implement each project. For example, if new bonds are required they could be issued to coincide with the retirement of the original RRF bonds in 2014 (which relieves an annual debt service expense of $3.8 million). The dollar amounts shown in Table 9 reflect information from similar projects recently done in other areas, however, they are set forth here are for planning purposes only and do not reflect the cost of property acquisition (where applicable), engineering, design or finance costs.

TABLE 9

RECOMMENDED FUTURE CAPITAL PROJECTS

- Permanent Household Hazardous Waste Facility - $500,000.00
- Single-Stream Materials Recovery Facility
  (This capital cost will vary from $0 if the Facility is developed by a private company to an estimated $10-13 million if a new Facility is developed by the Agency on a new site)
- RRF Turbine Retro-fit - $3,000,000.00
- Other long-term RRF upgrades to be determined by diagnostic study

D. Economic Outlook

1. Economics of RRF Operations and the Net Service Fee

The amount of the Net Service Fee paid by the County to the Agency each year represents the difference between the net cost of all Agency operations, after consideration of all other Agency revenues, including revenues received from the sale of electric power and from tipping fees. As discussed above, the amount that the Agency can charge a local hauler or municipality is limited by the market price for transportation and landfill disposal otherwise available to those haulers. If the Agency's fee is greater than the hauler's all-in cost for transport and disposal of MSW at an out-of-county or out-of-state landfill, the hauler will have no incentive to deliver any waste to the Agency's Facility. So long as out-of-County disposal fees remain low, the Agency's tipping fee must remain low to compete with other disposal options. If Agency revenues from tipping fees remain low, the Net Service Fee will remain high, unless revenues from the sale of electricity increase, or the costs of operating the Facility (including debt service) decline. Conversely, if the cost of long-haul disposal to distant landfills increases, the Agency's tipping fees may be increased to reflect market conditions. If the cost of long-haul disposal rises due to increases in the cost of fossil fuel, the rates paid to the Agency for the sale of electricity will also increase, and the Net Service Fee could be reduced due to increases in both revenue sources.

The operating costs of the RRF, including debt service, service fees to the contractor, and pass-through costs, were $121.52 per ton in 2008. This cost figure is net of electric and other revenues, but does not include the costs and revenues for the Material Recovery Facility or Agency administrative costs. Costs to operate the Dutchess RRF are higher than the costs that would accompany transport and disposal of Dutchess County waste at a commercial landfill under current market conditions.

2. Market Competition: Landfill and Transportation Costs

We have examined the current market for transport and disposal at landfills for waste generated in the southern part of New York State including Dutchess County. Pricing in the alternative landfill disposal market is driven by two (2) factors: cost of disposal (tip fees) and cost of transportation, which in turn is a function of distance and is heavily influenced by the cost of fuel. The object of our review was to determine the likelihood of a rise in the price of alternate disposal, and therefore, a potential increase in the Agency's tip fees and revenues, contributing to a decline in the Net Service Fee payments to the County.

We have examined the results of recent competitive bidding processes undertaken by municipalities in New York for disposal of MSW. In bidding undertaken by the Town of Brookhaven, on Long Island in 2008, proposals were accepted for the disposal of 250,000 tpy of municipal waste for a five to ten year term, employing any lawful means of disposal or transport. Respondents were asked to separately identify the costs of operating the Town's transfer station, transporting the waste to the point of disposal, and the tipping fee for acceptance of the waste at the disposal location. Six (6) bids were received, of which five (5) proposed landfill disposal at facilities in New York, Ohio and Virginia. One (1) bid was received from the Covanta waste-to-energy facility in Hempstead, New York. Fees for disposal only, exclusive of transport, were as follows:

TABLE 10

COMPARATIVE TIP FEES

Bidder	Facility Type & Location	Fee/Ton 5-yr Avg.
A	Landfill - Ohio	$22.85
B	Landfills (2) - Ohio, PA	$31.53
C	Landfills (10) - NY, PA, VA, Ohio	$77.30 w/transport
D	Landfill - NY	$30.25
E	Landfills (2) - KY, WV	$20.03
F	WTE - Hempstead, NY	$77.80

Transportation costs and methods varied in the proposals submitted to Brookhaven. Both rail and truck transport, with waste packed in conventional trailers, sealed containers, bales and flat-bed trailers were proposed. Ultimately, due to transport considerations, proximity, past history and the commitment of ash residue tonnage to Brookhaven's landfill, the Town selected the WTE facility located within a 40-mile driving distance.

Landfill tip fee pricing is not currently restrained by a lack of capacity at landfills within reasonable distance of Dutchess County. In a study of available capacity for long-term disposal of New York City waste conducted by the NYC Department of Sanitation in 2004[8], the consultants found that of 282 surveyed landfills in the Northeast, Mid-Atlantic and Midwest, 28 "mega-landfills" had available capacity in excess of 1,000 tons per day. Of these, 12 were located within 400 miles of the City of New York. The study found that sufficient available capacity existed to meet the needs of the City, but that much of this capacity was located at distances in excess of 250 miles. Tipping fees charged for spot market waste in landfills 400 miles or more from the City averaged $31.10/ton in 2003 dollars. Other results of municipal procurements in 2008 suggest that landfill tip fees in New York are competitive with these rates. We have also contacted municipal officials in the Town of North Hempstead, Long Island, and the Ulster County Resource Recovery Agency, who have also procured disposal pricing from the market in recent months. Both report available landfill tip fee pricing in the $20.00-$30.00/ton range offered to Brookhaven.

Current economic conditions have had the effect of depressing market rates for disposal at landfills. Reduction in the total amount of economic activity, including consumer consumption and slow-downs in the construction industry, have reduced the amount of waste generated in communities that have traditionally managed all waste generated within their boundaries.

[8] DSNY Commercial Waste Management Study Vol. IV, NYC Solid Waste Management Plan

TABLE 11

COMPARATIVE WASTE VOLUMES

	2006	2007	2008	% Change
Madison Cty, NY	52,430	53,833	49,647	-5.3%
Islip, NY (res)	187,367	179,684	172,626	-7.8%
Brookhaven, NY (res)	228,082	218,700	215,194	-5.6%
Babylon, NY (res)	n/a	90,321	84,413	-7.0%
Babylon, NY (comm)	n/a	92,502	90,588	-2.0%

The recent relative scarcity of waste entering the commercial marketplace has heightened competition among disposal facilities. We believe that economic recovery will produce a gradual increase in the amount of waste generated in the northeast, and that this will also contribute to a gradual rise in the cost of disposal at landfills within driving distance of Dutchess County. However, we believe that market tip fees for MSW disposal will remain relatively low for the near future.

Costs for transportation of MSW to landfills within one (1) day driving distance of Dutchess County are also low at the present time. The US Energy Information Agency reports that diesel fuel prices in the Central Atlantic region were $2.39/gal as of May 18, 2009, down 48% from a high of $4.91/gal in July of 2008. Diesel prices in May 2009 were at levels last seen in July 2005. The EIA, in its Annual Energy Outlook 2009, predicts national diesel prices to average $2.48/gal in 2010, and increase at rates of 1.4% per year to reach $4.00 again in 2030. The EIA, in preparing its annual forecasts, takes into account projections of the cost of crude oil, availability of reserves, developments in production technology and the growth of alternative fuel supplies, among other factors. The EIA projects only under current law, and does not take into account the effects of proposed legislation in the energy field, or legislation designed to address climate change, which may have a substantial effect on future fuel prices. In the absence of such changes to current law and policy, we conclude that fuel prices, and therefore, the overall cost of transport of waste within a range of 250 miles, will also remain relatively low.

3. Energy Revenues

The Agency's other primary revenue source, the sale of electricity, is supported by a floor price of $0.06./KWh in the Agency's agreement with Central Hudson Gas & Electric (CHG&E). This floor price has ensured a revenue averaging over $2.9 million per year from the Facility's average electrical output of 48.3 million KWh/yr. However, CHG&E is obligated to pay the Agency the avoided cost of electricity that CHG&E would have to purchase from other sources if the Facility was not on-line.

The avoided costs paid to the Agency have exceeded the floor price of $0.06 since 2005, producing higher electric revenues, as follows:

TABLE 12

ELECTRIC REVENUES

	2005	2006	2007	2008
Price Paid per KWh	$0.078	$0.064	$0.076	$0.095
Electric Revenue ($ million)	$3.84	$3.17	$3.53	$4.21

The increased avoided costs paid to the Agency from 2005 through 2008 are generally the result of increased demand for electric power, which rose 12.5% in New York in the period 1998-2008, and increases in the cost of fossil fuel, primarily the cost of oil and natural gas in New York State. The wholesale price of electricity generated in New York rose 64% during the period 2000-2008, with much of this increase occurring in 2005-2008.[9] If the annual increase in wholesale prices paid for electricity generated in New York were to continue to increase at similar rates, the electric revenue received by the Agency in another five (5) years would be $6.9 million, the amount of the budgeted 2009 Net Service Fee.

[9] NYISO *Power Trends 2009* pp. 9-10

Unfortunately, the current economic recession, reduced demand for electricity and low prices for fossil fuels indicates that Agency revenues from electric sales in 2008 will not be duplicated in 2009, and may not again exceed the $0.06/KWh floor price until 2010. NYISO reports that wholesale electric prices in April 2009 were the lowest since May 2002 at $0.3964/KWh, and were down from $0.7825 in January 2009. The EIA expects US electricity consumption to decline 0.8% in 2009 before rebounding to grow by 1.5% in 2010. NYISO forecasts New York electricity consumption to grow by less than 1% per year through 2019.[10] Given current conditions in the electric markets and on-going economic conditions, we cannot expect that past acceleration of the amount of electric revenues paid to the Agency will continue.

However, various legislative proposals before the US Congress could have a positive impact on electric revenues for the Agency. Waste-to-energy technology is currently included in the defined renewable energy portfolios of 23 states (although not in New York) and in the renewable energy portfolio contained in HR 2454, recently adopted by the House of Representatives. HR 2454 is a broad climate change measure that would introduce a national renewable energy portfolio, with mandatory requirements for the purchase of several specific types of renewable energy by local utilities. It would also introduce an economy-wide "cap-and-trade" system designed to reduce the generation of greenhouse gases and foster the trading of credits generated by facilities that produce power without generating GHG. Under HR 2454, WTE facilities would be exempt from any cap on GHG generation and could sell credits to entities that do produce GHG. Overall, the effects of the passage of a law drawn along the lines of HR 2454 may be expected to raise the price of energy generated from waste, and provide significant new revenue to the DCRRA from the continued operation of the Facility.

[10] NYISO *2009 Load and Capacity Data "Gold Book"* pp. 9-21

II. FINDINGS AND RECOMMENDATIONS FOR SYSTEM COMPONENTS

A. Long-Term Environmental Improvements

It has long been recognized that a comprehensive integrated solid waste management system is the best approach to achieve the highest levels of environmental protection to meet the service needs demanded by homeowners, businesses, industries and institutions, and to provide the fiscal stability important to the public, system managers and elected officials. In essence, an integrated system is one that manages the waste stream by its component parts, matching these parts to the best technology identified by the community being served, and (in terms of identifying proven and reliable technology), by solid waste engineers and scientists. An integrated system is one that uses a variety of programs and facilities aimed at the waste management hierarchy of waste prevention (reduction) followed by reuse, recycling, energy recovery and finally, landfilling of the materials which cannot be recovered. This replaces the outdated approach of trying to manage a complex amalgam of numerous elements comprising municipal solid waste by just a single, mass disposal option. Through a combination of coordinated facilities and programs, an integrated system maximizes material and energy recovery while minimizing waste that must be landfilled. Dutchess County has facilities and programs that comprise part of an integrated system and which can be enhanced in the future.

As a guide to how the integrated system can be improved in the future, we examined information from the USEPA, NYSDEC, and a variety of recognized trade organizations. As a matter of general principle, the greatest benefits come from the top of the solid waste hierarchy. Waste that is never produced [commonly referred to as waste reduction, waste prevention, source reduction] obviously creates no environmental impacts in terms of mining virgin materials for production, transportation, recovery and disposal, and there are no associated costs. Materials that can be recovered, processed and transformed into new products [recycled] have lower environmental impacts and costs by avoiding the use of new virgin materials. Materials that cannot be

recovered and recycled can still be beneficially reused through energy recovery which offsets the use of finite natural resources for energy production. All these present fewer environmental impacts and lower long-term costs than sending all the materials for landfill disposal.

For waste that is not reduced at the source or recycled, there are two (2) realistic and proven options -- waste-to-energy and landfill. The United States Environmental Protection Agency (EPA) has performed comparative studies of the emission of greenhouse gases (GHGs) from waste-to-energy facilities and landfills. Decomposition of solid waste in a landfill environment generates methane gas, generally considered to be 21 times more potent as a greenhouse gas than carbon dioxide (CO2). Comparing GHG emissions from a landfill equipped with an effective (75% capture) landfill gas control system and a corresponding Landfill Gas-to-Energy facility with GHG emissions from a waste-to-energy facility processing the same tonnage, EPA found that landfills generate two to six times the amount of GHGs as WTE facilities, while WTE is seven to eleven times more efficient at recovering energy from the wastes. WTE also generates less SO2 and NOx than LFGTE facilities.[11]

There have been efforts over the past 20 years to quantify the relative environmental impacts of various waste management alternatives and components to an integrated system. One such method, which is now widely recognized, was developed by the EPA using both the relative emissions of greenhouse gases (GHG) and consumption of energy to quantify the relative environmental benefits of alternative solid waste management programs and facilities. This method is the Waste Reduction Model (WARM).

[11] *Understanding the Energy Benefits from Materials and Discards Management,* S. Thornloe and O. Kaplan, EPA Office of Research and Development, May 7, 2009.

The WARM model was used to illustrate the relative environmental benefits, or more specifically the relative reduction in greenhouse gas emissions (GHG), for:

1. A landfill based system (all waste landfilled with 75% methane capture for landfill gas-to-energy (LFGTE))
2. The existing system (existing recycling levels and RRF at 92% capacity, balance of waste landfilled with 75% LFGTE)
3. An improved system (recycling increased to 35,000 tpy, 5,000 tpy composted, RRF at 100% capacity, balance landfilled with 75% LFGTE)
4. A new system (recycling increased to 45,000 tpy single stream, 5,000 tpy composted, RRF expanded with third boiler and 199,000 tpy capacity, balance landfilled with 75% LFGTE)

The tonnage inputs for each scenario along with the total change in GHG emissions for each scenario are shown in Table 13. The data inputs are attached as Appendix A.

TABLE 13

WARM MODEL SUMMARY

	1. Landfill Based System	2. Existing System	3. Improved System	4. New System
Reduction	x	x	x	2,000
Recycle	x	9,363	35,000	45,212
Compost	x	1,267	5,000	5,000
Waste-to-Energy	x	144,729	155,000	199,576
Landfill	260,630	105,271	65,630	8,842
Total Waste	260,630	260,630	260,630	260,630
GHG Emissions	21,205			
GHG Benefit		(31,341)	(58,772)	(73,094)

Notes: GHG – Greenhouse Gases (units are MTCE – Metric Tons of Carbon Equivalent). Negative numbers indicate a reduction in emission volumes; therefore, the larger the negative number the greater the environmental benefit.

Overall, the WARM analysis shows that Dutchess County has made significant strides in reducing greenhouse gas emissions compared to emissions from a landfill based system, removing approximately 31,341 tons of carbon equivalent from the environment per year. Perhaps more importantly, an 88% improvement in the reduction of greenhouse gases could be accomplished by improving recycling and composting coupled with increasing the throughput of the RRF by approximately 10,000 tons per year.

In looking to the future, by developing a new regional single stream materials recovery facility and by increasing the capacity of the RRF (and thereby reducing the County's dependence on landfilling) the Agency could more than double the reduction in greenhouse gas emissions compared to the existing system.

In addition to the direct greenhouse gas benefits, there are significant improvements in the overall energy consumption of the existing subsystem compared to a landfill based system. As shown in Table 14, energy use of a landfill system is estimated by the WARM model to be 92,454 million BTU's per year. The existing system utilizes 1,100,000 million BTUs less energy than a landfill based system. That reduction would be increased by 70% with improvements to recycling, composting and an increase in the RRF throughput of approximately 10,000 tons per year. Similar to the positive impact on greenhouse gas emissions, if a new system were built employing single stream recycling, more composting, and an RRF capacity of approximately 200,000 tons per year, the energy benefits would nearly double those of the existing system.

TABLE 14

WARM Estimated Energy Consumption

BTU's Per Year

1. Landfill Based System	92,545
2. Existing System	-1,131,140
3. Improved System	-1,925,640
4. New System	-2,397,716

B. Recycling and the Materials Recovery Facility (MRF)

Dutchess County made a major commitment to recycling with the adoption, in 1990, of Local Law #4 which mandates source separation and recycling. The Agency implemented this commitment with the opening of the MRF in December 1991.

1. Process and Technology

The MRF receives and processes commingled and presorted recyclable materials separated from the mixed municipal waste stream by County residents, and some businesses, industries and institutions. Collection vehicles deliver the recyclable materials to the MRF where each vehicle is weighed and the recyclable material is discharged on the tip floor. The MRF utilizes a series of conveyors and manual sorting stations. .The glass is crushed and conveyed into containers for shipment. Paper products are manually sorted according to what commodities and prices are in demand. The MRF is designed to accept and process a maximum of 73 tons per day of commingled recyclable materials

Local Law #4 of 1990 requires the source separation and recycling of the following materials:

Glass (all colors)	Magazines
Plastics (#1, #2, #3, #5, #7)	Corrugated Cardboard
Metal Containers	Office Paper
Aluminum Products	

The Agency also coordinates programs for the recovery of other recyclables such as appliances, tires, automotive batteries and electronics.

2. MRF Service Agreement

In November 1990, the Agency entered into the MRF Service Agreement with New England CR Inc. for the renovation of a County-owned building as a MRF and for the equipping and operation of the MRF for a period of five (5) years, which was renewed for an additional five-year term that expired in January 2002. In 2001, the Agency re-bid the MRF operations agreement, which resulted in a MRF Service Agreement with Hudson Baylor which terminated December 31, 2008, and has been extended on a month-to-month basis.

Materials, once processed, are marketed by Hudson Baylor, with the Agency receiving a percentage of the revenues. The Agency also receives the tip fees from the carters. The Agency pays Hudson Baylor a service fee of $250,000 per year.

The Agency exercised its option under the MRF Service Agreement to extend the contract with Hudson Baylor through 2008, and it is continuing on a month-to-month basis. Under this agreement, Hudson Baylor is obligated to accept up to 73 tons per day and process up to 365 tons per week of commingled recyclables at the MRF, to accept all delivered pre-sorted recyclables from within the County, and to market the recovered materials. Hudson Baylor is responsible for all expenses in regard to the operation and maintenance of the MRF, processing equipment, mobile equipment and general housekeeping. The Agency is responsible for providing roll-off containers for process rejects and for the hauling and disposal of the rejects. The MRF Operator is responsible for inspecting the delivered materials to detect and refuse any loads with more than 10% non-recyclables, for rejecting any hazardous waste and for assuring that the rejects contain no more than 10% of recyclable materials. The Agency permits Hudson Baylor to bring in recyclables generated outside Dutchess County, on a merchant basis and without cost to the Agency, because in-County volumes are low and the additional volume allows the contractor to optimize operation.

TABLE 15

RECYCLING PERFORMANCE

	2004	2005	2006	2007	2008
Tons Received	15,013	16,637	16,694	14,044	10,630
Material Sales	$209,373.00	$217,483.00	$472,414.00	$471,519.00	$493,639.00
Tip Fees	$136,515.00	$162,084.00	$160,764.00	$167,580.00	$ 32,004.00
Service Fee Payments	[$250,000.00]	[$250,000.00]	[$250,000.00]	[$250,000.00]	[$250,000.00]
Other Expense				[$ 12,079.00]	
Net Revenue/Expense	$ 95,888.00	$129,567.00	$ 383,128.00	$ 389,099.00	$275,641.00

In the October 2007 Official Statement for the Agency, bond refunding project engineer HDR (Henningson, Durham, Richardson Architecture & Engineering, P.C.) concluded that, "The MRF building is in need of substantial repairs...." If the Agency wants to improve and increase recycling in Dutchess County, it would be necessary to procure a Materials Recovery Facility which is both larger and more suitably equipped for increased volumes. Although the current MRF location is central, the available floor space is extremely limited and the size and configuration of walls and overhead doors creates limitations that would require demolition and reconstruction.

The Agency has expressed their intent to improve recycling in the County. Also, the State Department of Environmental Conservation is preparing a new State Solid Waste Management Plan and they are indicating it will include a new emphasis on recycling which they have characterized as plateauing in recent years.

In addition to traditional recyclables (glass, metal, plastics and paper products) the DEC is developing a new initiative to recover organics, principally food waste, from the municipal solid waste stream. They estimate that post-recycling MSW is comprised of approximately 19% food waste. The DEC characterizes this as the largest single remaining component and will make organics recovery a future priority.

3. Recommendation: Improve Recycling – Move Toward Single Stream

Although the County and the DCRRA made an early and major commitment to recycling, like nearly all communities and planning units in New York State recycling has reached a plateau and is, in fact, in some cases, faltering. In Dutchess County, the volume of recyclables delivered to the Agency MRF has dropped approximately 35% over the past three (3) years.

The State Department of Environmental Conservation has recognized the recycling plateau and is putting a new emphasis to improve recycling through increased participation, targeting commercial and institutional recyclables not currently being captured, encouraging the use of pay-as-you-throw programs, performance incentive programs, better public education, focus on public space recycling and in the final analysis enforcement.

In addition, over the past two (2) decades there has been an evolution in the methods of processing recyclables. Like most areas, Dutchess implemented a dual stream recycling system. A dual stream system requires the separation (at the point of generation) of paper recyclables (newspapers, magazines, cardboard, etc.) from container recyclables (cans, bottles, etc.). Over the past several years, the secondary materials processing industry has made major innovations that now allows all types of recyclables to be aggregated in one group -- commonly referred to as "single stream." This simply means that all the paper recyclables can be commingled with all the container recyclables at the point of generation.

We have contacted industry representatives and reviewed information on single stream materials recovery facilities in Phoenix, Arizona; Scottsdale, Arizona; San Antonio, Texas; and Liverpool, New York. There are a number of materials handling companies such as Besner, Bollegraf and Hudson Baylor (the Agency's current MRF operator) and solid waste/recyclables management companies (Allied, Recycle America/Waste Management, Inc., New England CRNC, Hudson Baylor) which have developed the

technology and equipment to a point that single stream MRFs can provide regular, reliable, and cost-effective recyclables processing capacity. It is worth noting that all facilities, both dual stream and single stream, continue to struggle with glass breakage and the associated contamination and difficult recovery. Also, the industry representatives indicate that it is preferable, and more cost-effective, to develop material recovery facilities with a capacity of at least 50,000 tons per year and preferably 90,000–100,000 tons per year. Based on discussions with industry representatives, it is estimated that a pre-existing building of suitable size could be equipped with modern single stream equipment for $6 - $7 million. A new fully equipped 50,000 square foot building would cost on the order of $12 - $13 million.

The benefits of a single stream recycling system are significant. First, it is easier and more convenient for homeowners as well as commercial generators -- all the recyclables can go in one set out bin. It makes public education more straightforward and a new public participation campaign coupled with the new level of convenience should increase participation and the volume of recyclables recovered. Of equal importance is the benefit to haulers. Single stream allows haulers to collect faster, to move to automated collection more easily, to potentially employ packer trucks for the collection of recyclables, and in some cases, to reduce the number of trucks needed. Single stream materials recovery facilities utilize a more automated system for processing recyclables, thereby reducing the number of sorters and the associated costs.

As noted previously, the existing Materials Recovery Facility in use to process recyclables from the County is limited in its capabilities. It is not well-suited to accommodate increased volumes which are likely in the future based on a renewed commitment to recycling by the DCRRA. Also, the existing Facility would not be easily adapted to new "single stream" equipment.

In order to achieve a significant improvement in recycling it will be necessary to develop a new materials recovery facility. We recommend that the Agency commit to the

development of a new, single stream facility. We also recommend that the Agency explore the feasibility of developing the materials recovery facility on a regional basis to capture the benefits of higher volumes and economies of scale. In considering the options available it should be emphasized that the feasibility and viability of a new, single stream facility will depend on commitments of a base volume of recyclable material to offset both the capital investment and annual operating expense. If the County and the Agency implement flow control over residential recyclables it will represent an estimated 35,000 to 45,000 tons per year, a good base volume. Depending on how the Agency procures a new facility (specifically, how the issue of recyclables from outside the County is handled), similar commitments from neighboring counties may be needed. Such a commitment from an intermunicipal partner could include sharing in a portion of the capital construction cost, but at a minimum it would have to include a firm commitment of a specific annual tonnage. From this point, the financial terms would have to be negotiated. While this would give the Agency the highest level of control, it would also create significant new responsibilities for siting, permitting, procurement/construction and operation.

Alternatively, the Agency could explore the possibility of a privately developed new single stream facility that would serve Dutchess and possibly other neighboring counties. As noted, this would require a firm commitment of a specific volume of recyclables. This option would be more attractive if the private party, and not the Agency, were to take responsibility for siting and development. However, one potential downside would be that without a commitment to a specific site in Dutchess County, there could be a significant haul distance to such a new private facility. Also, although the up front capital construction cost would be avoided, that cost would be reflected in the fee charged to use the facility.

We also examined the potential for the Agency to utilize the Ulster County Resource Recovery Agency (UCRRA) MRF, which is in close proximity to Dutchess County and which is currently underutilized. A partnership with Ulster could theoretically be negotiated to allow for the use of the UCRRA MRF in a relatively short time, possibly as

soon as 2010. However, the existing UCRRA MRF is a dual stream facility which limits the ultimate ability of Dutchess County haulers to implement the convenience of single stream collection and achieve significantly higher recycling rates. Therefore, the best long term approach would be for Dutchess County to develop its own facility.

It will be important that a coordinated public information and education be implemented. This will bring a renewed focus to recycling and should be aimed at getting residents to join the effort to separate recyclables from the waste stream and to make sure they are targeting all eligible recyclables. When the transition is made to single stream, there will be an additional significant opportunity to "spotlight" recycling coupled with new measures that will make it even easier for residents to participate.

C. Green Waste Composting

Green waste consists of leaves, brush, grass clippings and other garden waste that wholly consists of organic matter. Green waste is a traditional element of municipal solid waste and its volume has increased with suburban development through the last half of the 20th century. It has, for nearly 30 years, been targeted as a component that should be reduced and removed from the waste stream before the residual waste is processed for energy or landfilled. It can be readily managed through one of several composting options.

Related to green waste composting are efforts to recover other organics from the waste stream, principally food waste. In some cases, food waste can be combined with green waste in a single compost operation.

In Dutchess County, there are several green waste and/or food waste collection and recovery programs now underway.

Compost

City of Poughkeepsie
Bard College
Culinary Institute of America
Vassar College
Royal Carting
Tri-County Municipal Waste
McEnroe Organics

Green Waste Collection

Town of Poughkeepsie
Village of Rhinebeck
Town of Wappingers
Town of Washington
Lamela Sanitation
Royal Carting
Duffy Layton
IBM East Fishkill
IBM Poughkeepsie
Greenway Topsoil
Recycle Depot

It should be noted that reporting of green waste and food waste volumes is incomplete and inconsistent. At this time, based on a review of the information provided and available, it is estimated that approximately 1,200 tons per year of green waste and food waste is being recovered prior to incineration or landfilling.

In looking to the future, the Agency has a head start on food waste recovery with the ongoing diversion programs at the Culinary Institute of America, [which diverts over 600 tons per year of food waste for recovery by McEnroe Organics] Vassar College and Bard College. These initiatives are consistent with other public solid waste systems that are targeting institutional food preparation waste as the priority because it is more easily aggregated and kept free of contaminants. Experience gained with institutional food preparation waste can then be evaluated to estimate the feasibility of expanding to other generators and post-consumer waste streams.

The successful food waste composting programs at the Culinary Institute of America, Vassar College and Bard College can be used as models for other major institutions and potentially-commercial enterprises. It should be possible to reach a level of composting of 5,000 tons per year of green waste and food waste.

We recommend that Dutchess County define food preparation waste and post-consumer food waste generated at schools, colleges, health care facilities and other designated institutions, as a recyclable material. Where such food waste is separated from other municipal solid waste at its source, it will not be directed by the County for disposal. Like other recyclables generated by institutions, industries and businesses, it is recommended that there be a requirement to recycle food waste but the method of recycling would be left to the determination of the generator.

We also recommend that the DCRRA assist such generators by identifying existing food waste compost facilities which are in or near Dutchess County. For those generators where new on-site food waste composting equipment is determined preferable, the DCRRA may serve as a conduit for funding from the NYSDEC. For any program to be successful it will have to produce a consistent and reliable green waste/food waste product.

D. Household Hazardous Waste

Currently, the Agency provides an annual program of eight (8) collection events for household hazardous waste (HHW) which consists of paints, solvents, pesticides, herbicides, pool chemicals, photographic chemicals, batteries, mercury switches, florescent bulbs, and a wide-range of electronic items. Expansion to include pharmaceuticals is being considered. The removal of these materials is of a particular benefit to Dutchess County because it will reduce the input, and therefore, emissions of heavy metals such as mercury and lead from the RRF. The sponsorship of eight (8) collection events is a major commitment by the Agency and it also reflects how highly-valued the service is by the residents of Dutchess County.

The Agency's management of HHW is consistent with current State policy and in the future product stewardship legislation [currently proposed for electronics] may provide a source of funding for the Agency. Currently, the Agency allocates $128,750.00 per year for household hazardous waste management.

In the future, the Agency could consider expanding and improving its HHW program through the siting and construction of a permanent Facility, at a central location, that would be open at least during the good weather months to receive HHW from Dutchess County residents. Ideally, the HHW would be collocated with the new MRF to take advantage of staffing and oversight. The HHW Facility would provide for the receipt of materials under controlled conditions and the segregation and storage of household hazardous wastes in compliant, explosion-proof units. By aggregating quantities of these materials, the transport and disposal can be done more efficiently and at a lower unit cost.

Based on an examination of HHW facilities developed by other communities, it is estimated that the capital cost for a new HHW Facility would be on the order of $450,000.00–$500,000.00. However, there would also be a significant annual operating expense to provide and train the staff to receive, separate, manifest, and pack the household hazardous waste in the secure storage units.

E. Resource Recovery Facility

1. Overview

In 1984, the DCRRA and the County of Dutchess elected to pursue the conversion of solid waste into energy as their primary means of managing the County's solid waste stream. The Resource Recovery Facility, constructed between 1985-87, was not sized large enough to accept all of the waste generated in the County, and growth in the population and volume of waste in Dutchess in the years since, have reduced the fraction of County waste that the Facility can accept and process. The balance of the

MSW generated in the County has been handled by private sector haulers, recyclers and transfer station operators throughout this period.

In its 20 years of operation, the RRF has accepted and processed over 3 million tons of waste, and generated over 860,000 MWh of electric power. The choice of waste-to-energy over landfilling as the disposal method for the region, was consistent with the established disposal hierarchy (reduce, recycle, recover energy, landfill) of both the US EPA and the State of New York. From an environmental perspective, the RRF has yielded significant benefits, particularly when compared to the environmental impacts that would have occurred if the 3 million tons processed had been consigned to landfill disposal.

2. History

The DCRRA Resource Recovery Facility, located at 96 Sand Dock Road, Poughkeepsie, New York, was constructed by Pennsylvania Resource Systems, Inc., a wholly-owned subsidiary of Pennsylvania Engineering Corporation (PEC) under a contract with the Agency dated December 1, 1984. The Facility began start-up and performance testing in 1987 and was accepted by the Agency for full operations in June 1989. In 1988, with the approval of the Agency, the rights to operate the Facility were transferred by PEC to Westinghouse Electric Corporation, the owner of the O'Connor Combustion System, which had been licensed to PEC and installed in the DCRRA Facility. Westinghouse operated the Facility for ten (10) years and in 1998, the rights to operate the Facility were again transferred with the approval of the Agency, to Montenay Dutchess LLC ("Montenay"), a wholly-owned subsidiary of Veolia ES Resource Recovery Inc.

The RRA was financed by the sale, in 1984, of $40 million in revenue bonds of the Agency, plus a grant contribution by the State of New York of $13,449,000.00 in Environmental Quality Bond Act funds. Pursuant to its authorizing statute, bond indenture agreements, a Service Agreement with the operator of the Facility, and a

Solid Waste Disposal Service Agreement (the "Disposal Agreement") with the County of Dutchess, the DCCRA is obligated to pay its debt service obligations to bond holders, its operating expenses for the Facility, and all other Agency costs through the collection of tipping fees for use of the Facility, revenues from the sale of energy, steam and recyclable materials, accrued interest on funds and other revenues of the Agency.

Pursuant to the Disposal Agreement with the County, the DCRRA is obligated to provide (or cause the contractor to provide) disposal service for a minimum of 140,000 tons of waste per year. The Disposal Agreement obligates the County to cause the delivery of 140,000 tons of waste per year (the "Guaranteed Annual Tonnage") and to pay, if necessary, a Net Service Fee to the DCRRA. The Net Service Fee is calculated as the amount necessary to pay the balance of all outstanding DCRRA costs, after application of all available DCRRA revenues, in any given year.

3. Design

The Resource Recovery Facility is a "mass burn" design, equipped with two (2) O'Connor rotary waterwall combustors, each rated at a maximum capacity of 256 tons per day (tpd), and collectively permitted to operate at an annual average of 450 tpd. The Facility was designed to accommodate the future construction of a third combustor and boiler train, which remains an option for the Agency, and is discussed further below. The Facility produces steam which is used to generate electric power through a 9.2 MW turbine generator, and can be made available for direct sale for use as a heating source. During the period 1989 through 1998, steam was generated and sold for use at the IBM South Road complex, but in 1998, the sale of steam was discontinued and is not expected to be resumed.

The loss of the Facility's steam sales customer represented a net loss in the efficiency of the Facility, as the installed 9.2 MW turbine generator was not designed to convert the full steam production from the Facility into electricity. In 1985, following its agreement with the DCRRA, PEC designed an identical Facility with a 12 MW turbine

generator for the Islip Resource Recovery Agency, in an agreement that did not contemplate the sale of steam. The current turbine at the RRF must be considered undersized, and the energy in steam generation at the Facility underutilized, if steam sales to third parties cannot be resumed.

In 2005, significant capital improvements were made to the Facility to comply with final Emission Guidelines issued by the US EPA for existing small waste combustion units. In order to comply with the new guidelines, the DCRRA installed several new components to the Facility's air pollution control system, including a new spray dryer absorber for control of sulfur dioxide and hydrogen chloride, a new carbon injection system for the control of mercury, and upgrade of the air handling system to improve baghouse performance, and an upgrade of the continuous emission monitoring system. These improvements were financed through the issuance of $14,800,000.00 in Bond Anticipation Renewal Notes in 2005, and $16,140,000.00 in new DCRRA system bonds (the "2007 Bonds") to retire these notes at maturity.

4. Performance

In a Consulting Engineer's Report dated October 19, 2007, prepared in connection with the issuance of the 2007 Bonds, the Agency's engineer, Henningson Durham & Richardson Architects and Engineers (HDR) found that the RRF was in good operating condition with no major operating deficiencies identified. HDR concluded that the useful life of the Facility can be expected to exceed the term of the 2007 Bonds (2027) if operated and maintained in accordance with the Service Agreement and accepted industry practice. Specifically, HDR found that it is reasonable to conclude that the Facility could continue to meet its Performance Guarantees, including annual throughput (140,000 tpy), operational availability (85%), steam generation (4.8 klb/ton), and electric power generation (46,000,000 KWh/yr), if properly operated and maintained.

The environmental performance of the Facility has been well within its permitted limits. The Facility's Title V Air Permit was amended by the NYSDEC to incorporate stricter standards promulgated by the EPA in 40 CFR 60 subpart BBBB. In stack tests following installation of the capital improvements funded by the 2007 Bonds, the Facility emitted no more than 18% of allowable particulate matter, 41% of allowable SO2, 78% of allowable NOX, 7% of allowable dioxins and 5% of allowable metals. The installed air pollution controls yielded reductions of over 88% in emissions of sulfur dioxide, 92% of hydrogen chloride and 94% of mercury.

The combustion process at the Facility produces approximately 50,000 tons of ash residue from the combustion of approximately 150,000 tons of MSW. This amount of residue is higher than the anticipated reduction of MSW to 25% by weight projected in the original design and contract with PEC. The performance of the Facility in this respect is identical to that of its sister Facility in Islip, New York, and is generally attributable to the O'Connor design, although ash weights have also increased due to the addition of reagents and moisture absorption from the improved air pollution control system. Under the Service Agreement, as amended in 1998 at the time of the assignment of operating rights to Montenay, the DCRRA is responsible for the cost of ash disposal up to 33.3% of the amount of MSW processed, with the contractor being responsible for any additional costs. The ash handling system at the Facility recovers from 5,000 to 8,500 tons of ferrous metal from the ash annually, representing 30-33% of the ash stream by weight.

Ash residue is positively used as an alternative daily cover under Beneficial Use Determinations (BUDs, granted by the New York State Department of Environmental Conservation) at four (4) landfills: Madison County, Steuben County, Ontario County and Delaware County.

5. Costs

Costs for the operation of the RRF consist of four (4) major components: base service fee and expenses to the operator, pass-through costs, debt service and residue disposal costs. Actual operating expenses for 2008 totaled $17,358,570.00 on throughput of 142,844 tons, or $121.52 per ton. The payments by the Agency to the operator, the base service fee and pass-throughs, are set forth in the operating agreement. Residue disposal costs are established by competitive bid and are paid directly by the Agency as are debt service expenses.

The base fee paid to the operator of the Facility was initially set at $34.50/ton with the assignment to Westinghouse in 1988. It has since been escalated with inflation and specific cost indices as established in the operating agreement. In addition, the DCRRA compensates the operator for additional expenses related to operation of new air pollution control systems ($750,000.00/yr or $5.20 per ton), shares the net electric revenue generated at the Facility (at a rate of 15% up to 140,000 tons of MSW processed and 50% beyond the throughput guarantee), and pays additional bonuses and revenue based upon operating performance. Total fees and revenue sharing with the operator in 2008 were $8,186,275.00 or $57.30 per ton.

The DCRRA is responsible for the payment of a variety of direct costs for the Facility, including a contribution to an equipment repair and replacement fund, insurance premiums, air pollution control materials and monitoring, fuel and other expenses. Pass-through costs for 2008 totaled $2,293,981.00 or $16.05 per ton.

Debt service payments in 2008 totaled $4,481,588.00 or $31.37 per ton. As a result of the issuance of the 2007 Bonds, the total debt owed by the DCRRA for repayment of the initial 1984 bonds and the 2007 Bonds is $32,380,000.00, after payment of the 2009 obligation. The Agency's debt service obligations will be approximately $4,500,000.00 per year from 2010 through 2014. In 2015, these payments will decrease to $1,667,000.00 per year as the initial bond obligation is satisfied.

The cost of disposal of ash residue from the Facility includes disposal fees and transportation costs. Each of the participating landfills (Madison, Steuben, Ontario and Delaware counties) accepts the ash from the RRF under Beneficial Use Determinations made by the NYSDEC, which allow the ash to be used as cover material, and not characterized as waste. The DCRRA also accounts for costs associated with its Household Hazardous Waste program and other disposal expenses under its residue disposal budget line. In 2008, the total cost for residue transport and disposal was $2,396,626.00 or $47.93 per ton of residue. Residue disposal as a function of tons of MSW processed was $16.77 per ton for 2008.

We have examined the contractual obligations of the DCRRA with Montenay Dutchess, as well as the Agency's ash disposal agreement with Regional Waste Solutions Inc., and the facilities used for ash disposal, and we find no immediately apparent opportunity for renegotiation or savings. The cost of the Service Agreement with Montenay is in line with the best comparable Facility of the same size, also a PEC designed, 486 tpd O'Connor combustor Facility, in Islip, New York. The facilities were both built in the 1986-89 period, are both operated under contract with Montenay, and have both been improved with MACT air pollution control technology in the 2005-2007period.

A comparison of the major components in the cost of operation of the Dutchess RRF and the Islip RRF for the years 2006 through 2008, are set forth below. We have broken out the common costs for both facilities, and excluded certain costs incurred by Islip for the transfer of excess waste that are not incurred by Dutchess.[12]

[12] The "tons processed" figures for the DCRRA are the reported figures from the Facility operator and reflect the amount of waste actually processed during the calendar year, and are not identical to the tonnage received over the Agency's scales during the same calendar year. "Tons processed" figures for the IRRA facility are conservatively stated as the maximum annual facility capacity for purposes of comparison.

TABLE 16

COMPARISON TO ISLIP

Item	2006 DCRRA	2006 IRRA	2007 DCRRA	2007 IRRA	2008 DCRRA	2008 IRRA
Base Service Fee & Operating Cost	$ 7,548,549	7,921,152	7,921,357	7,621,610	8,186,375	8,119,933
Pass-through and Other Costs	$ 1,996,947	3,867,637	2,132,984	4,191,720	2,293,981	3,960,760
Ash Disposal	$ 1,788,465	3,276,176	1,936,407	3,398,523	2,396,626	3,456,973
Debt Service	$ 4,420,467	5,967,765	4,328,606	5,503,365	4,481,588	5,758,530
Total	$15,754,428	21,032,730	16,319,354	21,715,218	17,358,570	21,296,196
Tons Processed	146,059	164,000	145,923	164,000	143,618	164,000
Total per/ton	$ 107.86	$ 128.24	$ 111.83	$ 126.31	$ 120.86	$ 129.85

We note that in the above table, Debt Service for both entities includes capital costs for facilities other than the Resource Recovery Facilities owned by each entity. In the DCRRA's case, cost of the MRF is included, and in the case of the IRRA costs for a MRF, compost facility and landfill are included.

We note also that while the cost of operating the IRRA's Facility is generally higher than the cost of operating the Dutchess Facility, Islip's revenue base is more stable than that of the DCRRA. Islip processes a guaranteed waste steam collected by haulers under contract with the Town of Islip, and also accepts commercial waste at a market tip fee. Consequently, disposal costs can be passed through to homeowners as a benefit assessment in the cost of collection service, and the available supply of waste allows full capacity operation. In addition, the Islip Facility generates more electric power per year due to its larger turbine, and also receives higher electric revenues per KWh, due to the higher avoided costs for electricity on Long Island. Overall, Islip receives approximately $1 million more in energy revenue per year than the Dutchess RRF.

6. Long-Term Maintenance and Operational Improvements for the RRF

The US EPA has recognized the successful implementation of Maximum Achievable Control Technology (MACT) at the 86 WTE facilities in the United States. MACT improvements were installed in the Dutchess RRF in 2005. As a result of MACT, EPA has stated that WTE now produces electric power with less environmental impact than almost any other source of electricity.[13] In an assessment of the performance of 167 large and 60 small municipal waste combustion units dated August 10, 2007, EPA's Office of Air Quality Planning and Standards characterized MACT performance in WTE facilities as "outstanding" and noted that dioxin/furan emissions had been reduced by 99% from 1990 levels. Emissions of lead were reduced by 97%, emissions of mercury, cadmium and particulates by 96%, hydrogen chloride by 94%, SO2 by 88% and NOx by 24%. As noted above, the results for the Dutchess Facility in stack tests conducted after MACT installation were consistent with the national averages, and emission reduction standards consistent with the stack tests have been added to the Facility's Title V Air Permit by NYSDEC.

The American Society of Mechanical Engineers (ASME) estimates that every ton of MSW processed in an American WTE Facility avoids the importation of one (1) barrel of oil and the mining of 1/3 of a ton of coal for the production of equivalent energy. ASME also finds that US WTE facilities recover approximately 770,000 tons/yr of post-source separation metals from processed MSW, and that taking all avoided use of fossil fuel into account, the processing of one (1) ton of MSW in a WTE Facility results in a net reduction of CO2 emissions of as much as 1.3 tons.[14]

Application of the ASME estimates to the operating history of the Dutchess RRF, indicates that the Facility has avoided the consumption of 3 million barrels of oil or 1 million tons of coal over its lifetime, and also avoided the emission of 3.9 million tons of CO2. Coupled with the significant reduction of emissions of dioxins, metals,

[13] Letter from Marianne Holinko and Jeffrey Holmstead, assistant EPA administrators for the Offices of Solid Waste and Air, to Marie Zannes, president IWSA February 14, 2003.
[14] ASME *White Paper: Waste --to-Energy: A Renewable Energy Source from Municipal Solid Waste* 2008

particulates, SO2 and NOx brought about by the recent air pollution control improvements at the Facility, the environmental benefits of the operation of the RRF have been significant. The DCRRA's consulting engineer, HDR, concluded in its 2007 assessment of Facility performance that the Facility, if maintained in accordance with the Service Agreement and industry standards, will have a useful life extending beyond 2027, the date of the maturity of the 2007 Bonds. As a result, we believe that the DCRRA should continue to operate the Facility, taking several actions to assure proper maintenance and potential improvements in performance and economic efficiency, discussed below.

Currently, the Facility is approaching its 20th anniversary of performance acceptance. Over this period, equipment and components have been repaired and replaced in a manner sufficient to achieve the relevant Performance Guarantees contained in the Service Agreement. However, the current Service Agreement with Montenay Dutchess (a division of Veolia) will expire in June 2014, and prior to that date, the DCRRA will have to procure a new operating contract for the Facility, through competitive bidding under General Municipal Law §120-w. In preparation for that procurement, the DCRRA should undertake a full engineering assessment of the condition of the Facility, and prepare an estimate of the major components and equipment which will need refurbishment or replacement to assure continued reliable operation for the ensuing 20 to 25 years. Such an assessment will allow the DCRRA to provide for capital improvements when needed, and will provide prospective bidders for the post-2014 Service Agreement with technical information necessary to submit an informed proposal.

We have interviewed management personnel at Veolia Environmental SA with respect to the condition of the Facility and their interest in proposing on a follow-up Service Agreement. Veolia indicated that it would perform a "Life Extension Analysis" of the Facility within the final five (5) years of the current agreement in order to determine the need for major and minor overhauls of equipment, their probable cost, and the time frame in which they will be necessary. We have also interviewed the management of

the Islip Resource Recovery Agency (IRRA), which owns a very similar Facility, also designed and built by PEC and operated by Veolia. IRRA requested Veolia to perform an analysis of the Islip Facility in connection with a proposed extension of the IRRA-Montenay Service Agreement from 2010 through 2015. The IRRA also directed its engineer, HDR, to perform a parallel analysis, and to evaluate the findings of the Veolia study against its own, to inform the IRRA's decision on extending the Service Agreement.

Both studies at Islip focused on the expected useful life of various Facility components, including cranes, fans, pumps, ram feeds and hydraulic drives, boiler tubes, economizers, turbine generator, air pollution control equipment and instruments, and other items. Each major component was evaluated as to the necessity of major repair or replacement within periods of five, ten and over ten years. Estimates of approximate cost, in current dollars, were calculated. As a result, the IRRA was presented with largely consistent, detailed analyses estimating that capital improvements totaling between $20 million (Veolia) and $25 million (HDR) would be needed at various points over the next 20 years of operations to continue satisfactory performance.

We recommend that the DCRRA pursue a similar course. Veolia should be requested to expedite its planned review, and the Agency's engineer should be engaged to assess the condition of the Facility with a view toward extending its useful life through 2030 and beyond. The results of these reviews can be used by the Agency Board to plan future work and expenditure, and should be made available to prospective bidders in the procurement for an operating contract after 2014.

We note that a result of the parallel studies performed by Veolia and HDR for the IRRA in 2008, was a decision by the IRRA to pursue a potential expansion of the Islip Facility. In December 2008, elected officials of the Town of Islip and the neighboring Town of Brookhaven announced their intention to engage in discussions to provide an additional 750 tpd of capacity at the IRRA Facility for Brookhaven residential waste, and the reservation of capacity at the Town of Brookhaven landfill for ash residues of the

expanded Facility. We discuss the potential for expansion of the Dutchess Facility below.

7. Specific Facility Improvements

Turbine Upgrade – While the progress of new legislation affecting the economics of WTE facilities should be closely followed, the efficient capture of electric energy from waste processed at the RRF, will remain important even if current law and regulation remain unchanged. We believe that the Agency should evaluate the potential for an increase in its operating efficiency and net revenues through the replacement or retro-fit of its current turbine generator with a larger, more efficient unit. As noted above, the original design of the RRF intended that a significant fraction of the steam generated from the combustion of MSW would be sold directly to a steam customer located off-site. As a result, the turbine installed at the RRF was not designed to recover energy from all of the steam generated. The termination of the original steam sale left the RRF without the capacity to efficiently produce additional electric power for sale.

We have contacted officials at Islip, New York, which is investigating the rehabilitation of its existing 12MW turbine with new internal components capable of generating up to 15 MW at a cost of approximately $6 million. Islip estimates that the increase in turbine capacity could allow the sale of up to 3,000,000 additional KWh per year.

We have also contacted the Facility manager of the Montenay-operated, 700 tpd waste-to-energy Facility of Charleston, South Carolina, which is considering a retro-fit of its existing turbine. The Charleston Facility, designed and built by Foster-Wheeler, was configured to generate steam for sale to a neighboring US navy base, as well as to power a turbine to generate electricity. In the mid-1990s the Navy base closed, although the Navy continued to honor its steam purchase contract, which expires in 2010. Like the Dutchess Facility, the Charleston Facility extracts approximately 310 KWh/ton of waste processed. In a proposal under consideration by Montenay and Charleston County, the Facility's 12.5 MW turbine would be fitted with new interior

components in its exiting shell. The turbine manufacturer, Dresser-Rand, proposes a retro-fit that would increase the amount of energy recovered from each ton of waste from 310 KWh to 440 KWh at a cost of approximately $7 million. Montenay estimates that the turbine upgrade would provide an additional $1.8 million per year in revenue, and would pay for itself within four (4) years.

Montenay's plant staff at Dutchess estimates that a similar retro-fit to the existing RRF turbine generator would cost approximately $3 million. For capital budget planning purposes we recommend building a reserve of $4 million over five (5) years. In addition, the replacement of existing 125 and 250 hp fans with more energy-efficient models could reduce plant power consumption significantly. If the efficiency of energy recovery from the combustion of waste at the Dutchess RRF could be increased from its present 315 KWh/ton to 440 KWh/ton, electric generation from 150,000 tons would increase to 66 million KWh/yr from 48 million, and would provide an increase in revenue from electric power sales of approximately $1.2 million per year at $0.06 per KWh.

It should be stressed that engineering estimates should be performed to determine the actual amount of increased power available for sale that a replacement or retro-fit of the RRF turbine could provide. Comparisons with other facilities and other improvements are of limited value unless Facility conditions, other related equipment, and local power sale contracts are understood and considered. We have not performed such an evaluation. However, we recommend that the potential benefits of a turbine replacement or retro-fit be examined against the cost and feasibility of making such an improvement.

Facility Expansion – We also believe that the Agency should explore the cost and feasibility of expanding the RRF to accommodate the balance of the waste generated in Dutchess County that remains after improvements in the region's recycling infrastructure are implemented. At present, we estimate that there is an additional 95,000 tons/yr of processible MSW that is currently handled by private haulers and delivered to out-of-county landfills. We believe that a sizeable fraction of this amount

can be recovered and recycled through improved source separation. If 33% of this amount can be recovered for recycling, over 60,000 tons will remain, and can be directed to the RRF through flow control legislation. We believe that for environmental and economic reasons, this tonnage should be processed to recover energy rather than be landfilled.

Currently, WTE Facility expansions are being planned or constructed at Lee County, Florida; Hillsborough County, Florida; Honolulu, Hawaii; York, Pennsylvania; Olmsted, Minnesota; Hempstead, New York; Islip, New York and Harford County, Maryland. The size and costs of these expansions vary. Comparisons of costs per ton of new capacity reveal a wide range of variation, reflecting differences in design, site restrictions and other local conditions. In general, the costs are significant. Examples are $193,000.00 per design ton at Lee County, Florida to $233,000.00 per design ton at Hillsborough County Florida, both of which are approximately 700 tpd expansions currently under construction. In New York, neither Covanta Energy Hempstead nor the Islip Resource Recovery Agency has publicly announced costs for the expansions of their respective facilities. Studies performed for the Montgomery-Otsego-Schoharie Solid Waste Authority (MOSA) have estimated costs at $225,000.00 per design/ton. We have no reason to believe that costs for an expansion of the Dutchess RRF would be different.

While expansion of the RRF would require a significant capital investment by the Agency, we believe that the long-term waste disposal needs of the region require that it be seriously considered. First, the ability of the Agency to continue to emphasize recycling and recover energy from non-recyclable waste, will require a comprehensive system, capable of meeting the waste disposal needs of all of Dutchess County. Expansion of the RRF will be a more feasible, and environmentally-superior option than developing a new MSW landfill within the County. Second, the ability of the private sector to provide low-cost landfill disposal for the balance of the waste generated in Dutchess County for the next 25 to 30 is far from clear. Disposal costs over the past 20-year period have been volatile, and costs will be subject to regulatory and economic forces in the future. Third, environmental and regulatory considerations argue strongly

for waste-to-energy as a superior method of management in terms of minimizing both conventional pollutants and greenhouse gases. Fourth, responsible energy policy argues for the use of waste as a renewable energy resource, likely to increase in value for the generation of power as national policy discourages the use of fossil fuels in coming years.

Many technical issues require examination before an expansion can be fully evaluated. These issues will necessarily include questions as to the expected useful life of various components of the existing Facility, and the amount of capital investment that will be required to perform major rehabilitation or replacements over the next 25 years. We believe that such an examination should be conducted, and its results made available to the public, in preparation for the procurement process for future operation of the Facility. The current operations agreement with Montenay Dutchess will expire on June 30, 2014. A procurement for a new operator will open for negotiation, all issues of operation, maintenance, revenue sharing and capital construction of major and minor improvements to the RRF over the term of the new agreement. The Agency should make its own thorough evaluation of the condition and potential of the Facility, not only to assist prospective bidders in their assessments, but to evaluate the merits of the proposals made by firms interested in assuming responsibility for the Facility after June 2014. Sufficient time should be afforded in the procurement process to allow bidders to conduct a thorough evaluation of the RRF, to formulate and propose the terms of operation, revenue sharing and capital responsibility, and to negotiate the terms of a new agreement.

In our view, the procurement process should be commenced in early 2012, to allow at least 30 months for preparation and analysis of proposals, to conduct negotiations and to identify and address any environmental concerns that may be relevant. The importance of the procurement process cannot be understated. For this reason, the Agency should undertake its own evaluation of the Facility as soon as possible, so as to be fully informed with respect to the issues involved. From this process, the Agency

can inform itself and the County of the opportunities that may be secured from capital investment by a new operator, or from the Agency itself.

F. Landfill

At the outset of the creation of the Agency and when the decision was made to move forward with the development of the RRF in 1984, several potential landfill sites in Dutchess County had been identified and reviewed under the State Environmental Quality Review Act ("SEQRA"). According to the Final Solid Waste Management Plan For Dutchess County (February 1992), the Agency intended to acquire the rights to use an existing permitted landfill located in the Town of Fishkill for the disposal of ash residue, non-processible and bypass waste. The Agency had also entered into an option agreement for the purchase of an adjacent 124-acre parcel for future expansion.

Following this, operating problems were experienced at the existing landfill and the DEC determined that the site was underlain by a primary groundwater aquifer. The application for renewal of the landfill permit was subsequently denied by the DEC and the Agency discontinued its efforts to permit and acquire the site.

The 1992 Plan, however, indicated the Agency's intent to continue to pursue the development of an ash landfill facility and it projected the landfill to be open and operational by 1995. Subsequently, the Agency and the County made a decision not to pursue the development of a local ash landfill.

The absence of a local ash landfill owned by the Agency means that the County continues to depend on competitive bids for the transport and disposal of ash residue at landfills outside the County, and in fact, at significant distance from the County. Obtaining an adequate number of competitive bids has not been a problem and, as discussed in this report, the current disposal market is reflecting the downturn in the overall economy resulting in an excess of landfill capacity and associated low prices.

Although very recent increases in the cost of fuel have occurred, the cost of transport and disposal is still relatively low.

Ideally, the Agency should have its own ash landfill. Although it might be equal in cost to the current cost of export, it would stabilize costs over the long term and eliminate the risk of price hikes due to fuel increases and a constriction in disposal capacity. However, the identification and evaluation of potential sites, completion of the SEQRA and permitting processes, and the ultimate development of a new landfill, represents an enormous undertaking that must be backed by an unwavering policy commitment and willingness to commit substantial funds for many years before the facility can open. As a frame of reference, the Oneida–Herkimer Solid Waste Authority spent over 12 years and $13 million to complete the SEQRA and permitting process and another three (3) years and $31 million to build the newest landfill in New York State. The landfill is a 1,000 ton per day, 250,000 ton per year facility.

We recommend the Agency Board of Directors consider the potential for starting the process to develop its own landfill after implementing the upgrades to the system in the areas of recycling, composting, household hazardous waste and the Resource Recovery Facility. In the future, with the status of the available capacity in contract landfills unknown, it could be important for the Agency to have a local option.

G. Transition: Establish Multiple, Convenient Locations For Waste Delivery

As noted above, we estimate that up to 250,000 tons per year of MSW is generated in Dutchess County each year (not including sludge and construction/demolition debris). With optimum operations, the RRF will consume 155,000 tons per year leaving a residual of approximately 95,000 tons per year.

To insure a consistent and comprehensive solid waste management program that is fully capable of inspecting and insuring that recyclable material is removed from the MSW, that items constituting HHW are removed from the MSW, and that there is

uniform compliance with other applicable environmental standards, we recommend that Dutchess County take responsibility for the disposition of the residual MSW that cannot be handled at the RRF. In addition to the noted environmental and compliance benefits, by careful procurement of a disposal facility, the DCRRA can minimize risk of future environmental claims that often arise from substandard disposal facility construction or operation. (At least one (1) major private hauler based in Dutchess County has been targeted in litigation to recover post-closure costs at landfill facilities.)

Dutchess is a large and geographically diverse County. Although there is an extensive network of municipal transfer stations, none appear suitable to upscale so they could receive significantly-increased waste volumes.

Based on the large geographic area and the diverse character of Dutchess County, it will be necessary to provide new, conveniently-located transfer stations to serve private and public haulers in all areas of the County. The RRF is and should continue to be the primary designated location for delivery and discharge of solid waste. This priority designation must be done to insure optimum volumes for efficient plant operation and maximum energy recovery. Based on our review of land use and the road network in the County, we believe that two (2) additional transfer stations should be procured to serve the northern and southern parts of the County. In the north, the Ulster County Resource Recovery Agency transfer station in Kingston could provide the service necessary. In the south, a new or existing facility would have to be secured through a competitive RFP. The operation of the two new transfer stations and the new priority designation of the RRF should be evaluated on an ongoing basis and adjustments should be made to reflect the actual waste volumes delivered as well as the haulers' experience with travel times. To accomplish the best balance and to insure that convenient service is provided adjustments should be made as necessary to the service areas of the transfer stations and the RRF. It may be possible that a third new transfer station will be needed to serve the large rural area in the eastern portion of the County, which is separated from the population corridor by a limited highway network and the Taconic Mountains and the Hudson Highlands Range.

It is envisioned that the expanded transfer station approach would require a dispatch function to insure that optimum volumes are taken to the RRF. In fact, the RRF itself can serve as a transfer station with the excess waste not used for energy recovery (plus the ash residue) being sent to a contract landfill for disposal. This approach would continue until the RRF is expanded, at which time all haulers could be dispatched directly to the RRF.

Specifically, we are recommending the establishment of three (3) locations for the delivery of waste by municipalities and commercial haulers as follows:

1. RRF - The first priority for MSW generated in Dutchess County will be delivery to the DCRRA-RRF, Sand Dock Road, Poughkeepsie. The pattern of waste deliveries and operation of the RRF would essentially follow what has been done by the Agency in recent years. One important difference is that during low waste periods, additional waste would be directed to the RRF to insure continuous optimal operation. Additional waste generated in close proximity would be directed to the RRF to increase convenience and lower transportation expenses for haulers. Residual waste volumes not needed for the RRF will either be transported to the UCRRA transfer station in Kingston, or directly to the contract disposal facility. On a preliminary basis, it is projected that the RRF would serve Poughkeepsie, LaGrange, Union Vale, Hyde Park, Pleasant Valley, Washington and Amenia.

2. New Northern Transfer Station - It is recommended that the DCRRA negotiate an inter-municipal agreement with the UCRRA for the transfer and disposal of residual waste to a contract disposal Facility. This will benefit both Counties by creating a critical mass of 175,000 to 200,000 tons per year of MSW that should attract volume pricing in a market-bid situation. Also, it will take advantage of the existing UCRRA transfer station in Kingston and will eliminate the current loss of waste from the northern section. In negotiating an inter-municipal agreement, it is recommended that the DCRRA insist on the following provisions:

a. The first priority for MSW generated in Dutchess County will be delivery to the RRF.

b. No guarantee of a minimum daily, monthly or annual waste volume should be made. The agreement should be a commitment to deliver all waste received after the volume necessary for the RRF is satisfied. The commitment by Dutchess County to enact and enforce flow control should serve as an adequate pledge for both Ulster and the prospective disposal facilities.

c. The RFP to secure a disposal Facility (after the current contract expires) should include a requirement for an environmental indemnification of Dutchess County and the DCRRA by the disposal Facility.

d. Provision should be made to allow the award to more than one (1) disposal Facility; and specific terms should be included for the use, through an inter-municipal agreement, of a public disposal Facility.

3. New Southern Transfer Station – It is recommended that a transfer station capability be secured in the Southern part of the County to take deliveries from public and private haulers in that area. This would be accomplished through a competitive RFP process. Waste received at this location will either be transported to the UCRRA transfer station in Kingston or directly to the contract disposal Facility. On a preliminary basis, it is projected that the Southern Transfer Station would serve Fishkill, Wappinger (part), East Fishkill, Beekman, Pawling and Dover.

H. Flow Control

A central purpose of this report, as set forth in the Agency's Request for Proposals, is to assess "the advisability of re-implementing solid waste flow control in Dutchess County as a primary means of minimizing the County's financial support of the Dutchess County

Resource Recovery Agency (DCRRA) while assuring environmentally sound and low-cost waste disposal to County residents."

1. Nature and Uses of Flow Control

The term "flow control" is a short-hand reference to state or local laws that direct the flow of waste generated in a given area to specific disposal facilities, transfer stations, recycling facilities or solid waste systems that are designated by the government. Flow control laws are typically applied to generators of solid waste, and to persons or businesses that collect waste within the jurisdiction of the municipality adopting the law. The law can identify specific fractions of the waste stream, such as recyclable or compostable material, construction and demolition debris, and non-recyclable municipal solid waste, and direct each fraction to a facility appropriate for its disposition.

Flow control is a management tool for local government that can provide several different benefits. For a municipality that has elected to provide disposal or recycling service to its residents and businesses, and has invested capital in the construction and operation of solid waste facilities, flow control laws can regulate collection of waste in a manner that ensures that proper material goes to each facility, that environmental risks are minimized, that recycling and source separation laws are effectively enforced, and that the costs of the facilities can be recovered through fees charged according to the amount of waste delivered.

Flow control laws were widespread in the United States in the 1980s, and their use was frequently relied upon by purchasers of municipal bonds for solid waste facilities, particularly where the primary source of repayment was the anticipated revenue expected from the payment of disposal or "tipping" fees by users of the new facility. Local legislatures, in determining to build a new disposal facility with taxpayers' funds for taxpayers' waste, adopted laws directing local waste to the facility so that sufficient revenues could be derived to operate the facility and repay the bonds. The use of revenue financing was attractive for two (2) reasons. It was equitable in distributing the

cost of the facility proportionately among those who generated solid waste, and it established a funding source independent of ad valorem property taxation. In 1984, Dutchess County adopted a flow control law to direct waste generated in Dutchess to the resource recovery facility planned for construction.

2. Legal Challenges to Flow Control

In the 1990s, flow control laws began to be challenged in the courts by private waste disposal and collection companies who claimed injury for loss of business due to enforcement of the laws. In 1994, the United States Supreme Court, in *C&A Carbone v. Town of Clarkstown*, declared that a flow control law adopted by the Town of Clarkstown, New York, violated the commerce clause of the constitution. The Court found that the Clarkstown law impermissibly favored the local facility designated to receive the town's waste, and discriminated against facilities located in other states that were prohibited from competing with that facility. The *Carbone* decision prompted many similar challenges to flow control laws in other jurisdictions. Many laws were declared unconstitutional in the years that followed, and many municipalities, including Dutchess County, suspended enforcement of their laws to avoid challenges.

One result of the loss of the ability to enforce flow control by municipalities was a loss of waste at municipal facilities. Private haulers and disposal companies developed the ability to haul waste long distances to landfills with low tip fees. Because most municipal waste systems provided recycling and other programs that did not necessarily generate revenue, municipal fees for the disposal of non-recyclable waste were frequently higher than fees charged for simple transport and disposal of waste to distant landfills. Local waste haulers, looking for the lowest price available, began diverting waste away from municipal facilities, in favor of other options. This occurred in Dutchess County, and in many other New York municipalities.

The DCRRA, carrying fixed capital and operating costs for the resource recovery facility and the materials recovery facility, could not expect to attract sufficient tonnage to fully

utilize its facilities without a reduction in its tipping fee. But by reducing its tipping fee to levels that were competitive with the market cost to transport and dispose at out-of-County landfills, the DCRRA could no longer operate solely on revenues derived from tip fees. As a result, the Agency called upon the County for annual payments of the "Net Service Fee," which make up the difference between the Agency's costs and its revenues from all other sources. Because market rates for long distance transport and disposal of waste have remained low in recent years, the Agency's tipping fee has also remained low. But because the Agency's costs have risen, the Net Service Fee contribution by the County has also risen.

The experience of the DCRRA and the County was common to many other municipalities throughout New York and other states. Many resorted to "economic flow control," in the form of subsidized tip fees, to attract local waste to local municipal systems. The outcome was inequitable, as the beneficiaries of the low landfill fees in other jurisdictions were those who generated, or collected, large quantities of waste, while those who paid for the subsidies were household taxpayers. For these reasons, some municipalities continued to defend challenges to their flow control laws in the courts. As the purposes and benefits of flow control came to be more clearly understood by the courts, municipal defendants began to have greater success.

In 2007, the Supreme Court returned to the subject, upholding the flow control laws of Oneida and Herkimer Counties in *United Haulers Association v. Oneida-Herkimer Solid Waste Management Authority*. In *United Haulers*, the Court distinguished the laws and waste system presented by Oneida and Herkimer Counties from the situation presented in *Carbone*. The court ruled that flow control laws that benefit publicly-owned facilities, and bar all private facilities, regardless of their location, from access to local waste, do not discriminate against interstate commerce. The Court distinguished *Carbone* because Clarkstown's law favored a local private facility over other private competitors. Under the rule articulated in *United Haulers*, flow control laws favoring public facilities are to be evaluated under a more lenient standard, balancing the public benefits of the laws against the incidental burdens they may impose on interstate commerce.

Significantly, the Court found that revenue generated by the laws, with or without additional environmental and public health benefits, is a legitimate public benefit to weigh in the balance against burdens on interstate commerce.

Carbone was limited, but not overruled by *United Haulers*. It remains good law, and would prohibit municipalities from adopting laws that favor local private facilities over out-of-state competitors. It is also significant that *United Haulers* did not attempt to define a "public" facility, except to recognize that all of the facilities operated by the Oneida-Herkimer Authority were owned by the public agency, even though private contractors were employed to perform tasks such as transport and disposal. How the courts may view a public-private partnership in a solid waste facility, where both entities share an ownership interest, remains to be seen. Overall, despite leaving some potentially troublesome issues unresolved, the *United Haulers'* court strongly endorsed flow control when used in support of public systems. Chief Justice Roberts, writing for the majority, cautioned lower courts against using the commerce clause to substitute the judgment of the court for the judgment of the local legislature in matters of economic policy.

3. Application of Flow Control to Dutchess County

The question presented for this report is whether it is advisable to re-implement solid waste flow control in Dutchess County "as a primary means of minimizing the County's financial support of the Dutchess County Resource Recovery Agency (DCRRA) while assuring environmentally sound and low-cost waste disposal to County residents." In order to address this question, we must consider both practical and legal issues in the current and prospective operations of the DCRRA.

Currently the DCRRA operates two (2) facilities: the Resource Recovery Facility (RRF) and the Materials Recovery Facility (MRF). Both are publicly owned, meeting the basic criteria for application of a more lenient "balancing test" standard under *United Haulers*. However, both facilities have limited capacity. The RRF can be expected to process no

more than 164,000 tpy out of the approximate 250,000 tons of processible waste estimated to be generated in the County each year. The MRF can potentially process approximately 19,000 tons of recyclables each year, but we estimate that 35,000 to 45,000 tons of recyclable materials could be extracted from the waste stream through source separation each year. If flow control were adopted and the law directed all of the processible non-recyclable waste to the RRF, and all of the source separated recyclables left curbside to the MRF, neither facility could accommodate the tonnage.

We have considered the application of a flow control law that directs only a portion of the waste stream to the RRF and the MRF. The waste stream could be divided geographically, with all waste and recyclables in a particular area, or group of towns, directed to the RRF or MRF, and the remainder allowed to utilize private or other public disposal service. We have also considered an administrative system whereby each local hauler, and each constituent municipality, would be directed to deliver a percentage of the waste it collects in the County to the RRF or the MRF, and authorized to deliver the balance to another disposal service.

Aside from any legal or constitutional concerns, we find that a "partial flow control" option holds very limited benefit to the Agency and the County. The primary benefit would be the certainty that both the RRF and the MRF would receive all of the tonnage needed to maximize operations at each facility. While certainty of operational capacity is a tangible benefit, it does not solve the financial problem facing the Agency.

The Net Service Fee could be eliminated under a partial flow control system, but this would require that the tip fees charged at the RRF be increased to reflect all DCRRA costs. Assuming an annual throughput of 150,000 tpy, the fee to fully support the Agency's 2009 budget would be $127.00 per ton. In a partial system based on geography, the area subject to flow control would pay $127.00/ton, while areas not subject to flow control would pay considerably less. We can find no principled way to identify which areas of the County should be subject to the higher fee and which should not.

In a partial system where each constituent municipality and each hauler were obliged to send a percentage (est. 66%) of their waste to the RRF, some customers might be charged the full $127.00 and some much less, or all would be charged a blended rate, approximating an average between the Agency fee and the market rates then available. A "blended rate" approach would eliminate County subsidy of the tip fee, but it would still sharply increase disposal costs to consumers, and would be difficult to administer. It would require oversight of hauler billing practices to establish an equitable common rate, in addition to enforcement of limits on the amount of waste that private haulers could send out-of-County. In addition, a fractional obligation would still tend to place a greater burden on municipal programs, such as the City of Poughkeepsie, which directs all of its waste to the RRF and has no capability for transferring waste for long-distance disposal elsewhere. The City, and the other municipalities that currently supply the RRF with 20% of its tonnage, would not benefit. We do not believe that a "partial flow control" system would be either administratively practical or financially beneficial.

Flow control would be best employed in support of a County policy to manage all of the general categories of non-recyclable MSW and residential recyclables, consistent with the County Solid Waste Management Plan. As discussed elsewhere in this report, our recommendation is that the Agency provides short-term transfer capability to manage waste and recyclables in excess of the capacity of the RRF and the MRF. In the longer term, the Agency should develop a larger, modern single stream MRF and increase the efficiency and then the capacity of the RRF.

4. Enforcement of a New Flow Control Law in Dutchess County

In adopting any flow control legislation, the legislature should identify and articulate why it is needed, and the environmental, fiscal and administrative objectives it is intended to achieve. Its application should be even-handed and should avoid placing greater burdens on any individual generator, hauler, or other participant in the waste markets than are placed on all such persons. We suggest that flow control legislation be used to expand and improve the environmental services provided by the Agency to all of the

County's residents and businesses, while gradually eliminating the annual payment of the Net Service Fee.

The core of any flow control law is a directive to haulers and municipalities collecting waste in the County to deliver that waste to designated public facilities. The facilities designated should be those established as part of the County's Plan for the management of the waste stream. The mechanism to assure compliance with the law should be based upon the County's existing licensing regulations. Essentially, the law should provide that the hauler comply with the County's solid waste code, including its flow control provisions, under penalty of loss of license.

Flow control systems successfully adopted elsewhere in New York, including the Counties of Madison, Onondaga, Oswego, Franklin, Oneida and Herkimer, as well as the Long Island Towns of Islip, Smithtown and North Hempstead, operate on this paradigm. Because the law requires a commercial hauler to obtain and hold a license to conduct its business, the potential loss of that license for a code violation is a more powerful incentive to comply with the code than a series of fines or penalties would be. Because the license is the key element, the code can be enforced administratively and not as a criminal statute.

There are significant advantages to an administrative, rather than a judicial enforcement system. A system enforceable in the courts, particularly in the criminal courts if violations are designated as misdemeanors, would necessarily add a heightened level of process, commensurate with the potential loss of liberty inherent in a criminal statute. In addition, the violation would enter a system already burdened with much other business, much of which may involve more serious crimes. In the environment of the criminal court, the resolution of flow control enforcement cases cannot be given priority over other matters.

An administrative system would not carry criminal liability, and proceedings could be administered by a hearing officer appointed by the County or the Agency. A hearing

officer can be more familiar with the interests of both the County and the hauler holding a collection license, as well as the field of waste management, than a criminal or civil court judge would be. The hearing officer may be an employee of the County or the Agency, or an individual selected from outside government service. The hearing officer should be able to administer an adversarial proceeding in which evidence is presented and arguments are heard in a fair and impartial manner.

Administrative proceedings would offer fundamental procedural safeguards, such as the right to call and cross examine witnesses under oath, to be represented by counsel, and an obligation on the part of the hearing officer to make findings of fact and conclusions of law, as the foundation for any penalties assessed. Civil monetary penalties would be assessed before more drastic remedies of license revocation could be employed. In an administrative system, appeal of an adverse determination would be brought to the courts in an Article 78 proceeding. Where the determination that is challenged is the result of a quasi-judicial hearing, the standard applied is whether the determination is supported by substantial evidence, a generally favorable standard for the government if the evidence is established.

The object of the administrative system should be to induce compliance by the regulated haulers, who will be primarily concerned that the system is enforced uniformly and consistently. Experience in other communities suggests that haulers experiencing flow control regulation for the first time will react in a variety of ways. The foremost concern will be that a competitor will not comply, and will thereby escape payment of a higher tip fee, and use that competitive advantage to attract new customers. The municipal response to this concern must be adequate staffing and preparation to monitor compliance, identify and promptly prosecute violators. In general, it is useful to meet with haulers in advance of the adoption of the law, and to provide a sufficient period to allow haulers to modify collection routes, and if necessary, incorporate expected rate increases into their billing.

Because the primary concerns of regulated haulers will be on increased costs, both to themselves and their competitors, we recommend that any tip fee increases that may accompany the implementation of the law be stepped and moderate. This may require the continued reliance on the Net Service Fee, or a waste volume based "Green Fee" for a period of time after implementation of flow control.

The County should expect some, but by no means all haulers to test the enforcement system. This will require a staff familiar with the service areas of local haulers, together with an understanding of their collection routes and the distances from these routes to out-of-County disposal facilities and local transfer stations. Sufficient field personnel should be employed to identify haulers who are not delivering waste to the County's designated facilities, supported by Agency staff who can report tonnages delivered and, identify probable violators for observation and attention.

The elements of proof required for a determination that waste generated in the County was collected, but not delivered to a County facility will be a) that the hauler provides service to a location or customer within the County; b) that the customer generated waste and the hauler collected it; and c) that the waste was not delivered as required by law. Proof of these elements can be simplified through the use of rebuttable presumptions in the law. A rebuttable presumption is a logical inference that can be drawn from a set of established facts, and taken as true unless rebutted by proof offered by the accused.

Useful presumptions for flow control laws would include a presumption that a hauler is providing service to a location if the hauler provides a container to the customer. A second presumption would be that a container observed to contain waste and later observed to be empty, creates a presumption that the waste was collected by the hauler. A third would be that a truck observed collecting on a route within the County that does not cross County scales within a specified number of hours creates a presumption that the waste was disposed of elsewhere, in violation of the law. The use of presumptions allows enforcement personnel to issue a summons without having to

track and follow a waste truck throughout its route to an ultimate destination that may be miles outside County borders. Haulers may rebut the presumption with evidence that they did not service the stop, collect the waste or deliver it to an illegal location, but the burden of proof will shift, and a conviction obtained if no innocent explanation is offered.

Training for enforcement personnel should include familiarity with prepared form summonses, violation notices and supporting affidavits. Field personnel should be prepared to issue violations for three (3) primary offenses: failure to deliver MSW collected in the County to the proper designated facility; failure to deliver recyclables collected in the County to the proper facility; and commingling of recyclables with MSW at or after the point of collection.

The Dutchess County Department of Solid Waste Management licensed 22 companies as authorized haulers in 2008. Of these, only nine (9) delivered waste of any amount to the Agency. Of the nine (9) licensed haulers delivering waste, only three (3) delivered more than 1,000 tons: Royal Carting - 117,300; Waste Management of Kingston - 6,800; and Nieco Container - 1,400. Six (6) companies delivered less than 1,000 tons and the remainder delivered nothing at all. It is not clear whether all of these companies are still in the business of collecting waste in Dutchess, or if they are, how much waste they are collecting and where they are taking it.

The County's current license application packet requires the submission by the applicant of a variety of information that would be useful in enforcing a flow control law. The required submissions include information on waste and recyclable tonnage collected, point of disposal and approximate number of customers. However, there is no current procedure for confirming the accuracy or timeliness of the information submitted. We recommend that the customer information now required be expanded to include area-based numbers for residential customers (e.g., number of residences collected in a town or other area), lists of commercial customers with the size of any containers provided and the frequency of collection. Such information should be updated quarterly, or at such other intervals as the County finds to be workable.

Customer information can be used to estimate the total amount of waste that is collected by the hauler in a given period, and this estimate can be compared with actual deliveries to Agency facilities.

Field enforcement personnel can review the submitted customer lists to determine if a hauler is collecting at more stops than reported, or if waste from any stops is being transported to non-Agency facilities. Review of customer lists against delivered tonnage can identify subjects for further investigation, and can provide a point of departure for surveillance and evidence gathering in a prosecution.

Given the number of haulers working currently in Dutchess, we recommend that three (3) field personnel be assigned to enforcement at the outset of the program. Of these, at least one (1) individual should be retained as a full-time field officer following the initial six (6) months of enforcement. Experience in other communities shows that once the enforcement effort is proven consistent and even-handed, compliance becomes normal operating practice for the hauling community. The staff devoted to enforcement at the beginning of the program should be larger, and individuals might be borrowed from other assignments for temporary posting. The knowledge gained by these individuals will be valuable, however, and the County should make efforts to draw on their expertise when needed. The cost for enforcement personnel should be paid from the revenues gained from the delivery of a greater volume of waste.

A revised local flow control law can be a valuable tool in expanding the Agency's current level of services to a County-wide system focused on increased recycling, composting and energy recovery from solid waste. It would provide the means to incorporate private and public collection services into the system, and assist in the planning for the additional infrastructure needed to achieve the goals outlined in the County's Solid Waste Management Plan.

I. Future Financial Structure

Dutchess County, through the DCRRA, has for over 20 years, provided an integrated group of solid waste management services which are of significant value to the County's residents, businesses, industries and institutions.

The Agency has provided an environmentally-superior means of managing over 50% of the municipal solid waste generated in the County through its Resource Recovery Facility. In 2005, the Agency underscored its commitment to environmental protection by installing a new air pollution control system which has proven highly effective in reducing acid gas emissions to substantially below the levels permitted under Federal and State regulations.

1. Closure or Sale Not Recommended

For both the original decision to construct the RRF and the decision to upgrade the air pollution control system, the Agency and the County made major, long-term public policy decisions to build a system that would achieve a higher level of environmental protection and environmental benefits than would be the case if the County had not elected to provide solid waste management services or if the County relied on a landfill based system. This also means that the County and the Agency have made major financial commitments on behalf of the residents, businesses and institutions in the County. These commitments were based on the continued operation of the RRF for at least the term of the bonds issued for Facility construction and the air pollution control retro-fit. Those bond terms and the associated debt service are shown in Table 8. Both the Agency and the County have made irrevocable commitments to repay the bonds as indicated in the debt service schedule.

In addition to the financial obligations assumed by the Agency, the State of New York contributed $13.4 million in 1972 Environmental Quality Bond Act (EQBA) funds to the construction of the Facility. In exchange for this contribution, the Commissioner of the

Department of Environmental Conservation reserved the right to approve any major change in the project, and required the Agency to ensure that the Contractor continue to operate the Facility through the term of the Service Agreement and any extension thereto. In practical terms, these reservations require the Agency to secure the approval of the Commissioner to any early termination of the Service Agreement, or any major modification to the project, such as an expansion or a shut-down.

Therefore, in order to close the Facility, the Agency must secure the consent of the DEC, and in all probability, provide some demonstration of an alternate means of managing the waste generated in the County, and how this alternate means will be implemented. If this consent is secured, the Agency and the County must still meet the financial commitment made to the holders of Agency bonds. Essentially, this means that even if the Facility were closed, the County would have to pay approximately $4.5 million per year through 2014 and $1.6 million per year from 2015 through 2027, in addition to providing other commitments regarding waste management that may be required by DEC.

Although there has been concern expressed about the relative cost of paying the annual debt service expense and operating costs, the most serious concern is with the increase in the County Net Service Fee payment in recent years.

In analyzing possibilities to modify the debt service expense, we have considered, but do not recommend, refinancing either remaining bond issue to extend the term of repayment. Given the age and projected useful life of the Facility and the objective of minimizing interest expenses, it would not be prudent to extend the term of the bonds. In fact, in a relatively short time, 2014, the initial bond issue will be paid off thereby relieving $3.8 million in annual debt service expense (and barring any future borrowing).

We have also evaluated the potential for the Agency and County to defease the outstanding bonds. As shown in the Defeasance Analysis prepared by Environmental Capital included as Appendix D, this would require the County to deposit approximately

$27 million in a defeasance reserve which would be legally restricted and would be used to satisfy the financial interests of the bond holders. This approach would not appear to be in the best financial interest of the County.

We have considered whether the Agency's interest in the RRF could be sold to a private entity. The County has made an investment in the RRF on the public's behalf and the public's financial interest would have to be carefully considered along with the implications for changes to the solid waste service provided to the public. Any private company potentially interested in buying the RRF will evaluate the cost of operation, the cost to acquire the Facility, revenues from energy sales and the revenue from tipping fees to offset the cost of operation as indicated below.

Service Fee	$ 8,583,012
Pass-Throughs	$ 2,525,750
Residue Disposal	$ 3,488,713
2009 Debt Service	$ 4,629,453
Total Cost	$19,226,928
Energy Revenue	$ 2,910,600
Net Cost	$16,316,328

Theoretically, the Agency and County could satisfy the debt service obligation by defeasing the bonds. That would eliminate the $4,629,543.00 annual debt service expenses and result in a calculated cost of operation of over $75.00 per ton based on a throughput of 155,000 tons per year. Obviously, we do not recommend this approach because the Agency and County would incur a huge expense while at the same time forfeiting the benefit of owning a Facility that can provide an essential service.

If one were to assume that the Agency or County could sell the RRF for the $27 million needed to defease the bonds that cost to the private buyer would have to be reflected in the tip fee.

In either case, the tip fee necessary to cover all expenses would be significantly higher than other available options, estimated to be $70.00 per ton. Although the County could consider selling the RRF for something less than the amount necessary to defease the outstanding debt, that would leave the Agency and the County with the obligation to satisfy the outstanding bonds on the Facility. It would obviously not be fiscally prudent to retain the debt obligation while forfeiting the ownership of the RRF. In the absence of that type of "subsidy" it is apparent that the operating and debt service expenses mean that there would not be private sector interest in buying the Facility.

In addition to the direct impact on public finances, if the Agency were to discontinue operation of the RRF, it would forfeit any measure of control over the provision of solid waste management services. In this instance, waste would go to the lowest cost disposal option which would likely be long-distance transport to a landfill. In addition to the increased environmental impacts from this change, there would be no safeguard against price hikes or against the vulnerability and financial risk of litigation from improper disposal, or from disposal at a Facility that has environmental problems in the future.

2. Green Fee

In light of the concern with the County Net Service Fee payment, which is currently made from the County general fund and is, therefore, paid by all real property taxpayers in the County, we have identified an alternative that can eliminate the inequitable allocation of the County subsidy and replace it with a fee that is related to the actual volume of waste generated by all real property in the County, with revenues devoted to the environmental protection or "green" facilities and services provided by the Agency. We have reviewed the costs of the Agency and have identified in Table 18 those costs

which can be best categorized as being directly related to the priovision of environmental protection services. A Green Fee would be a special benefit assessment, levied as an annual flat charge to different property classes, raising sufficient revenue, based on tons of waste generated per parcel, to pay for environmental improvements in the waste management system, such as the cost of operating the Maximum Achievable Control Technology at the RRF, among other services. It would not be an ad valorem assessment and would be applicable to a greater number of properties, including many properties otherwise exempt from taxation, because it would be a fee for service, and not a tax.

The County and the Agency can use a Green Fee approach in two (2) different ways. One way would be to use the Green Fee as a substitute for the Net Service Fee now paid from ad valorem taxation and annual appropriation from the County general fund. Here, the Green Fee could be continued for so long as the Agency and the County wish to hold tipping fees at current levels, or gradually reduce the Green Fee as tipping fees (and other Agency revenue sources) are gradually increased, until Agency revenues meet Agency expenditures and the Net Service Fee is no longer necessary.

The second approach would contemplate a permanent Green Fee, whose purpose would be to fund specific environmental costs, and create reserves which could be devoted to system improvements. System improvements such as a new MRF, Household Hazardous Waste Facility, turbine generator efficiencies at the RRF could be partially or wholly funded through the accumulated reserves provided by a Green Fee assessment. From a budgetary perspective, the amount raised by the Green Fee would be a targeted amount based on the planning timeframe for the introduction of the improvements to the system.

Unlike a tax, the Green Fee would be distributed on a weighted basis and would be imposed upon and collected from all non-vacant residential and non-residential properties that generate acceptable municipal waste. As a result, properties that have

in the past been exempt from property taxes can now be charged through the Green Fee.

We have evaluated a new Green Fee for two (2) possible scenarios:

A. To eliminate the current County Net Service Fee payment budgeted for 2009 at $6,930,608.00.

B. To fund the annual environmental protection costs of the Agency plus create reserves for development of a new MRF, construction of a new HHW Facility, and replacement of the turbine at the RRF for a total of $8,555,392.00.

TABLE 17

ENVIRONMENTAL SERVICE CHARGE/GREEN FEE				
PROPERTY CLASSIFICATION	PROPOSED FEE A	ESTIMATED REVENUE	PROPOSED FEE B	ESTIMATED REVENUE
Residential				
Single-Family	$ 45.30	$3,462,596.00	$ 55.80	$4,265,185.00
Two-Family	$ 67.95	$ 283,623.00	$ 83.70	$ 349,363.00
Three-Family & Apartments	$ 90.60	$ 388,130.00	$ 111.60	$ 478,094.00
Commercial/Industrial/Institutional				
Small	$ 200.00	$ 595,400.00	$ 250.00	$ 744,250.00
Medium	$ 800.00	$ 718,400.00	$ 1,000.00	$ 898,000.00
Large	$ 1,600.00	$ 958,400.00	$ 2,000.00	$1,198,000.00
Very Large	$ 3,000.00	$ 498,000.00	$ 3,750.00	$ 622,500.00
Total Revenue		$6,904,549.00		$8,555,392.00

Key:

A – Fees to meet current County net service fee revenue of $6.9 million per year.

B – Fees to meet current County net service fee revenue plus reserves for future projects – total $8.5 million per year.

The Green Fee presented above was constructed using two (2) weighting systems, one (1) for the residential properties and one (1) for the non-residential properties. A detailed study for the Eastern Montgomery County (Pennsylvania) Waste Generation Study, 2006 Update (Montgomery Study), was used as a guideline for developing the weighting systems and which is attached as Appendix D. The property classifications, groupings, and rates shown in Table 17 are based on an initial evaluation of properties in Dutchess County. Additional analysis and field work would be necessary to refine the classifications, groupings and corresponding rates. Of particular note, the apartment classification may warrant its own category due to the size of some apartment complexes. In this case, it would result in a lower rate for other residential and/or commercial/industrial/institutional classifications.

TABLE 18

Environmental Protection Costs and Reserves

Category	Expense
Materials Recovery Facility Operation	$ 250,000.00
Clean Air Act Compliance and Operation	$ 750,000.00
Electric Revenue Operations Share	$ 365,480.00
Ash Residue Testing	$ 15,914.00
Air Pollution Control System Materials and Supplies	$ 432,600.00
Emissions Testing	$ 79,568.00
Continuous Emissions Monitoring	$ 77,250.00
Household Hazardous Waste	$ 128,750.00
Host Community Benefit	$ 258,647.00
Air Pollution Control System Upgrade-Debt Service	$ 1,667,637.00
Wastewater Treatment	$ 41,200.00
Natural Gas-Facility Start Up	$ 123,600.00
Statutory/Regulatory Fees-DEC	$ 35,010.00
MRF Baler Repair	$ 5,305.00
Recycling Containers	$ 21,218.00
Engineering Services	$ 190,550.00
New Household Hazardous Waste Facility Reserve	$ 100,000.00
New Single Stream Materials Recovery Facility Reserve	$ 2,600,000.00
New Turbine Reserve	$ 800,000.00
General Capital Reserve	$ 612,663.00
TOTAL	$ 8,555,392.00

The general capital reserve could be utilized to establish Agency functions at the new transfer stations such as scale and billing systems, to acquire equipment for composting, as a contingency for planned capital projects, or for other capital projects identified as part of the Agency's long range planning process.

The property classifications in Table 17 were identified using the New York State Office of Real Property Service's [ORPS] parcel codes. All property codes were included except for agricultural (100), vacant land (200), public service (800) and public parks,

wild, forested and conservation (900) properties. The parcel codes were also used to determine what properties were to be considered as residential or non-residential.

A breakdown of the parcel codes illustrates that residential properties constitute the largest percentage of properties in Dutchess County, which is consistent with our finding that residential properties generate approximately 60% of the waste in the County. As a result, 60% of the $6.9 million Net Service Fee target and the $8.5 million environmental costs and reserve fund target were assigned to residential properties, and the remaining 40% to non-residential properties. Once the properties were broken down into residential and non-residential categories, they were further separated based on their possible population and rate of waste generation.

Residential properties were separated into three (3) categories based on the number of possible dwelling units per property. Some properties that are classified by ORPS as commercial were included in the residential properties. These properties include: camps, cottages and bungalows, downtown row-type houses, and apartments. The three (3) residential categories assigned were Single-Family Residential, Dual-Family Residential, and Multi-Family Residential. Based upon the number of possible dwellings per property, each category was assigned a weighting unit. Single-Family Residential properties were assigned a single unit weighting. Dual-Family Residential properties were assigned a 1.5 unit weighting, and Multi-Family Residential properties were assigned a two-unit weighting. This corresponds to a relative ratio where a two-family parcel is expected to generate 1.5 times the amount of waste generated at a single family home in the course of a year, and a three-family home, twice the amount.[15]

The total number of parcels in each category was multiplied by this unit weighting to represent the number of units in each category:

[15] This ratio is commonly applied by Long Island municipalities in calculating residential waste service rates, and is based on the recognition that multi-family structures do not produce multiples of certain types of waste that single-family homes generate, such as waste from household or structural repairs, yard and garden wastes, certain furnishings and other wastes. Parcels identified as rental apartments were included in the three-family classification due to the large number of apartment buildings in the County with relatively low gross floor areas, under 5,000 sq. ft. In an application of this model, the County should confirm the relative amounts of waste generated at single-family and apartment residences through field surveys, coupled with information gathered from Hauler customer lists.

Number of Parcels x Unit Weight = Category Units

A unit cost was developed by dividing the 60% of the $6.9 million that was assigned to residential properties by the total number of residential units:

($6,900,000x0.6)/Total Residential Units = Unit Cost

To assign a charge per parcel, the number of units in each category was multiplied by the unit cost. This was then divided by the number of actual parcels in each category:

Category Units x Unit Cost = Total Unit Cost
Total Unit Cost/Number of Parcels = Parcel Charge

Using the Montgomery Study as a guideline, the non-residential properties were placed into four (4) categories: Small, Medium, Large and Extra-Large properties reflecting the relative waste generation level in tons per year (tpy). In the Montgomery Study, non-residential properties were separated into eight (8) categories based on the size and waste generation of the property, in order to capture the entire cost of the waste system as a benefit assessment.[16] To reduce the eight (8) categories in the Montgomery Study to the four (4) that were used for Dutchess, various classes from the Montgomery Study (p. 21 of Appendix D) were combined. Montgomery Classes A and B were combined to represent the Small category (0-2 tpy). Classes C, D and E represented the Medium category (2-7 tpy). Classes F and G were combined to represent the Large category (7-20 tpy) and Class H represented the Extra-Large category (more than 20 tpy). Allocation of each non-residential property into their category was based on the similarity between their parcel code description and the description of properties in the Montgomery Study. (Breakdown of non-residential properties by land use is set forth in

[16] The Montgomery County system is entirely funded through benefit assessments based upon field surveys done over a period of years to determine how much waste is typically generated by particular land uses. Eight (8) property classifications are used by Montgomery County based upon a tons-per-year average for each use and group of uses. We have simplified the Green Fee framework to four (4) classes for Dutchess County, in part because a smaller revenue target is planned.

a spreadsheet annexed as Appendix E). Each non-residential property category was then assigned a fee per parcel, as shown above.

We note here that a more precise and parcel-specific calculation of the amount of waste generated by non-residential properties can be accomplished through disclosure of container sizes and collection frequency for individual customers of licensed haulers. For example, a disclosure-based assessment system is operated by the Town of Smithtown on Long Island. There, the haulers licensed to collect waste in the Town provide container and service information to the Town, which assesses the property owners an annual waste disposal charge on the property tax bill. Haulers are allowed to tip waste collected in the Town at no charge. An appeal process is provided for property owners to challenge the weight and volume collection calculation made by the Town to arrive at the assessment, and to make adjustments for changes in use. The Smithtown system (also known as the "Tulsa system" for the city that pioneered this approach), has been successfully employed for over seven (7) years. In applying a similar approach in Dutchess, haulers would provide the required information in order to keep tip fees relatively low.

In considering the implementation of a Green Fee system, the County and the Agency should first determine whether the system will be used to fund system reserves and improvements for a long period. The administrative effort required to set up the system may not be worthwhile if the object is to eliminate the payment of the Net Service Fee as soon as possible.

The Agency and the County will also want to consider the cost to set up and administer the Green Fee system. The start up costs will depend on whether the Agency and the County go with a system based solely on the land use categories or a system that obtains actual waste volumes and frequency of service from commercial haulers.

Once the billing categories are finalized, the most cost effective approach may be to utilize the existing real property tax billing system. New software may be needed to

create a unique billing universe for the Green Fee, but it would be developed from the real property tax data. This could be done as a contract expense with the existing tax office.

New staff would be needed to receive and post payments and to track down late payments and enforce against delinquencies.

III. SPECIFIC RECOMMENDED ACTIONS

This report recommends a series of specific actions to advance the Dutchess County solid waste management system from its current service level and fee structure to a self sustaining and modern system with minimal environmental impacts. Achievement of all of the goals outlined here will require long-term commitment and steady, incremental progress over several years. The major steps recommended, are as follows:

Summary of Recommended Actions

1. Develop a new single stream materials recovery facility.

2. Develop a survey to document the volumes and current management practices for green waste and for all major institutional generators of food waste in order to evaluate the potential for increased organics recovery.

3. Implement an Environmental Service Fee or Green Fee to cover the ongoing current costs of providing environmental protection services such as recycling, household hazardous waste management, and operation of the upgraded air pollution control system and to build reserves for future environmental protection facilities and projects. This will replace the County general fund as the revenue source for payment of the Net Service Fee.

4. Implement flow control for all solid waste and residential recyclables generated in Dutchess County in order to provide a comprehensive, coordinated, and integrated management system.

5. Adopt a capital budget plan as part of the 2010 budget that designates new facilities and existing Facility upgrades and establishes a method to build reserves over the next five years to finance new facilities , including:

- new MRF
- new HHW Facility
- new turbine for RRF

6. Contact the Ulster County Resource Recovery Agency to determine the feasibility of developing an intermunicipal agreement to receive waste from northern Dutchess County at the UCRRA transfer station in Kingston.

7. Complete an RFP process to secure a transfer station capability for haulers for waste generated in the southern part of the County.

8. Construct a new permanent HHW Facility to be operated on a year-round basis.

9. Initiate a diagnostic study of the existing RRF to identify the scope and cost of major maintenance, replacements and upgrades that will be required to extend the operating life of the Facility over the next 25 to 30 years. (2009-2014)

10. Construct additional waste-to-energy capacity sized to reflect the performance of new single stream recycling, waste reduction and product stewardship, and increased organics recovery.

11. Continue to evaluate the development of a local ash landfill. (ongoing)

APPENDICES

A. WARM Work Sheets- Summary

B. Green Fee Land Use Classification & Back-Up Calculations

C. Local Law: Flow Control

D. Defeasance Analysis

E. Green Fee Spreadsheet

TABLES

APPENDIX A

GHG Emissions Analysis -- Summary Report

Version 8.01 (3/09)
GHG Emissions Waste Management Analysis for DCRRA
Prepared by: GERHARDT
Project Period for this Analysis: 01/01/08 to 12/31/08

GHG Emissions from Baseline Waste Management (MTCE): 21,205

Commodity	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCE
Aluminum Cans	-	2,606	-	NA	50
Steel Cans	-	2,606	-	NA	50
Glass	-	13,031	-	NA	251
HDPE	-	2,606	-	NA	50
PET	-	2,606	-	NA	50
Corrugated Cardboard	-	18,244	-	NA	1,815
Magazines/third-class	-	5,212	-	NA	(421)
Newspaper	-	13,031	-	NA	(3,055)
Office Paper	-	10,425	-	NA	5,109
Phonebooks	-	2,606	-	NA	(611)
Textbooks	-	2,606	-	NA	1,277
Dimensional Lumber	-	7,819	-	NA	(1,045)
Food Scraps	NA	54,732	-	-	10,632
Yard Trimmings	NA	2,606	-	-	(222)
Grass	NA	2,606	-	-	130
Leaves	NA	2,606	-	-	(391)
Branches	NA	2,606	-	-	(348)
Mixed Paper, Broad	-	13,031	-	NA	1,082
Mixed Paper, Resid.	-	10,405	-	NA	617
Mixed Paper, Office	-	10,405	-	NA	1,175
Mixed Metals	-	10,405	-	NA	201
Mixed Plastics	-	18,244	-	NA	352
Mixed MSW	NA	39,102	-	NA	4,256
Clay Bricks	NA	5,212	NA	NA	100
Concrete	-	5,212	NA	NA	100

GHG Emissions from Alternative Waste Management Scenario (MTCE): (10,136)

Commodity	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCE
Aluminum Cans	-	104	1,042	1,460	NA	(344)
Steel Cans	-	104	1,042	1,460	NA	(643)
Glass	-	521	5,212	7,298	NA	160
HDPE	-	104	1,042	1,460	NA	340
PET	-	104	1,042	1,460	NA	402
Corrugated Cardboard	-	2,468	5,580	10,216	NA	(3,379)
Magazines/third-class	-	208	2,085	2,919	NA	(722)
Newspaper	-	2,102	5,212	5,717	NA	(4,000)
Office Paper	-	417	4,170	5,838	NA	709
Phonebooks	-	104	1,042	1,460	NA	(819)
Textbooks	-	104	1,042	1,460	NA	170
Dimensional Lumber	-	313	3,128	4,376	NA	(1,569)
Food Scraps	NA	NA	21,552	32,329	851	2,549
Yard Trimmings	NA	NA	1,042	1,460	104	(184)
Grass	NA	NA	1,042	1,460	104	(43)
Leaves	NA	NA	1,042	1,460	104	(251)
Branches	NA	NA	1,042	1,460	104	(234)
Mixed Paper, Broad	NA	521	5,212	7,298	NA	(1,388)
Mixed Paper, Resid.	NA	417	4,170	5,838	NA	(1,201)
Mixed Paper, Office	NA	417	4,170	5,838	NA	(876)
Mixed Metals	NA	417	4,170	5,838	NA	(2,218)
Mixed Plastics	NA	730	7,298	10,216	NA	2,549
Mixed MSW	NA	NA	12,696	26,406	NA	455
Clay Bricks	-	NA	5,212	NA	NA	100
Concrete	NA	-	5,212	NA	NA	100

Total Change in GHG Emissions (MTCE): (31,341)

This is equivalent to...		
Removing	21,048	Passenger Cars from the Roadway Each Year

Note: a negative value (i.e., a value in parentheses) indicates an emission reduction; a positive value indicates an emission increase.

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).

GHG Emissions Analysis -- Summary Report

Version 6.01 (3/09)

GHG Emissions Waste Management Analysis for DCRRA
Prepared by: GERHARDT
Project Period for this Analysis: 01/01/08 to 12/31/08

GHG Emissions from Baseline Waste Management (MTCE): **21,205**

Commodity	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCE
Aluminum Cans	-	2,606	-	NA	50
Steel Cans	-	2,606	-	NA	50
Glass	-	13,031	-	NA	251
HDPE	-	2,606	-	NA	50
PET	-	2,606	-	NA	50
Corrugated Cardboard	-	18,244	-	NA	1,815
Magazines/third-class	-	5,212	-	NA	(421)
Newspaper	-	13,031	-	NA	(3,055)
Office Paper	-	10,425	-	NA	5,109
Phonebooks	-	2,606	-	NA	(611)
Textbooks	-	2,606	-	NA	1,277
Dimensional Lumber	-	7,819	-	NA	(1,045)
Food Scraps	NA	54,732	-	-	10,632
Yard Trimmings	NA	2,606	-	-	(222)
Grass	NA	2,606	-	-	130
Leaves	NA	2,606	-	-	(391)
Branches	NA	2,606	-	-	(348)
Mixed Paper, Broad	-	13,031	-	NA	1,062
Mixed Paper, Resid.	-	10,405	-	NA	617
Mixed Paper, Office	-	10,405	-	NA	1,175
Mixed Metals	-	10,405	-	NA	201
Mixed Plastics	-	18,244	-	NA	362
Mixed MSW	NA	39,102	-	NA	4,256
Clay Bricks	NA	5,212	NA	NA	100
Concrete	-	5,212	NA	NA	100

GHG Emissions from Alternative Waste Management Scenario (MTCE): **(37,567)**

Commodity	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCE
Aluminum Cans	-	1,339	507	760	NA	(4,971)
Steel Cans	-	1,339	507	760	NA	(965)
Glass	-	3,894	8,777	560	NA	(106)
HDPE	-	339	907	1,360	NA	223
PET	-	339	1,507	760	NA	107
Corrugated Cardboard	-	12,371	2,349	3,524	NA	(10,901)
Magazines/third-class	-	1,678	1,414	2,120	NA	(1,795)
Newspaper	-	2,721	2,124	8,186	NA	(4,266)
Office Paper	-	1,365	1,110	7,960	NA	(1,888)
Phonebooks	-	339	907	1,360	NA	(738)
Textbooks	-	339	907	1,360	NA	(78)
Dimensional Lumber	-	1,016	2,721	4,082	NA	(1,922)
Food Scraps	NA	NA	12,693	39,039	3,000	382
Yard Trimmings	NA	NA	842	1,264	500	(176)
Grass	NA	NA	842	1,264	500	(92)
Leaves	NA	NA	842	1,264	500	(231)
Branches	NA	NA	842	1,264	500	(217)
Mixed Paper, Broad	NA	1,694	1,535	9,802	NA	(3,277)
Mixed Paper, Resid.	NA	1,355	628	8,422	NA	(2,784)
Mixed Paper, Office	NA	1,355	628	8,422	NA	(2,580)
Mixed Metals	NA	1,355	628	8,422	NA	(4,392)
Mixed Plastics	NA	2,372	3,349	12,523	NA	2,403
Mixed MSW	NA	NA	12,698	26,406	NA	455
Clay Bricks	-	NA	5,212	NA	NA	100
Concrete	NA	-	5,212	NA	NA	100

Total Change in GHG Emissions (MTCE): **(58,772)**

This is equivalent to...		
Removing	**39,470**	Passenger Cars from the Roadway Each Year

Note: a negative value (i.e., a value in parentheses) indicates an emission reduction; a positive value indicates an emission increase.

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).

GHG Emissions Analysis -- Summary Report

Version 9.01 (3/09)

GHG Emissions Waste Management Analysis for DCRRA
Prepared by: GERHARDT
Project Period for this Analysis: 01/01/08 to 12/31/08

GHG Emissions from Baseline Waste Management (MTCE): 21,205

Commodity	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCE
Aluminum Cans	-	2,606	-	NA	50
Steel Cans	-	2,606	-	NA	50
Glass	-	13,031	-	NA	251
HDPE	-	2,606	-	NA	50
PET	-	2,606	-	NA	50
Corrugated Cardboard	-	18,244	-	NA	1,815
Magazines/third-class	-	5,212	-	NA	(421)
Newspaper	-	13,031	-	NA	(3,055)
Office Paper	-	10,425	-	NA	5,109
Phonebooks	-	2,606	-	NA	(611)
Textbooks	-	2,606	-	NA	1,277
Dimensional Lumber	-	7,819	-	NA	(1,045)
Food Scraps	NA	54,732	-	-	10,632
Yard Trimmings	NA	2,606	-	-	(222)
Grass	NA	2,606	-	-	130
Leaves	NA	2,606	-	-	(391)
Branches	NA	2,606	-	-	(348)
Mixed Paper, Broad	-	13,031	-	NA	1,082
Mixed Paper, Resid.	-	10,405	-	NA	817
Mixed Paper, Office	-	10,405	-	NA	1,175
Mixed Metals	-	10,405	-	NA	201
Mixed Plastics	-	18,244	-	NA	352
Mixed MSW	NA	39,102	-	NA	4,266
Clay Bricks	NA	5,212	NA	NA	100
Concrete	-	5,212	NA	NA	100

GHG Emissions from Alternative Waste Management Scenario (MTCE): (51,889)

Commodity	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total MTCE
Aluminum Cans	-	1,339	507	760	NA	(4,972)
Steel Cans	-	1,339	507	760	NA	(1,189)
Glass	-	3,894	6,777	560	NA	(135)
HDPE	-	339	-	2,267	NA	428
PET	-	339	-	2,267	NA	517
Corrugated Cardboard	-	14,871	-	3,373	NA	(13,229)
Magazines/third-class	2,000	1,678	-	1,534	NA	(6,330)
Newspaper	-	5,221	-	7,810	NA	(5,569)
Office Paper	-	1,355	-	9,070	NA	(2,624)
Phonebooks	-	339	-	2,267	NA	(711)
Textbooks	-	339	-	2,267	NA	(680)
Dimensional Lumber	-	1,016	-	6,803	NA	(2,143)
Food Scraps	NA	NA	-	51,732	3,000	(2,708)
Yard Trimmings	NA	NA	-	2,106	500	(156)
Grass	NA	NA	-	2,106	500	(156)
Leaves	NA	NA	-	2,106	500	(156)
Branches	NA	NA	-	2,106	500	(156)
Mixed Paper, Broad	NA	1,694	-	11,337	NA	(3,862)
Mixed Paper, Resid.	NA	1,355	-	9,050	NA	(2,934)
Mixed Paper, Office	NA	1,355	-	9,050	NA	(2,754)
Mixed Metals	NA	1,355	-	9,050	NA	(4,588)
Mixed Plastics	NA	2,372	-	15,872	NA	3,227
Mixed MSW	NA	NA	-	39,102	NA	(1,373)
Clay Bricks	-	NA	5,212	NA	NA	100
Concrete	NA	-	5,212	NA	NA	100

Total Change in GHG Emissions (MTCE): (73,094)

This is equivalent to...		
Removing	49,088	Passenger Cars from the Roadway Each Year

Note: a negative value (i.e., a value in parentheses) indicates an emission reduction; a positive value indicates an emission increase.

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).

LANDFILL BASED SYSTEM

Energy Analysis - Summary Report

(Version 9.01, 3/09)

Analysis of Energy Use from Waste Management for GERHARDT
Prepared by DCRRA
Reporting Period for this Analysis is from 1/1/08 to 12/31/08

Energy Use from Baseline Waste Management (million BTU): 92,545

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Million BTU
Aluminum Cans	0	2,606	0	N/A	2,530
Steel Cans	0	2,606	0	N/A	2,530
Glass	0	13,031	0	N/A	12,649
HDPE	0	2,606	0	N/A	2,530
PET	0	2,606	0	N/A	2,530
Corrugated Boxes	0	18,244	0	N/A	-1,173
Magazines/third-class mail	0	5,212	0	N/A	2,881
Newspaper	0	13,031	0	N/A	7,855
Office Paper	0	10,425	0	N/A	-8,105
Phonebooks	0	2,606	0	N/A	1,571
Textbooks	0	2,606	0	N/A	-2,026
Dimensional Lumber	0	7,819	0	N/A	3,408
Food Scraps	N/A	54,732	0	0	16,495
Yard Trimmings	N/A	2,606	0	0	1,590
Grass	N/A	2,606	0	0	1,679
Leaves	N/A	2,606	0	0	1,864
Branches	N/A	2,606	0	0	1,136
Mixed Paper (general)	0	13,031	0	N/A	33
Mixed Paper (primarily residential)	0	10,425	0	N/A	532
Mixed Paper (primarily from offices)	0	10,425	0	N/A	281
Mixed Metals	0	10,425	0	N/A	10,120
Mixed Plastics	0	18,244	0	N/A	17,710
Mixed MSW	N/A	39,102	0	N/A	3,808
Clay Bricks	N/A	5,212	N/A	N/A	5,059
Aggregate	0	5,212	N/A	N/A	5,059

EXISTING SYSTEM

Energy Analysis - Summary Report

(Version 9.01, 3/09)

Analysis of Energy Use from Waste Management for DCRRA
Prepared by GERHARDT
Reporting Period for this Analysis is from 1/1/08 to 12/31/08

Energy Use from Baseline Waste Management (million BTU): -1,131,140

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Million BTU
Aluminum Cans	104	1,042	1,460	N/A	-19,511
Steel Cans	104	1,042	1,460	N/A	-26,033
Glass	521	5,212	7,298	N/A	7,869
HDPE	104	1,042	1,460	N/A	-34,148
PET	104	1,042	1,460	N/A	-19,795
Corrugated Boxes	2,468	5,560	10,216	N/A	-115,448
Magazines/third-class mail	208	2,085	2,919	N/A	-15,212
Newspaper	2,102	5,212	5,717	N/A	-80,390
Office Paper	417	4,170	5,838	N/A	-49,877
Phonebooks	104	1,042	1,460	N/A	-13,034
Textbooks	104	1,042	1,460	N/A	-11,477
Dimensional Lumber	313	3,128	4,378	N/A	-37,558
Food Scraps	N/A	21,552	32,329	851	-69,045
Yard Trimmings	N/A	1,042	1,460	104	-3,434
Grass	N/A	1,042	1,460	104	-3,398
Leaves	N/A	1,042	1,460	104	-3,324
Branches	N/A	1,042	1,460	104	-3,615
Mixed Paper (general)	521	5,212	7,298	N/A	-67,162
Mixed Paper (primarily residential)	417	4,170	5,838	N/A	-53,334
Mixed Paper (primarily from offices)	417	4,170	5,838	N/A	-46,184
Mixed Metals	417	4,170	5,838	N/A	-23,734
Mixed Plastics	730	7,298	10,216	N/A	-197,686
Mixed MSW	N/A	12,696	26,406	N/A	-255,501
Clay Bricks	N/A	5,212	N/A	N/A	5,059
Aggregate	208	5,004	N/A	N/A	4,831

IMPROVED SYSTEM

Energy Analysis - Summary Report

(Version 9.01, 3/09)

Analysis of Energy Use from Waste Management for DCRRA
Prepared by GERHARDT
Reporting Period for this Analysis is from 1/1/08 to 12/31/08

Energy Use from Alternative Waste Management Scenario (million BTU): -1,975,640

Material	Tons Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Million BTU
Aluminum Cans	0	1,339	507	760	N/A	-275,440
Steel Cans	0	1,339	507	760	N/A	-39,264
Glass	0	3,694	8,777	560	N/A	899
HDPE	0	339	907	1,360	N/A	-44,200
PET	0	339	1,507	760	N/A	-24,423
Corrugated Boxes	0	12,371	2,349	3,524	N/A	-217,686
Magazines/third-class mail	0	1,678	1,414	2,120	N/A	-12,180
Newspaper	0	2,721	2,124	8,186	N/A	-113,560
Office Paper	0	1,355	1,110	7,960	N/A	-72,392
Phonebooks	0	339	907	1,360	N/A	-14,949
Textbooks	0	339	907	1,360	N/A	-10,774
Dimensional Lumber	0	1,016	2,721	4,082	N/A	-34,692
Food Scraps	N/A	N/A	12,693	39,039	3,000	-86,242
Yard Trimmings	N/A	N/A	842	1,264	500	-2,770
Grass	N/A	N/A	842	1,264	500	-2,741
Leaves	N/A	N/A	842	1,264	500	-2,682
Branches	N/A	N/A	842	1,264	500	-2,917
Mixed Paper (general)	N/A	1,694	1,535	9,802	N/A	-113,049
Mixed Paper (primarily residential)	N/A	1,355	628	8,442	N/A	-94,665
Mixed Paper (primarily from offices)	N/A	1,355	628	8,442	N/A	-77,435
Mixed Metals	N/A	1,355	3,628	5,442	N/A	-94,203
Mixed Plastics	N/A	2,372	3,349	12,523	N/A	-325,602
Mixed MSW	N/A	N/A	5,640	33,462	N/A	-324,791
Clay Bricks	0	N/A	5,212	N/A	N/A	5,059
Aggregate	N/A	0	5,212	N/A	N/A	5,059

NEW SYSTEM

Energy Analysis - Summary Report

(Version 9.01, 3/09)

Analysis of Energy Use from Waste Management for DCRRA
Prepared by GERHARDT
Reporting Period for this Analysis is from 1/1/08 to 12/31/08

Energy Use from Alternative Waste Management Scenario (million BTU): -2,397,716

Material	Tons Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Million BTU
Aluminum Cans	0	1,339	0	1,267	N/A	-275,603
Steel Cans	0	1,339	0	1,267	N/A	-48,426
Glass	0	3,694	3,630	5,707	N/A	-1,328
HDPE	0	339	0	2,267	N/A	-63,633
PET	0	339	0	2,267	N/A	-41,689
Corrugated Boxes	0	14,871	0	3,373	N/A	-254,990
Magazines/third-class mail	2,000	1,678	0	1,534	N/A	-76,124
Newspaper	0	5,221	0	7,810	N/A	-152,891
Office Paper	0	1,355	0	9,070	N/A	-79,595
Phonebooks	0	339	0	2,267	N/A	-23,244
Textbooks	0	339	0	2,267	N/A	-16,660
Dimensional Lumber	0	1,016	0	6,803	N/A	-60,179
Food Scraps	N/A	N/A	0	51,732	3,000	-119,921
Yard Trimmings	N/A	N/A	0	2,106	500	-5,666
Grass	N/A	N/A	0	2,106	500	-5,666
Leaves	N/A	N/A	0	2,106	500	-5,666
Branches	N/A	N/A	0	2,106	500	-5,666
Mixed Paper (general)	N/A	1,694	0	11,337	N/A	-124,666
Mixed Paper (primarily residential)	N/A	1,355	0	9,070	N/A	-99,427
Mixed Paper (primarily from offices)	N/A	1,355	0	9,070	N/A	-81,806
Mixed Metals	N/A	1,355	0	9,070	N/A	-95,727
Mixed Plastics	N/A	2,372	0	15,872	N/A	-383,370
Mixed MSW	N/A	N/A	0	39,102	N/A	-380,176
Clay Bricks	0	N/A	5,212	N/A	N/A	5,059
Aggregate	N/A	5,212	0	N/A	N/A	-657

AMENDMENTS TO LOCAL LAW NO. 1 of 1984

A LOCAL LAW PROVIDING FOR THE MANAGEMENT OF SOLID WASTE GENERATED WITHIN THE COUNTY OF DUTCHESS

BE IT ENACTED by the Legislature of the County of Dutchess as follows:

SECTION 1. Short Title. This local law shall be known and may be cited as the solid waste management law.

SECTION 2 **shall be amended to read as follows**. Purposes. This local law is adopted pursuant to Chapter 675 of the Laws of 1982 of the State of New York for the purpose of (1) effectuating the management on a county-wide basis of all solid waste generated within or coming into from outside of the County of Dutchess in order to protect the public health and safety and to improve the environment by control of air, water and land pollution, and (2) carrying out the expressed policy of the State to displace competition with regulation or monopoly public service. **The provisions of this local law are re-authorized to effectuate the policies of the State of New York for the management of solid waste and to advance the goals of the Local Solid Waste Management Plan of Dutchess County. It is the policy of the County to provide an integrated solid waste management program available to all residents of the County, utilizing the public facilities provided by the Dutchess County Resource Recovery Agency. It is the policy of the County and the Agency to plan for and provide suitable facilities and programs to encourage the reduction, recycling, recovery of energy, and environmentally sound land disposal of solid wastes generated within Dutchess County. This local law is adopted in order to advance these goals.**

SECTION 3 **of this local law shall be amended to red as follows**:

Definitions. As used or referred to in this local law, unless the context otherwise requires:

1. "Agency" shall mean the Dutchess County Resource Recovery Agency created under Chapter 675 of the Laws of 1982 of the State of New York.

2. **"Agency Solid Waste Management Facility" shall mean any facility employed beyond the initial solid waste collection process, including but not limited to transfer stations, storage areas or facilities, sanitary landfills, waste-to-energy or resource recovery facilities, incinerators and composting facilities, that is owned or operated by the Dutchess County Resource Recovery Agency, or is operated by an entity under contract with the Dutchess County Resource Recovery Agency and which is obligated pursuant to such contract to receive and process Solid Waste or Recyclable Materials generated in Dutchess County.**

3. "Commercial Waste" shall mean Solid Waste generated by stores, offices, institutions, restaurants, warehouses, non-manufacturing activities in industrial facilities and agricultural enterprises.

4. "Commercial Waste Permit" shall mean the permit issued pursuant to Section III.1 of this local law.

5. "Commissioner of Solid Waste Management" shall mean the Commissioner of Solid Waste Management of the County of Dutchess.

6. "Container" shall mean a container provided, or marked for identification by a Waste Collector for use in the collection of Solid Waste and/or Recyclables within the County. Containers shall be issued an identification number by the Commissioner pursuant to Section III (1)(m) below.

7. "County of Dutchess" **or "County"** shall mean the entire County of Dutchess as constituted and existing under the Laws of the State of New York.

8. "Disposal of Solid Waste" shall mean the transporting or delivery of solid waste to a solid waste facility.

9. "Municipality" shall mean any county, city, town, village, improvement district (or a county, city, town or village acting on behalf of an improvement district), public corporation, municipal corporation, political subdivision, government agency, department or bureau of the state or federal government.

10. "Person" shall mean any natural person, individual, partnership, co-partnership, association, joint venture, corporation**, limited liability company**, trust, estate or any other **business** entity.

11. "Private Hauler" shall mean any Person or entity, other than a Municipality, established on a regular commercial basis to collect, transport, or dispose of Solid Waste or Recyclable Materials, provided however that this definition shall not include Persons primarily engaged in residential clean-out services, those whpo self-haul theior own waste from a single site, or construction contractors hauling materials from a single site twhere they are working.

12. "Recyclable Materials" shall mean those materials, as specifically designated by the Commissioner which shall be separated from the Solid Waste stream for collection and/or delivery to a materials recovery facility or other facility designated by the Commissioner. The list of Designated Recyclables may be modified from time to time by the Commissioner pursuant to the provisions of Local Law No. 4 of 1990.

13. "Residential Waste" shall mean Solid Waste generated from all houses, apartments and other residential dwellings, including, but not limited to, all single family dwellings and multifamily dwellings in the County.

14. "Residential Recyclables" shall mean Recyclable Materials generated from all houses, apartments and other residential dwellings, including, but not limited to, all single family dwellings and multifamily dwellings in the County.

15. "Solid Waste" **shall have the meaning specified in 6 NYCRR Part 360-1.2 as the same may be amended, superseded or replaced.**

16. "Vehicle" shall mean any device required by law to be registered with a state or federal agency for travel over public roads and which, if used for the transportation or collection of Solid Waste or Recyclable Materials shall meet the vehicular standards set forth herein. For identification purposes, in the case of a tractor-trailer combination, the tractor and trailer will be considered sparate vehicles; in the case of a roll-off container or other moveable containment device, the container and undercarriage will be considered to be separate vehicles.

SECTION 4 **of this Local Law shall be amended to read as follows:**
Disposal of Solid Waste **and Residential Recyclables.**

1. The Commissioner of Solid Waste Management shall adopt, promulgate, amend and repeal rules and regulations affecting Solid Waste Management in Dutchess County. The Commissioner shall consult with the Dutchess County Resource Recovery Agency in the development of such rules and regulations to ensure compatibility with the rules governing use of the facilities and programs of the Agency.

2. The Commissioner of Solid Waste Management is hereby authorized and directed to designate in writing, from time to time, one or more **Agency Solid Waste Management Facilities** to be used for the disposal of **Solid W**aste **and Residential Recyclables** generated within the County of Dutchess, which designation may include a determination that a particular **Agency Solid Waste Management Facility** shall be the only facility used for the disposal of solid waste generated within all of, or a described area within, the County of Dutchess or by a particular person or persons. In making any such designation the Commissioner of Solid Waste Management shall give due consideration to the capacity of any facility so designated, the size and population of the area or person or persons to be served and such other factors as shall enable the Commissioner of Solid Waste Management to determine that the public interest is served by such designation. No person shall dispose of **Solid W**aste **or Residential Recyclables** generated within the County of Dutchess, except at **an Agency Solid Waste Management Facility** designated by the Commissioner of Solid Waste Management in accordance with this Section. The Commissioner of Solid Waste Management is hereby authorized and directed to promulgate such rules and regulations as he shall determine to be necessary to effectuate the purposes of this local law, including the requirement that all private haulers of solid waste be licensed by the Commissioner of Solid Waste Management. All acts and proceedings taken by the Commissioner of Solid Waste Management pursuant to this local law shall, in all respects, be

consistent with the Environmental Conservation Law and other applicable laws and rules and regulations promulgated pursuant thereto.

3. **All Persons authorized or directed to deliver Solid Waste or Residential Recyclables to an Agency Solid Waste Management Facility shall be responsible for the payment of the applicable fee established by the Agency for the receipt and disposal of such material.**

This Local Law shall be amended to add a new Section 5 as follows:

Section 5: Licensing of Waste Collectors

1) **No Private Hauler shall collect, transport or dispose of Solid Waste and/or Recyclable Materials generated within the County without obtaining a License pursuant to this section. The term of a license issued pursuant to this section shall be two years, or such other period as determined by the Commissioner. Each day during which a Private Hauler collects, transports or disposes of Solid Waste or Recyclables generated within the County without a license shall be considered a separate violation of this section.**

2) **All applications for Commercial Waste Permits shall be in writing and shall be accompanied by a license application fee and contain such information as requested by the Commissioner, including but not limited to the following:**

a. **Disclosure of background information to establish the good character and fitness of the applicant, its principal owners, officers, directors and employees with respect to criminal background, past licensing history in other jurisdictions and other relevant information;**

b. **Information regarding vehicles and equipment to be used in the performance of service in the county, including but not limited to type, capacity, and registration and identification;**

c. **Proof of insurance as required by law or determined by the Commissioner to be necessary for the conduct of a solid waste collection business in the County;**

d. **Information regarding the type and amount of Solid Waste and Recyclable Materials collected within the county, including but not limited to customer locations, collection frequency, volume and number of containers provided to customers, collection routes and other information, updated on a regular basis.**

3. **It shall be a condition of every license issued pursuant to this section that the holder of such license shall at all times be in compliance with the provisions of this Local Law and Local Law number 4 of 1990.**

SECTION 5 **of this local law is re-numbered as SECTION 6 and amended to read as follows:**

SECTION 6. Enforcement.

1. It shall be the responsibility of the Commissioner of Solid Waste Management, in consultation with the County Attorney, to enforce the provisions of this local law and all rules, regulations and designations made pursuant thereto. Such enforcement shall be by such legal or equitable proceedings, including without limitation a proceeding for specific performance, brought in the name of the County of Dutchess as may be provided or authorized by law.

2) Proceedings to establish a violation of any provision of this Local Law shall be commenced by the service of a Notice of Violation upon the offender. Any Person accused of a violation of this Local Law shall be entitled to a hearing conducted by an impartial Hearing Officer appointed by the Commissioner. The Hearing Officer shall give notice thereof, stating the name and address of the license holder concerned, the subject matter of the hearing and the date, place and hour thereof designated therefor, by mailing a copy thereof to the alleged violator at least ten (10) days prior to said hearing. In any hearing conducted pursuant to this section, all witnesses shall be sworn and examined under oath, subject to cross-examination. A stenographic record of the proceedings shall be kept. Evidence submitted shall be relevant and may include evidence as to the past performance of the alleged violator. Hearsay evidence shall be admissible, but shall be accorded such weight as the hearing officer deems appropriate, consistent with its reliability. Findings of fact shall be made by the Hearing Officer, in writing, upon a preponderance of the evidence.

3) There shall be rebuttable presumptions in the enforcement of this local law that:

a The placement of any Container which is marked or identified with the name of any Private Hauler, at any location within the County, shall be presumptive evidence that said Private Hauler is providing solid waste collection services at said location within the County as of the date of said placement.

b Evidence of Solid Waste in a Container located as described in subsection (a) above, and subsequent observation of the same Container empty, shall be presumptive evidence that Solid Waste was collected from the Container by the Private Hauler whose name is marked on the Container.

c The failure to deliver any Solid Waste to a designated Agency Facility within three days of the collection of Solid Waste from any location within the County shall be presumptive evidence of a violation of Section Four (2) of this local law.

4. The determination of the Hearing Officer shall be final and shall be subject to review in a special proceeding pursuant to Article 78 of the CPLR.

SECTIONS 6, 7, 8 and 9 shall be re-numbered as and amended to read as follows:

SECTION 7. Penalties. Any person who violates this local law shall be **subject to a civil penalty** of not **less** than Five Hundred Dollars ($500.00) **and not more than Five Thousand Dollars ($5,000.00)** and/or suspension or revocation of **any license issued pursuant to this Local Law.**

SECTION **8**. Priority. Pursuant to Section 1 of Chapter 675 of the Laws of 1982 of the State of New York, this local law takes precedence over and shall supercede any inconsistent provisions of any local law enacted by any municipality within the County of Dutchess.

SECTION **9**. Separability. If any section, provision, or part thereof, in this local law, or the application thereof to any person or circumstances, is adjudged invalid or unconstitutional by a court of competent jurisdiction, then such adjudication shall not affect the validity of the remainder of the local law or the validity of the local law as a whole or any sections, provisions, or part thereof, not so adjudged invalid or unconstitutional and the application of the local law or any section, provision or part thereof, to other persons or circumstances shall not be affected by said adjudication.

SECTION **10**. Effective Date. This local law shall take effect immediately.

Debt Service Schedule

Date	Principal	Coupon	Interest	Total P+I
01/01/2009	-	-	-	-
01/01/2010	2,420,000.00	5.150%	839,207.50	3,259,207.50
01/01/2011	3,075,000.00	5.250%	714,577.50	3,789,577.50
01/01/2012	3,235,000.00	5.350%	553,140.00	3,788,140.00
01/01/2013	3,410,000.00	5.400%	380,067.50	3,790,067.50
01/01/2014	3,595,000.00	5.450%	195,927.50	3,790,927.50
Total	**$15,735,000.00**	-	**$2,682,920.00**	**$18,417,920.00**

Yield Statistics

Bond Year Dollars	$49,890.00
Average Life	3.171 Years
Average Coupon	5.3776709%
Net Interest Cost (NIC)	5.3776709%
True Interest Cost (TIC)	5.3751641%
Bond Yield for Arbitrage Purposes	5.3751641%
All Inclusive Cost (AIC)	5.3751641%

IRS Form 8038

Net Interest Cost	5.3776709%
Weighted Average Maturity	3.171 Years

Bond Balance Report

Date	Principal	Coupon	Interest	Total P+I	Bond Balance
01/01/2009	-	-	-	-	15,735,000.00
01/01/2010	2,420,000.00	5.150%	839,207.50	3,259,207.50	13,315,000.00
01/01/2011	3,075,000.00	5.250%	714,577.50	3,789,577.50	10,240,000.00
01/01/2012	3,235,000.00	5.350%	553,140.00	3,788,140.00	7,005,000.00
01/01/2013	3,410,000.00	5.400%	380,067.50	3,790,067.50	3,595,000.00
01/01/2014	3,595,000.00	5.450%	195,927.50	3,790,927.50	-
Total	**$15,735,000.00**	-	**$2,682,920.00**	**$18,417,920.00**	-

DCRRA - 2007 Bonds

2010 Cash Defeasance - SLGS

January 1, 2010

Sources & Uses

Dated 01/01/2010 | Delivered 01/01/2010

Sources Of Funds

Par Amount of Bonds	$16,819,179.00
Transfers from 2007 Bonds DSR Funds	858,551.00
Total Sources	**$17,677,730.00**

Uses Of Funds

Deposit to Net Cash Escrow Fund	17,677,729.16
Rounding Amount	0.84
Total Uses	**$17,677,730.00**

Escrow Fund Cashflow

Date	Principal	Rate	Interest	Receipts	Disbursements	Cash Balance
01/01/2010	-	-	-	1.16	-	1.16
07/01/2010	118,576.00	0.310%	252,742.19	371,318.19	371,318.75	0.60
01/01/2011	118,168.00	0.500%	253,150.75	371,318.75	371,318.75	0.60
07/01/2011	118,759.00	0.740%	252,559.91	371,318.91	371,318.75	0.76
01/01/2012	119,198.00	0.990%	252,120.51	371,318.51	371,318.75	0.52
07/01/2012	119,788.00	1.260%	251,530.48	371,318.48	371,318.75	0.25
01/01/2013	120,543.00	1.520%	250,775.82	371,318.82	371,318.75	0.32
07/01/2013	121,459.00	1.770%	249,859.70	371,318.70	371,318.75	0.27
01/01/2014	122,534.00	2.000%	248,784.79	371,318.79	371,318.75	0.31
07/01/2014	123,760.00	2.230%	247,559.45	371,319.45	371,318.75	1.01
01/01/2015	3,900,139.00	2.460%	246,179.53	4,146,318.53	4,146,318.75	0.79
07/01/2015	85,861.00	2.680%	198,207.83	284,068.83	284,068.75	0.87
01/01/2016	1,062,011.00	2.870%	197,057.30	1,259,068.30	1,259,068.75	0.42
07/01/2016	77,876.00	3.030%	181,817.45	259,693.45	259,693.75	0.12
01/01/2017	11,469,056.00	3.150%	180,637.63	11,649,693.63	11,649,693.75	-
Total	**$17,677,728.00**	-	**$3,262,983.34**	**$20,940,712.50**	**$20,940,712.50**	-

Investment Parameters

Investment Model [PV, GIC, or Securities]	Securities
Default investment yield target	Unrestricted
Cash Deposit	1.16
Cost of Investments Purchased with Bond Proceeds	17,677,728.00
Total Cost of Investments	$17,677,729.16
Target Cost of Investments at bond yield	$20,940,712.50
Actual positive or (negative) arbitrage	3,262,983.34
Yield to Receipt	2.9652193%
Yield for Arbitrage Purposes	8.24E-15
State and Local Government Series (SLGS) rates for	7/02/2009

Escrow Summary Cost

Maturity	Type	Coupon	Yield	Price	Par Amount	Principal Cost	+Accrued Interest	= Total Cost
Escrow								
07/01/2010	SLGS-CI	0.310%	0.310%	100-.000000	118,576	118,576.00	-	118,576.00
01/01/2011	SLGS-CI	0.500%	0.500%	100-.000000	118,168	118,168.00	-	118,168.00
07/01/2011	SLGS-NT	0.740%	0.740%	100-.000000	118,759	118,759.00	-	118,759.00
01/01/2012	SLGS-NT	0.990%	0.990%	100-.000000	119,198	119,198.00	-	119,198.00
07/01/2012	SLGS-NT	1.260%	1.260%	100-.000000	119,788	119,788.00	-	119,788.00
01/01/2013	SLGS-NT	1.520%	1.520%	100-.000000	120,543	120,543.00	-	120,543.00
07/01/2013	SLGS-NT	1.770%	1.770%	100-.000000	121,459	121,459.00	-	121,459.00
01/01/2014	SLGS-NT	2.000%	2.000%	100-.000000	122,534	122,534.00	-	122,534.00
07/01/2014	SLGS-NT	2.230%	2.230%	100-.000000	123,760	123,760.00	-	123,760.00
01/01/2015	SLGS-NT	2.460%	2.460%	100-.000000	3,900,139	3,900,139.00	-	3,900,139.00
07/01/2015	SLGS-NT	2.680%	2.680%	100-.000000	85,861	85,861.00	-	85,861.00
01/01/2016	SLGS-NT	2.870%	2.870%	100-.000000	1,062,011	1,062,011.00	-	1,062,011.00
07/01/2016	SLGS-NT	3.030%	3.030%	100-.000000	77,876	77,876.00	-	77,876.00
01/01/2017	SLGS-NT	3.150%	3.150%	100-.000000	11,469,056	11,469,056.00	-	11,469,056.00
Subtotal		-	-	-	**$17,677,728**	**$17,677,728.00**	-	**$17,677,728.00**
Total		-	-	-	**$17,677,728**	**$17,677,728.00**	-	**$17,677,728.00**

Escrow	
Cash Deposit	1.16
Cost of Investments Purchased with Bond Proceeds	17,677,728.00
Total Cost of Investments	$17,677,729.16

Delivery Date	1/01/2010

Debt Service To Maturity And To Call

Part 1 of 2

Date	Refunded Bonds	Interest to Call	D/S To Call	Principal	Coupon	Interest	Refunded D/S
07/01/2010	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
01/01/2011	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
07/01/2011	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
01/01/2012	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
07/01/2012	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
01/01/2013	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
07/01/2013	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
01/01/2014	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
07/01/2014	-	371,318.75	371,318.75	-	-	371,318.75	371,318.75
01/01/2015	3,775,000.00	371,318.75	4,146,318.75	925,000.00	5.000%	371,318.75	1,296,318.75
07/01/2015	-	284,068.75	284,068.75	-	-	348,193.75	348,193.75
01/01/2016	975,000.00	284,068.75	1,259,068.75	975,000.00	5.000%	348,193.75	1,323,193.75
07/01/2016	-	259,693.75	259,693.75	-	-	323,818.75	323,818.75
01/01/2017	11,390,000.00	259,693.75	11,649,693.75	1,020,000.00	5.000%	323,818.75	1,343,818.75
07/01/2017	-	-	-	-	-	298,318.75	298,318.75
01/01/2018	-	-	-	1,070,000.00	5.000%	298,318.75	1,368,318.75
07/01/2018	-	-	-	-	-	271,568.75	271,568.75
01/01/2019	-	-	-	1,125,000.00	5.000%	271,568.75	1,396,568.75
07/01/2019	-	-	-	-	-	243,443.75	243,443.75
01/01/2020	-	-	-	1,180,000.00	4.250%	243,443.75	1,423,443.75
07/01/2020	-	-	-	-	-	218,368.75	218,368.75
01/01/2021	-	-	-	1,230,000.00	4.250%	218,368.75	1,448,368.75
07/01/2021	-	-	-	-	-	192,231.25	192,231.25
01/01/2022	-	-	-	1,285,000.00	4.250%	192,231.25	1,477,231.25
07/01/2022	-	-	-	-	-	164,925.00	164,925.00
01/01/2023	-	-	-	1,340,000.00	4.500%	164,925.00	1,504,925.00
07/01/2023	-	-	-	-	-	134,775.00	134,775.00
01/01/2024	-	-	-	1,400,000.00	4.500%	134,775.00	1,534,775.00
07/01/2024	-	-	-	-	-	103,275.00	103,275.00
01/01/2025	-	-	-	1,465,000.00	4.500%	103,275.00	1,568,275.00
07/01/2025	-	-	-	-	-	70,312.50	70,312.50
01/01/2026	-	-	-	1,530,000.00	4.500%	70,312.50	1,600,312.50
07/01/2026	-	-	-	-	-	35,887.50	35,887.50
01/01/2027	-	-	-	1,595,000.00	4.500%	35,887.50	1,630,887.50
Total	**$16,140,000.00**	**$4,800,712.50**	**$20,940,712.50**	**$16,140,000.00**	**-**	**$8,523,425.00**	**$24,663,425.00**

Debt Service To Maturity And To Call

Part 2 of 2

Yield Statistics

Base date for Avg. Life & Avg. Coupon Calculation	1/01/2010
Average Life	11.626 Years
Average Coupon	4.5424350%
Weighted Average Maturity (Par Basis)	11.626 Years

Refunding Bond Information

Refunding Dated Date	1/01/2010
Refunding Delivery Date	1/01/2010

DRAFT - 7/7/06

WASTE SYSTEM AUTHORITY
OF
EASTERN MONTGOMERY COUNTY

Montgomery County, Pennsylvania

WASTE GENERATION STUDY 2006 UPDATE

For the Implementation of a Waste Generation Fee

JULY 2006

Prepared by:

GANNETT FLEMING, INC.
1010 Adams Avenue
P.O. Box 80794
Valley Forge, PA 19484

Waste Generation Study
2006 Update
For the Implementation of a Waste Generation Fee

Executive Summary

The purpose of the Waste Generation Study is to: (1) provide the Waste System Authority of Eastern Montgomery County (Waste Authority) with an estimate of the potential waste generation for the 22 participating municipalities; (2) develop a reasonable and uniform basis of allocating the waste generation fee; and (3) provide a basis for collecting the waste generation fee.

The waste generation fee (Waste Generation Fee) is apportioned on a weighted basis and will be imposed and collected directly or indirectly from all owners of non-vacant real property that generate waste. This report outlines the methodologies for estimating waste generation for residential and non-residential properties in the participating municipalities. This report also presents procedures for conducting waste generation surveys and sets forth, in our opinion, a reasonable and uniform basis of allocating the Waste Generation Fee.

This Waste Generation Study was designed and conducted by Gannett Fleming with assistance from Waste Authority personnel during the period November 2005 through June 2006. In 2004, a similar study (2004 Study) was conducted for the Waste Authority for the purpose of providing an estimate of waste generation at that time. The 2004 Study was an update of the original study completed in 1998 (1998 Study), update of the study completed in 2000 (2000 Study) and an update of the study completed in 2002 (2002 Study). Therefore, this study represents an update of the 2004 Study, the 2002 Study, the 2000 Study and the 1998 Study.

The Waste Authority was formed in 1989 to oversee construction of a privately owned 1,200 tons per day mass burn resource recovery facility in Plymouth Township, Montgomery County, Pennsylvania (Facility) and to manage the system of waste disposal for municipalities in eastern Montgomery County. The Waste Authority and the 22 participating municipalities (Participating Municipalities) developed a system to assure that the waste generated in those municipalities was disposed of at the Facility. The system was based on an Inter-Municipal Agreement that required each Participating Municipality to enact flow control ordinances directing all acceptable solid waste to the resource recovery facility.

A Waste Generation Fee program was instituted in 1999 to maintain the economic viability of the solid waste system after a flow control ordinance similar to those relied upon by the County and the Participating Municipalities was struck down by the United States Supreme Court in the Carbone decision. The Waste Generation Fee applies to all residential and non-residential generators of acceptable municipal waste in the Participating Municipalities. The Waste Generation Fees represent the Waste Authority's revenue requirement necessary to cover its expenses in operating and maintaining the waste

system, including the cost of paying the service fees for disposal costs at the Facility and operating and maintaining the Waste Authority's transfer stations and administrative functions.

The Waste Generation Study utilizes the Montgomery County Board of Assessment's land use codes (LUC) to broadly categorizes non-vacant property as being either Single Family Residential; Multi-family Residential; or Non-residential real properties. Both the Multi-family Residential; and Non-residential real properties are further classified into similar business groups based upon their LUC and the results of a field survey. The Participating Municipalities total estimated waste generation is based on the LUC and the waste generating capacity of each property. The waste generating capacity of a property is based on its size.

The size of each Single Family Residential and Multi-family Residential property is based upon the number of dwelling units listed by the Montgomery County Board of Assessment. The size of each Non-residential property is based upon the square footage of net floor area established by reviewing the Montgomery County Board of Assessment's records. The square footage of gross floor area of each Non-residential property is divided by 2,000 and rounded to the nearest whole number to produce a business size indicator.

The total waste generation for each property is the product of multiplying the size of the property by the estimated rate of generation or Waste Generation Classification (WGC). The WGC represents the average of the range of estimated waste generation for each type of property comprising that property grouping. The WGC for Single Family Residential properties is estimated based upon historical deliveries. For the five municipalities that do not pay for their deliveries, the estimate is based upon their historical deliveries divided by the total number of dwelling units located on each property. For the 17 municipalities that pay for their residential deliveries, the estimate is also based upon their historical deliveries.

The WGC for Multi-family Residential and Non-residential properties is estimated by examining the results of field surveys. This was accomplished by surveying a sample of the total number of these properties and evaluating how much waste, by volume, the properties dispose of weekly. This data, when used in combination with waste density information, yields estimated waste generation rates in tons per unit size of each Multi-family Residential and Non-residential Business property. The field survey resulted in 2,968 properties being surveyed, including 2,192 Non-residential properties (28% of the number of properties, representing 41% of the square footage of the population) and 778 Multi-Family properties (37% of the number of properties, representing 43% of the dwelling units). Using the field survey results, each Multi-family Residential property was assigned to one of two WGCs while the each Non-residential property was assigned to one of eight WGCs. The assigned WGC represents the weighted average of the range of estimated waste generation for the types of properties or LUCs that comprise each WGC.

The product of multiplying the unit size of each property by the assigned WGC represents the total estimated tons of waste generation. This current Waste Generation Study identifies and allocates 372,643 tons of waste in the Participating Municipalities. This allocation includes 175,727 Single Family tons (i.e., residential waste) and 196,916 of commercial tons (25,610 Multi-Family Residential tons and

171,306 Non-residential tons). The allocations are based on the rates of generation per property unit size shown in the table below.

Property Type	Rate Class	2006 Study Estimated Rate of Generation (Tons Per Unit Size)	Tons Allocated
Authority Assessed WGF Tonnage			
Non Residential	A	0.867	14,151
Non Residential	B	1.236	41,567
Non Residential	C	2.427	70,919
Non Residential	D	3.706	5,779
Non Residential	E	5.222	4,084
Non Residential	F	10.036	24,106
Non Residential	G	14.494	8,354
Non Residential	H	27.228	2,264
Multi-family	M	0.872	9,370
Multi-family	N	0.569	16,240
Single Family	S	1.637	53,506
Total Authority Assessed WGF Tonnage			250,340
Municipal Full Paid Tonnage			
Non Residential	Actual	Full Rate	82
Single Family	Actual	Full Rate	122,221
Total Municipal Full Paid Tonnage			122,303
Total Tonnage Allocated			372,643

The 1998 Study estimated 93% of the actual tons delivered by the Participating Municipalities in the two operating years following that Study (1999-2000), the 2000 Study estimated 98% of the actual tons delivered by the Participating Municipalities in the two operating years following that Study (2001-2002),

the 2002 Study estimated 98% of the actual tons delivered by the Participating Municipalities in the two operating years following that Study (2003-2004) and the 2004 Study estimated 95% of the actual tons delivered by the Participating Municipalities in the two operating years following that Study (2005, and 2006 annualized year to-date). The 372,643 tons currently estimated and identified in this Waste Generation Study is equal to about 96% of the actual tons delivered by the Participating Municipalities during the current year, 2006 (annualized year to-date). These results indicate the Waste Generation Studies provide a reasonably reliable projection of the amount of waste generated in the Participating Municipalities and, in our opinion, a reasonable and uniform basis of allocating the Waste Generation Fee.

The Waste Authority receives and reviews appeals from waste generators so a property owner may adjust inaccurate information. The Waste Generation Fee for a given property is appealable to the Waste Authority on two grounds: the size of the building or number of dwelling units and the Business Group. Because the underlying records are derived from official sources (i.e., property tax records), the burden of proof in any appeal is on the party contesting the bill pursuant to the Waste Authority's Rules and Regulations.

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5.0 CLARIFICATIONS AND COMPARISONS

1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide the Waste System Authority of Eastern Montgomery County (Waste Authority) with an estimate of the potential waste generation for the participating municipalities, develop a reasonable and uniformed basis of allocating the waste generation fee and provide a means of collecting the waste generation fee. The waste generation fee (Waste Generation Fee) is apportioned on a weight basis and will be imposed and collected directly or indirectly from all owners of real property that generate waste. This report outlines the methodologies for estimating waste generation for residential and non-residential properties in the participating municipalities. This report also presents procedures for conducting waste generation surveys and sets forth, in our opinion, a reasonable and uniform basis of allocating the Waste Generation Fee.

This Waste Generation Study was designed and conducted by Gannett Fleming with assistance from Waste Authority personnel during the period November 2005 through June 2006. In 2004, a similar study (2004 Study) was conducted for the Waste Authority for the purpose of providing an estimate of waste generation at that time. The 2004 Study was an update of the original study completed in 1998 (1998 Study), the second study completed in 2000 (2000 Study) and the third study completed in 2002 (2002 Study). Therefore, this study represents an update of the 2004 Study, the 2002 Study, the 2000 Study and the 1998 Study (collectively referred to as the "Last Four Studies").

The current study and the Last Four Studies were modeled after the waste generation studies and solid waste service fee programs of Montgomery County, Maryland[1] and Palm Beach County, Florida[2] (Comparison Waste Generation Studies). Many factors influence the rate of waste generation for both residential and non-residential properties. These factors may include population, income levels, occupancy rates, opportunities for recycling, housing characteristics, composition of businesses, business characteristics and many others. Accordingly, comparisons of data from different time periods, different parts of the county and based on varying measures of generation (e.g., lbs/person, tons/employee, tons/single-family dwelling, tons/square foot, etc.) are viewed as general trends and not as absolute measures.

1.2 Background

The Waste Authority was formed in 1989 to oversee construction of a privately owned 1,200 tons per day mass burn resource recovery facility and to manage the system of waste disposal for municipalities in eastern Montgomery County, in Plymouth Township, Montgomery County Pennsylvania (Facility). The Waste Authority and the 22 participating municipalities (Participating Municipalities) developed a system to assure that the waste generated in those municipalities was disposed of at the Facility. The system was based on an Inter-Municipal Agreement that required each Participating Municipality to enact flow control ordinances, directing all acceptable solid waste to the Facility. The municipalities that comprise

[1] Montgomery County, Maryland, Department of Transportation, Division of Solid Waste Services, Fiscal Year 1996 Solid Waste Services Charges and Fiscal Year 1998 Solid Waste Services Charges.

[2] Daniel Pellowitz, Commercial Generation Study (May 22, 1995) and 1997 Residential Generation Study (September 10, 1997), Solid Waste Authority of Palm Beach County, Florida.

the Participating Municipalities are listed in Table 1.

Table 1

Participating Municipalities

1	Abington Township	12	Narberth Borough
2	Ambler Township	13	Norristown Borough
3	Bryn Athyn Borough	14	Plymouth Township
4	Cheltenham Township	15	Rockledge Borough
5	Conshohocken Township	16	Springfield Township
6	E. Norriton Township	17	U. Dublin Township
7	Hatboro Township	18	U. Merion Township
8	Horsham Township	19	U. Moreland Township
9	Jenkintown Borough	20	W. Conshohocken Borough
10	L. Merion Township	21	Whitemarsh Township
11	L. Moreland Township	22	Whitpain Township

The Waste Authority operates a waste system consisting of two transfer stations, a resource recovery facility, residual disposal sites, and other contractual arrangements in connection with the County Solid Waste Management Plan. Seventy-one haulers are licensed to provide waste collection services in the Waste Authority's system. According to the Montgomery County Planning Commission (MCPC), the Waste Authority's Participating Municipalities currently have a population of about 420,814 (equal to 54% Montgomery County's total population) and a commercial base that employs about 324,479 people (equal to 64% Montgomery County's total employment). From 1992 to 1998 the Participating Municipalities delivered an average of 301,868 tons annually. During the two years following the 1998 Study, 1999-2000, the Participating Municipalities delivered an average of 369,468 tons annually, during the two years following the 2000 Study, 2001-2002, they delivered an average of 362,021 and they delivered 371,243 following the 2002 Study, 2003-2004. Following the 2004 Study, 2005-2006[3], the Participating Municipalities delivered an average of 387,708 tons annually.

Historically, most of the waste of the Participating Municipalities remained in the Waste Authority's service area through flow control ordinances (1992-1994) and through hauler cooperation and contracts (1995-1998). However, because of the United States Supreme Court decision, in Carbone of May 1994, the Waste Authority and Participating Municipalities considered alternative programs that would allow the municipalities to continue to deliver sufficient waste in accordance with the Inter-Municipal Agreement. In February 1998, both the Montgomery County Commissioners and the Waste Authority authorized the development of a service-based program with Waste Generation Fees imposed.

[3] The deliveries for the year 2006 reflect actual deliveries for the period January 2006 through June 2006, converted to an annual basis based on the Waste Authority's annualization factor of 48.7%.

The Waste Generation Fee program was instituted in 1999 to maintain the economic viability of the solid waste system. The Waste Generation Fee applies to all residential and non-residential generators of acceptable municipal waste in the 22 Participating Municipalities. The Waste Generation Fee represents the Waste Authority's revenue requirement necessary to cover its expenses in operating and maintaining the waste system, including the cost of paying the service fees for disposal costs at the Facility and operating and maintaining the Waste Authority's transfer stations and administrative functions.

2.0 SCOPE OF WASTE GENERATION STUDY

2.1 Introduction

The purpose of this Waste Generation Study is to provide an estimate of the potential waste generation for the Participating Municipalities, develop a reasonable and uniformed basis of allocating the Waste Generation Fee and provide a means of collecting the Waste Generation Fee. The first phase of preparing the Waste Generation Study involved determining the types of properties that exist in the Participating Municipalities. The Montgomery County Board of Assessment property records were used for these purposes. Property owners are responsible for the waste generation that a property is estimated to generate based on its land use code (LUC). The Montgomery County LUCs are listed in Exhibit 1.

In total, the Montgomery County Board of Assessment currently uses 381 different LUCs. All LUCs depicting vacant land or non-waste producing properties were eliminated. After these eliminations, 241 LUCs remained that described waste generating property. These surviving LUC's were then separated into residential and non-residential LUCs.

2.2 Methodology for Residential Properties

Residential waste generation is categorized into one of two groups: (1) Single Family Residential and; (2) Multi-family Residential. Each group's categorization is based upon the Montgomery County Board of Assessment's LUCs. The waste generation from Single Family Residential properties assessed a Waste Generation Fee is allocated based upon the total number of Single Family Units (SFU) of all Single Family Residential properties. For Single Family Residential properties, each SFU represents an estimate of the number of family dwelling units within the Single Family property. The estimate of family dwelling units is based upon the LUCs contained in the Montgomery County Board of Assessment records. For each Single Family Residential property, the allocation of the Waste Generation Fee is the product of multiplying the number of SFUs of the property by the estimated rate of generation or Waste Generation Classification (WGC) by the per ton Waste Generation Fee as shown below:

$$SFU \times WGC_{\text{Single Family Residential properties}} = Tons \times (Waste\ Generation\ Fee/Ton)$$

The waste generation for Multi-family Residential properties is estimated by examining the results of our field surveys and land use for each Multi-family Residential property. A detailed description of the field surveys is presented in Section 3.0 of this report. Reviewing Montgomery County Board of Assessment records establishes the land use for each Multi-family Residential real property owner. Each Multi-family Residential property land use is grouped into a similar Business Group based upon all the results of our survey.

For Multi-family Residential properties, a business size indicator (BSI) is assigned to depict the waste generating capacity based on the size of each property. The BSI for Multi-family Residential properties is based upon the number of dwelling units listed in the Montgomery County Board of Assessment records (i.e., an apartment with 20 units is assigned 20 BSIs). For each Multi-family Residential property, the BSI is based upon the number of dwelling units at each property location.

Each Business Group is also assigned a Multi-family Residential Waste Generation Classification (WGC). The assigned Multi-family Residential WGC represents the average of the range of estimated waste generation for each type of property comprising each Business Group. For each Business Group, the assigned WGC is based upon the results of the field survey. By doing so, the WGC provides a fair indicator of the waste generation per BSI within a Business Group. The data collected during the field survey also determined the exact number of different Multi-family Residential WGCs to be assigned.

For each Multi-family Residential property, the allocation of the Waste Generation Fee is the product of multiplying the BSI of the property by the WGC. This resulting quantity represents the total estimated tons of waste generation for each Multi-family Residential property. The product of multiplying the Multi-family Residential properties' total estimated tons by the Waste Generation Fee produces their total Waste Generation Fee as shown below:

$$BSI \times WGC_{\text{Multi-family Residential properties}} = \text{Tons} \times (\text{Waste Generation Fee/Ton})$$

2.3 Methodology for Non-Residential Properties

Reviewing Montgomery County Board of Assessment records establishes the land use for each Non-residential real property owner. Each Non-residential property land use is grouped into a similar Business Group based upon all the results of our survey. For example, all banks comprise one Business Group, while shopping malls form another Business Group.

The waste generating capacity for Non-residential properties is based upon the size of a property and it's Business Group. Reviewing Montgomery County Board of Assessment records and the Waste Authority's assessment records has established the square footage of net leasable floor area of all Non-residential properties. For properties with square footage above 999 feet, the square footage of net floor area is divided by 2,000 and rounded to the nearest whole number to produce a business size indicator (BSI) unit for each property. For example, a property with 2,600 square feet of net floor area is assigned one BSI unit (2,600 ÷ 2,000 = 1.3 rounded to 1). All properties with less than 500 square feet are assigned a BSI unit of 0.13. A BSI unit of 0.38 is assigned to all properties with square footage between 500 and 999 feet. Within each Business Group, the BSI is the basis of allocating the Waste Generation Fee.

Each Business Group is also assigned a Non-residential Waste Generation Classification (WGC). The assigned Non-residential WGC represents the weighted average of the range of estimated waste generation for a number of Business Groups. The minimum and maximum range of each Non-residential WGC begins (ends) with the minimum (maximum) range of the bordering WGC. For example, if one WGC includes waste generation within the range of one to two tons, the succeeding WGC would have a range from two to three tons.

For each Business Group, the assigned WGC is based upon the results of the field survey. By doing so, the WGC provides a fair indicator of the waste generation per BSI within a Business Group. The data collected during the field survey also determined the exact number of different Non-residential WGCs to be assigned.

The Waste Authority's total Non-residential Waste Generation Fee is allocated based upon the total estimated waste generation for all Non-residential real property. For each Non-residential property, the allocation of the Waste Generation Fee is the product of multiplying the BSI of the property by the weighted average of the range of the assigned WGC. This resulting quantity represents the total estimated tons of waste generation. The product of multiplying a Non-residential property's estimated tons by the per ton Waste Generation Fee produces the total Waste Generation Fee for that property as shown below:

$$BSI \times WGC_{\text{Non-Residential properties}} = \text{Tons} \times (\text{Waste Generation Fee/Ton})$$

Multiplying the sum of all the Business Groups' total estimated tons by the Waste Generation Fee produces the Waste Authority's total Non-residential Waste Generation Fee revenues.

The Waste Generation Fee for each Non-residential real property owner is based upon its assigned Business Group, the WGC, the BSI of the property, and the Waste Generation Fee. In summary, the Non-residential Waste Generation Fee allocation method: (1) is imposed on property owners; (2) reflects the nature of the business occupying the land; (3) is based on waste generation by weight; and (4) is applied equally per BSI for each Business Grouping.

3.0 FIELD SURVEY

3.1 Survey Procedures

An estimate of waste generation for commercial properties (i.e., Multi-family Residential and Non-residential properties) was prepared using waste generation data gathered through field surveys and dwelling units and square footage data provided by the Montgomery County Board of Assessment and the Waste Authority's assessment records.[4] This was accomplished by surveying a sample of the total number of these properties and evaluating how much waste, by volume, the properties dispose of weekly. This data, when used in combination with waste density information, yields estimated waste generation rates in tons per BSI for each Multi-family Residential property and each Non-residential Business Group.

3.2 Selecting Properties to Survey

The purpose of the field survey is to obtain waste generation data from a sample of Non-residential and Multi-family Residential properties that were being assessed a Waste Generation Fee by the Waste Authority as of May 1, 2006. The sample of Non-residential and Multi-family Residential properties is intended to be reasonably representative of the total population of Non-residential and Multi-family Residential being assessed by the Waste Authority.

The Multi-family Residential and Non-residential properties were sampled according to LUC for purposes of estimating waste generation and allocating the Waste Generation Fee. Exhibit 2 lists the 241 LUCs, the number of properties and the number of surveys completed.

According to the Waste Authority's Waste Generation Fee assessment records, there are a total of 9,856[5] Multi-family Residential and Non-residential properties in the Participating Municipalities[6]. The number of properties contained in each LUC ranges from one to 2,391[7]. Many Non-residential properties are found in the LUC related to retail and shopping centers. Approximately 3,068 properties and more than 126 million square feet are dedicated to retail and shopping land uses in the Waste Authority's system. Manufacturing/Warehousing LUC includes approximately 1,011 properties and approximately 345 million square feet of net floor area. The largest LUC measured in net floor area relate to Office Building, with 608 million square feet of net floor area and 1,257 properties.

The sampling methodology included selecting different sample sizes, measured as a percentage of the

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[4] The Participating Municipalities total estimated waste generation from Single Family properties is estimate based upon historical deliveries because the type and the origin of those deliveries are declared upon delivery to the system.

[5] For survey purposes, individual condominiums and townhomes were grouped according to identifiable home owner's associations to form Multi-family complexes. Additionally, for setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. The LUC affected by this last assumption are: 1188, 1190, 1201, 1202, 1203, and 1204. If this assumption were relaxed, the total number of properties would be 18,740.

[6] The number of properties listed for land use codes 1132, 1134 and 1136 include only those properties in Norristown and the 301-A municipalities because properties with these land use codes are included in the Single Family properties waste deliveries for the other municipalities.

[7] For setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. If this assumption were relaxed, the number of properties contained in each LUC ranges from one to 2,482.

total properties in each LUC, depending upon the number of properties in the group. That is, for LUC with a small number of properties a larger percentage of properties were targeted than for LUC with a larger number of properties. The objective of the sampling methodology was to ensure that a representative sample was obtained from LUCs with fewer properties. The minimum percentage of the total number of properties targeted to be surveyed in each LUC is shown in Table 2.

Table 2

Sampling Criteria

Number of Properties In LUC	Percentage or Number to be Sampled
= 1	100%
> 1 but < 10	50%
> 10 but < 50	35%
> 50 but < 100	25%
> or = 100	50 properties

The field survey was conducted on a randomly selected number of properties[8] within a minimum/maximum selection criterion. The percentage sampled in any group ranged from 20% to maximum of 50 properties for the largest groups, up to 100% for the smallest groups. The sampling methodology resulted in 2,968 properties being surveyed, including 2,192 Non-residential properties and 778[9] Multi-Family properties.

For field survey purposes, the Non-residential LUC has 7,763 combined properties with 84,577 total BSIs. Field surveys were completed for 2,192 Non-residential properties, or 28% of the population and the properties surveyed had 35,013 total BSIs, representing 41% of the population. Of the 2,093 Multi-family properties, 778 properties or 37% were sampled[10], representing 43% of the BSIs. The details of the sampling for each Business Group are shown in Tables 4 and 5.

[8] Some apartment building owners provided survey information and therefore, were not randomly chosen to do so. All other properties surveyed were randomly selected.

[9] For survey purposes, individual condominiums and townhomes were grouped according to identifiable home owner's associations to form Multi-family complexes. Additionally, for setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. The LUC affected by this last assumption are: 1188, 1190, 1201, 1202, 1203, and 1204. If this assumption were relaxed, the total number of Multi-Family properties sampled was 3,428 and the total number of all properties sampled was 5,620.

[10] For survey purposes, individual condominiums and townhomes were grouped according to identifiable home owner's associations to form Multi-family complexes. Additionally, for setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. The LUC affected by this last assumption are: 1188, 1190, 1201, 1202, 1203, and 1204. If this assumption were relaxed, the total number of Multi-Family properties sampled was 3,428, representing 31% of the properties.

3.3 Training and Field Activities

Before commencement of field activities, training seminars were conducted to familiarize project personnel with procedural requirements used for the project. A total of eight survey technicians were trained during the training seminars. During the training sessions, eight survey technicians, two members of the project team, and six Waste Authority staff members and/or consultants were instructed on survey procedures.

The training seminars presented an overview of the typical container types and sizes to be observed during the survey. The training seminars also educated survey team members on techniques to identify different waste types disposed by the survey properties and the appropriate data collection methods to account for Acceptable Waste and Non-Acceptable Waste. Most of waste disposal by each property surveyed was municipal waste; however, other non-municipal wastes such as construction and demolition (C&D) debris and Form S waste (municipal-like residual waste) are produced by generators. For properties doing major remodeling, C&D debris may be disposed in an additional (temporary) container found on-site. Survey team members were instructed to identify these containers that may be on-site, and to decide if they should be included (Form S waste) or excluded (C&D waste) from the survey data. It should be noted that although Form S waste data was collected during the survey, it was not included in the data used to estimate waste generation.

All survey team members were provided a complete list of the Waste Authority's assessed properties and stated sampling guidelines. The list included the property address and LUC for each property to be surveyed. Periodically, completed survey forms were scrutinized to identify inaccurate, incomplete, or imprecise data. Problems encountered during sampling process were discussed and resolved with all team members.

Data collected by the survey team members were recorded on a Waste Generation Property Survey Form. Upon arrival at a property, the survey team member introduced himself/herself and requested to speak with the property contact. The survey team member gave the property contact a letter from the Waste Authority providing a general overview of the Waste Generation Study. Information contained on the Waste Generation Survey Form was gathered during the interview.

If the property contact was not available, the survey team member interviewed an alternate employee who had knowledge of refuse collection and disposal for the property. If no informed personnel were available, the survey team member recorded as much information as possible by inspecting the property, locating containers, and obtaining the telephone number of an informed property contact. The remaining or missing data was collected by a telephone interview with the property contact. During a survey, three sets of data were gathered, survey information, property identification information, and waste specific information.

4.0 ESTIMATING WASTE GENERATION

4.1 Waste Generation Based Upon Historic Deliveries

The estimate of all residential (i.e., Single Family) and commercial (i.e., Multi-family and Non-residential) waste in the participating communities, shown in Exhibit 4, is based upon historic deliveries during the years 2001 through 2006. The deliveries for the year 2006 reflect actual deliveries for the period January 2006 through June 2006, converted to an annual basis based on the Waste Authority's annualization factor of 48.7%. The average deliveries of residential waste for the Participating Municipalities are the basis by which the Single Family Residential Waste Generation Fee is allocated.

4.2 Waste Generation Based Upon Waste Generation Surveys

An independent estimate of waste generation for properties receiving commercial collection (i.e., Multi-family Residential and Non-residential properties) that are assessed directly by the Waste Authority, was prepared using waste surveys and the Waste Authority's assessment records. Thirty percent of the properties were surveyed representing 42% of the total BSIs[14]. The order of the Business Groups' rate of generation from high waste generators to low generators is similar to the Last Four Studies and the Comparison Waste Generation Studies. Restaurants, and Supermarkets are at the high end of the scale, while Religious Institutions, and Schools were found to be low generators of waste, when allocated on a square foot basis. The largest generator of waste by Business Group is Manufacturing/Warehousing with estimated tonnage of 42,368. Other Business Groups exceeding 20,000 tons per year of waste generation are Office Buildings (including Gov't.), and Other Retail, Small Stores, and Multi-Use.

4.3 Allocating Waste Generation for Residential Properties

Residential property waste generation is classified into one of two groups: (1) Single Family Residential and; (2) Multi-family Residential. Each group is constructed based upon the Montgomery County Board of Assessment records and the Waste Authority's assessment records according to their LUC.

[14] For survey purposes, individual condominiums and townhomes were grouped according to identifiable home owner's associations to form Multi-family complexes. Additionally, for setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. The LUC affected by this last assumption are: 1188, 1190, 1201, 1202, 1203, and 1204. If this assumption were relaxed, 30% of the properties were surveyed representing 42% of the total BSIs.

3.5 Survey Quality Control

To verify the accuracy and completeness of the survey program, Year 2006 Surveys properties that could be contacted were contacted via the telephone. Of these, approximately 1,116 surveys with complete information were collected through June 2006. This amount included individual surveys that covered a number of properties such as a commercial condominium building. In total, 1,116 individual surveys were completed and 163 (15%) quality assurance/control calls were completed. A similar quality assurance program was utilized in 2004 to verify the accuracy and completeness of the Year 2004 Surveys. At that time, approximately 725 surveys with complete information were collected and 61 (8%) quality assurance/control calls were completed on the Year 2004 Surveys.

It was recognized that, on occasion, multiple properties would use a single location to set-out waste for collection. In an attempt to distinguish between multiple properties using a single set-out point, survey personnel used a two-part screening procedure: (1) identification of multiple property set-outs disposed at the same disposal container and; (2) classifying the land use type for each property.

3.4 Results of the Field Survey

The field survey was conducted on a randomly selected number of properties[11] within the minimum/maximum selection criteria. Through June 2006, 2,968 completed property surveys were included in the year 2006 waste generation database[12]. There are two components comprising the waste generation database, surveys conducted in 2004 for the Waste Authority's 2004 Study (Year 2004 Surveys), and new surveys conducted between November 2005 and June 2006 (Year 2006 Surveys), as shown on Exhibit 2.

In 2004, Gannett Fleming and the Waste Authority's personnel conducted waste generation surveys, Year 2004 Surveys, as part of the 2004 Study. In total, 1,492 Year 2004 Surveys were utilized. The Year 2004 Surveys were reviewed, and where complete information existed, were added to the database available for this project. In total, 1,492 Original surveys with complete information were added to the database. To meet the field survey minimum/maximum criteria, a total of 610 Year 2006 Surveys was required. In total, 1,476 Year 2006 Surveys were completed and added to the database. In July 2006, the waste generation database contained the data from 2,968 completed surveys and consisted of 1,492 Year 2004 Surveys, and 1,476 Year 2006 Surveys[13].

Exhibit 3 provides a list of the number of properties surveyed within each Participating Municipality. It should be noted that the percentage of properties assessed shown in Exhibit 3 include all properties assessed and therefore, does not group any Multi-family properties discussed previously.

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[11] Some apartment building owners provided survey information and therefore, were not randomly chosen to do so. All other properties surveyed were randomly selected.

[12] For survey purposes, individual condominiums and townhomes were grouped according to identifiable home owner's associations to form Multi-family complexes. Additionally, for setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. The LUC affected by this last assumption are: 1188, 1190, 1201, 1202, 1203, and 1204. If this assumption were relaxed, the total number of properties sampled was 5,620.

[13] For survey purposes, individual condominiums and townhomes were grouped according to identifiable home owner's associations to form Multi-family complexes. Additionally, for setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. The LUC affected by this last assumption are: 1188, 1190, 1201, 1202, 1203, and 1204. If this assumption were relaxed, the waste generation database contains the data from 5,620 completed property surveys.

Many factors influence the rate of waste generation for both residential and non-residential properties. These factors may include population, income levels, occupancy rates, opportunities for recycling, housing characteristics, and many others. Accordingly, comparisons of data from different periods, different parts of the county and based on varying measures of generation (e.g., lbs/person, tons/employee, or tons/single-family dwelling) were viewed as general trends and not as absolute measures.

A Single Family Residential property waste generation rate of 1.637 tons is within the range of the generation rates found in the Comparison Waste Generation Studies and greater than the rate found in the Last Four Studies. The Comparison Waste Generation Studies show a range of generation rates of 1.10 tons to 1.95 tons (when vegetation waste is excluded or included), the 1998 Study concluded 1.30, the 2000 Study found 1.47, the 2002 Study concluded 1.54 and the 2004 Study determined 1.65.

The recommended allocation of the Waste Generation Fee for Single Family Residential property is based upon 1.637 tons of waste generation. A Single Family Residential WGC of 1.637 tons is reasonable when compared with the results of the Last Four Studies and the Comparison Waste Generation Studies for residential waste generation. Therefore, an average Single Family Residential WGC of 1.637 tons is used to estimate waste generation for each Waste Authority assessed Single Family property, shown in Exhibit 5. Based upon the historical deliveries, 175,622 tons of waste generation is estimated for allocation to the Single Family Residential property owners as shown in Exhibit 5.

4.3.2 Allocation for Multi-family Residential Properties

A BSI based upon the number of dwelling units at each property is assigned to depict the size and waste generation of each Multi-family Residential property. By doing so, waste generation per BSI is estimated for each Multi-family Residential property.

For field survey purposes, the Multi-family Residential LUC properties comprise Business Groups 50 and 51. Reviewing Montgomery County Board of Assessment records and the Waste Authority's assessment records has established the land use for each assessed Multi-family Residential real property owner. The Multi-family Residential properties were sampled according to LUC and then grouped according to generation rate and type of business, based on LUC, into two Business Groups. The Business Groups were created for allocating the Waste Generation Fees.

In total, The Multi-family Business Groups have 2,093 combined properties with 39,286 total dwelling units or BSIs as shown in Table 4. The combined properties comprising the Multi-family Business Groups represent properties such as identical single address condominiums, townhomes and other small apartment like properties with identical street addresses (Business Group 50) and multi unit high rise complexes (Business Group 51). Waste Generation Surveys were completed for 778 Multi-family

Table 4

Waste Authority of Eastern Montgomery County

Percentage of Properties Surveyed and Estimated Rates of Waste Generation
Mult-family Properties

Survey Results	Business Group 50 Multi-Family	Business Group 51 Multi-Family High Rise	Total All Multi-Family
Based on Authority's Sampling Assessment Records (1)			
Authority's Assessment Records			
Number of Properties	1,706	387	2,093
BSIs	10,745	28,541	39,286
Surveyed Properties			
Number of Properties	600	178	778
BSIs	3,580	13,364	16,944
Rate of Generation	0.872	0.569	0.652
Percent Surveyed			
Number of Properties	35%	46%	37%
BSIs	33%	47%	43%
Tons of Generation	9,366	16,240	25,606
Based on Actual Number of Multi-Family Properties (1)			
Actual Assessment Records			
Number of Properties	6,905	4,072	10,977
BSIs	10,745	28,541	39,286
Actual Surveyed Properties			
Number of Properties	1,472	1,956	3,428
BSIs	3,580	13,364	16,944
Percent Surveyed			
Number of Properties	21%	48%	31%
BSIs	33%	47%	43%

Note: (1) For survey purposes, individual condominiums and townhomes were grouped according to identifiable home owner's associations to form Multi-family complexes. Additionally, for setting sampling goals of visiting property locations, each condominium or townhome location that had not been grouped to form a complex, was grouped together in 60 individual units based upon the 1998 Study. The LUC affected by this last assumption are: 1188, 1190, 1201, 1202, 1203, and 1204.

Residential properties' total estimated tons by the Waste Generation Fee produces their total Waste Generation Fee.

4.4 Allocating Waste Generation for Non-residential Properties

Reviewing Montgomery County Board of Assessment records and the Waste Authority's assessment records has established the land use for each assessed Non-residential real property owner. The Non-residential properties were sampled according to LUC and then grouped according to generation rate and type of business, based on LUC, into 45 Business Groups. The Business Groups were created for allocating the Waste Generation Fees. The BSI, based on the square footage of net floor area, is the basis of allocating the Waste Generation Fee for assessed Non-residential properties. For each Business Group, the weighted average rate of waste generation of the assessed property by LUC, determined through the field survey, is the basis of estimating the total waste generation.

Reviewing Montgomery County Board of Assessment records and the Waste Authority's assessment records established the square footage of net floor area of all waste generating Non-residential property. For properties with square footage above 999 feet, the square footage of net floor area is divided by 2,000 and rounded to the nearest whole number to produce a BSI unit for each property. All properties with less than 500 square feet are assigned a BSI unit of 0.13. A BSI unit of 0.38 is assigned to all properties with square footage between 500 and 999 feet.

For field survey purposes, the Non-residential properties comprise Business Groups 1 through 45. In total, Non-residential Business Groups have 7,763 combined properties with 84,577 total BSIs as shown in Table 5. Waste Generation Surveys were completed for 2,192 Non-residential properties, or 28% of the population. The properties surveyed had 35,013 total BSIs, representing 41% of the population. In the instances where sampling was not available for a LUC, the weighted average generation rate of the LUCs' comprising the Business Group was utilized.

As shown on Table 5, a weighted average rate of waste generation per BSI was calculated for each Non-residential Business Group. The weighted average rate of waste generation per BSI was calculated by dividing the total estimated tons of waste generation for each Business Group by their total BSIs. The weighted average rate of waste generation per BSI is reported in tons per BSI. However, this unit of measure is approximately equal to pounds per square foot because the BSIs were originally created by dividing the actual square footage by 2,000.

As in the Comparison Waste Generation Studies, the Last Four Studies, the standard deviation of the waste generation rates in the database varies widely around the arithmetic average. Often, the standard deviation is greater than the arithmetic average. This is primarily the result of the fact that the relationship between total waste generation and BSI is usually not linear. That is, within a given Business Group, the rate of generation usually decreases with each additional BSI. Therefore, the weighted average rate of waste generation per BSI is more appropriate than the arithmetic average, which weighs both small and large properties equally.

For each Business Group, the weighted average rate of waste generation determined through the field survey is the basis of estimating the total waste generation for the Non-residential properties. As shown in Table 5, 171,222 tons are estimated for all Non-residential properties.

The results of the field surveys show an estimated waste generation range of 0.192 tons to 27.227 tons per BSI for the Non-residential Business Groups. The weighted average rate of waste generation for all Non-residential properties is 2.024 tons per BSI. Different factors influence the rate of waste generation for Non-residential properties. Comparisons of data from the Comparison Waste Generation Studies from different periods, different parts of the county and based on varying measures of generation should be viewed as general trends and not as absolute measures. As a generalization, the estimated waste generation rates for the Business Groups based on the field surveys are at the lower end of the ranges from the Comparison Waste Generation Studies. The Comparison Waste Generation Studies show a range of weighted average rate generation rates of 3.93 pounds per square foot to 5.38 pounds per square foot. The 1998 Study found a weighted average rate of waste generation for all Non-residential properties of 1.98 pounds per square foot, the 2000 Study found 2.18 pounds per square foot, the 2002 Study found 2.32 pounds per square foot and the 2004 Study found 2.07 pounds per square foot.

Each Business Group is assigned a Non-residential Waste Generation Classification (WGC) according to their estimated waste generation for assessment billing purposes. The assigned Non-residential WGC represents the weighted average of the range of estimated waste generation for a number of Business Groups. The minimum and maximum range of each Non-residential WGC begins (ends) with the minimum (maximum) range of the bordering WGC. The data collected during the field survey determined the exact number of different Non-residential WGCs to be assigned.

The Non-residential waste generation rates have been ranked from lowest generation rates to highest, as shown in Table 6. The ranked generation data was grouped into broader categories for general or broad allocation purposes. The Non-residential Business Groups have been grouped into eight classifications based upon a review of the data. The assigned breaks that group the Business Groups reflected the goal to use the natural breaks in the generation rate data.

Table 6

Waste Authority of Eastern Montgomery County

Sorted Rates of Waste Generation and Development of the Waste Generation Classification
For Non-Residential Properties

Business Group	BSIs	Tons of Generation	Rate of Generation	% Change In Rate of Generation	Assigned WGC	Allocated Tons	Development of WGC Rate
33 Parking Lots and Garages	93	18	0.192		0.867	81	
43 Warehouse	803	587	0.731	281%	0.867	696	
11 Places of Worship	3,224	2,414	0.749	2%	0.867	2,795	
19 Health and Other Fitness Related Centers	350	281	0.801	7%	0.867	304	
44 Utilities, Authorities	614	525	0.856	7%	0.867	532	
12 Religious Community	623	550	0.883	3%	0.867	540	WGC Class A
9 Schools-Primary, Secondary, Special Purpose	7,142	6,497	0.910	3%	0.867	6,192	WGC Rate 0.867
10 University and College	1,193	1,093	0.916	1%	0.867	1,034	
13 Charities and Religious Organizations	426	392	0.919	0%	0.867	370	
6 Hotel without Restaurant	856	804	0.940	2%	0.867	742	
21 Parks\Recreation\Swimming Areas	85	82	0.967	3%	0.867	73	
18 Other Institutions	914	910	0.996	3%	0.867	792	
16 Hospitals\Medical Facilities	3,349	3,609	1.078	8%	1.236	4,140	
7 Office Building (including Gov't)	23,339	26,720	1.145	6%	1.236	28,847	
5 Hotel\Motel and Restaurant	785	1,002	1.277	12%	1.236	970	
17 Fire and Ambulance Halls	242	317	1.310	3%	1.236	299	WGC Class B
22 Skating Rinks\Bowling Alleys\Theaters	205	269	1.312	0%	1.236	253	WGC Rate 1.236
24 Large\Department Stores	1,811	2,649	1.463	12%	1.236	2,238	
39 Auto Dealers without Repair Centers	735	1,150	1.564	7%	1.236	908	
8 Nursery and Preschool	206	324	1.571	0%	1.236	255	
15 Retirement\Nursing Homes	2,958	5,533	1.871	19%	1.236	3,656	
37 Miscellaneous	376	758	2.015	8%	2.427	914	
26 Malls	3,582	7,540	2.105	4%	2.427	8,694	
30 Banks	325	687	2.114	0%	2.427	789	
38 Other Retail, Small Stores and Multi-Use	7,071	15,487	2.190	4%	2.427	17,162	WGC Class C
31 Commercial Post Offices	8	18	2.305	5%	2.427	19	WGC Rate 2.427
25 Shopping Centers\Strip Stores	1,009	2,515	2.493	8%	2.427	2,448	
34 Medical, Dental\Veterinary Centers	601	1,530	2.548	2%	2.427	1,457	
42 Manufacturing\Warehousing	16,247	42,368	2.608	2%	2.427	39,432	
28 Drug \ Dairy Stores	2	6	2.925	12%	2.427	5	
29 Home\Lumber Centers	222	688	3.097	6%	3.706	823	
41 Truck Terminals\Fuel Distribution	222	728	3.272	6%	3.706	824	WGC Class C
14 Cemeteries	85	317	3.711	13%	3.706	316	WGC Rate 2.427
40 Auto Service Centers\Car Wash	1,030	4,046	3.930	6%	3.706	3,816	
32 Gas Stations (only)	141	726	5.136	31%	5.222	738	
35 Nurseries	34	179	5.204	1%	5.222	180	WGC Class E
20 Golf Course	501	2,622	5.235	1%	5.222	2,616	WGC Rate 5.222
23 Exhibition and Convention Centers	1	5	5.235	0%	5.222	5	
36 Contractor Facilities	104	552	5.287	1%	5.222	545	
45 Supermarkets\Major Food Shopping Centers	2,402	24,106	10.036	90%	10.036	24,106	WGC Class F WGC Rate 10.036
2 Restaurant\Small Hotel without Liquor License	73	959	13.179	31%	14.494	1,055	
1 Restaurant with Liquor License	259	3,608	13.922	6%	14.494	3,756	WGC Class G
4 Bar \ Hotel Bar	150	2,164	14.457	4%	14.494	2,170	WGC Rate 14.494
27 Convenience and Mini Market	95	1,623	17.120	18%	14.494	1,374	
3 Fast Food\Diner Restaurant	83	2,264	27.227	59%	27.228	2,264	WGC Class H WGC Rate 27.228
Totals	84,577	171,222	2.024		2.024	171,225	

Study is equal to about 96% of the actual tons delivered by the Participating Municipalities during the current year, 2006[17]. These results indicate the Waste Generation Studies provide a reasonably reliable projection of the amount of waste generated in the Participating Municipalities and, in our opinion, a reasonable and uniform basis of allocating the Waste Generation Fee.

Table 7

Waste Authority of Eastern Montgomery County

Comparison of the Waste Generation Studies Estimated Tonnage
Verses Actual Tonnage Deliveries From the 22 Participating Municipalities

Waste Generation Study Year	Waste Generation Fee System	Residential Tonnage	Commercial Tonnage	Total Tonnage
1998 Study - Estimated Tonnage	Zero Tip Fee	163,302	180,289	343,591
Vs.				
Average Actual Tonnage 1999-2000		166,629	202,839	369,468
2000 Study - Estimated Tonnage	Market Based Fee	166,485	188,394	354,879
Vs.				
Average Actual Tonnage 2001-2002		174,011	188,010	362,021
2002 Study - Estimated Tonnage	Market Based Fee	170,280	192,017	362,297
Vs.				
Average Actual Tonnage 2003-2004		182,769	188,474	371,243
2004 Study - Estimated Tonnage	Market Based Fee	176,498	190,116	366,614
Vs.				
Average Actual Tonnage 2005-2006*		177,420	210,288	387,708
2006 Study - Estimated Tonnage	Market Based Fee	175,622	197,021	372,643
Vs.				
Actual Tonnage 2006*		177,585	210,069	387,654

* - Annualized deliveries from January 2006 through June 30, 2006.

Waste Authority's annualization factor of 48.7%

[17] Id.,

5.0 CLARIFICATIONS AND COMPARISONS

5.1 Vacancies

The waste generation rates presented in this study reflect the level of vacancies that existed at the time each survey was completed. For example, when an office building, shopping center or apartment building was sampled, the BSI of the entire property was used, regardless of vacancy. However, the waste generation of the property reflected the degree to which the property was occupied. Accordingly, the waste generation rates or waste generation per BSI reflects the vacancy of the properties surveyed. Therefore, vacancies should not be appealable except extreme vacancies that differ from the LUCs studied.

5.2 Changes In Waste Generation

This report provides an estimate of the waste generation capacity of the Participating Municipalities based primarily upon the properties that were being assessed a Waste Generation Fee by the Waste Authority as of May 1, 2006. The Waste Authority's assessment records reflect, in part, information obtained from the Montgomery County Board of Assessment at year-end 2005 and update changes to May 2006. Therefore, all appeals granted by the Waste Authority for the year 2006 and changes made by the Montgomery County Board of Assessment during the year 2006 might not be included in this estimate of the waste generation capacity of the Participating Municipalities. All appeals granted, that was not indicated to be temporary or to expire prior to 2008, and municipal adjustments made during the period 1998 through 2005 have been included in the calculation of waste generation.

5.2.1 Population Growth

Changes in the population of the Participating Municipalities should affect their residential waste generation. Table 8 shows the population growth estimates of the MCPC.

Table 8

Montgomery County

Annual Percent Change in Population

	2005	2006	2007	2008	2009
22 Participating Municipalities	0.2	0.1	0.1	0.1	0.1
40 Nonparticipating Municipalities	1.3	1.1	1.1	1.1	1.0
Montgomery County Totals	0.7	0.6	0.6	0.6	0.5

The population growth in the Participating Municipalities is close to zero while the growth in the other 40 municipalities that comprise Montgomery County is about 1.1%. Therefore, other than the changes in precipitation or the waste generation habits of existing residences, the residential waste generation of the

Participating Municipalities should not vary much from year to year.

5.2.2 Commercial Growth

As was the case with population, changes in the employment within the Participating Municipalities should affect commercial waste generation. Table 9 shows the employment growth estimates of the MCPC.

Table 9

Montgomery County

Annual Percent Change in Employment

	2005	2006	2007	2008	2009
22 Participating Municipalities	0.3	0.9	0.9	0.9	0.9
40 Nonparticipating Municipalities	0.8	1.4	1.4	1.4	1.4
Montgomery County Totals	0.5	1.1	1.1	1.1	1.0

As shown in Table 9, the employment growth in the Participating Municipalities is estimated to be 0.9%, while the growth in the other 40 municipalities that comprise Montgomery County is estimated to be 1.4%. Therefore, other than the changes in precipitation or the waste generation habits of existing businesses and associated employees, the commercial waste generation of the Participating Municipalities should grow by less than 1.0% annually.

5.3 Confirming Residential Waste Generation

Nationally, the average residential waste generation habit in the U.S. is about 1,000 pounds per person per year. Multiplying MCPS's 2006 population estimate of 420,814 for the Participating Municipalities by the national average residential waste generation habits suggests 210,407 residential tons (420,814x 1,000 = 420,814,000 ÷ 2,000 = 210,407 tons) could be generated in the Participating Municipalities. This current Waste Generation Study identifies and allocates 200,912 residential tons (175,622 Single Family Residential tons and 25,290 Multi-Family Residential tons) or 95% of the national average. Comparisons of data from different periods, different parts of the county and based on varying measures of generation should be viewed as general trends and not as absolute measures. Various elements including weather, recycling habits and social-economic factors affect residential waste generation rates. Therefore, as a generalization, the estimated residential waste generation rates found in the Participating Municipalities are in line with the national average.

5.4 Confirming Commercial Waste Generation

This current Waste Generation Study identifies and allocated 197,021 tons of commercial waste (25,290 Multi-Family Residential tons and 171,731 Non-residential tons) in the Participating Municipalities.

Dividing the total commercial waste generation by MCPS's 2006 employment estimate of 324,479 for the Participating Municipalities show 0.61 tons per employee. A similar rate of commercial waste generation per employee was found in the Last Four Studies. Moreover, it is line with national waste generation averages based on employment.

5.5 Changes in Non-residential Waste Generation

Table 10 presents a comparison of the Non-residential waste generation rates found in the 2004 Study and those discussed in this report. Changes in each Business Groups' waste generation rate can be attributed to revised sampling, and actual changes in a property's waste generation. Of the 45 Non-residential Business Groups studied, 15 of the Non-residential Business Groups, or 33%, showed an increase in generation rates and 29 (64%) showed a decrease in WGC class. The largest increases in WGC Rates were found for the Supermarkets\Major Food Shopping Centers and for Golf Course, 27% and 19% respectively. The Parking Lots and Garages and Parks\Recreation\Swimming Areas had the largest decreases of -85% and -51% respectively. In total, the weighted average waste generation rate changes from 2.07 in the 2004 Study to 2.02 tons per BSI.

5.6 Changes in Waste Generation Classifications

This report recommends the use of eleven WGCs. The 1998 Study recommended eight WGCs, the 2000 Study promoted nine WGCs and both the 2002 Study and 2004 Study recommended eleven WGC. On average the WGCs show a 6% increase. Six of the WGCs show an increase in generation rate and four shows a decrease. Table 11 provides a comparison of the changes in WGC since the 2004 Study.

Table 10

Waste Authority of Eastern Montgomery County

Comparison of Non-residential Generation Rates and WGC Class

Business Group	2004 Study			Current 2006 Study			Percent Changed		Change In
	Rate of Generation	WGC Rate	WGC Class	Rate of Generation	WGC Rate	WGC Class	WGC Class	WGC Rate	WGC Class
1 Restaurant with Liquor License	12.841	14.284	G	13.922	14.494	G	8%	1%	Unchanged
2 Restaurant\Small Hotel without Liquor License	18.920	14.284	G	13.179	14.494	G	-30%	1%	Unchanged
3 Fast Food\Diner Restaurant	34.721	34.720	H	27.227	27.228	H	-22%	-22%	Unchanged
4 Bar \ Hotel Bar	13.105	14.284	G	14.457	14.494	G	10%	1%	Unchanged
5 Hotel\Motel and Restaurant	1.887	1.301	B	1.277	1.236	B	-32%	-5%	Unchanged
6 Hotel without Restaurant	0.873	0.942	A	0.940	0.867	A	8%	-8%	Unchanged
7 Office Building (including Gov't)	1.176	1.301	B	1.145	1.236	B	-3%	-5%	Unchanged
8 Nursery and Preschool	1.714	1.301	B	1.571	1.236	B	-8%	-5%	Unchanged
9 Schools-Primary, Secondary, Special Purpose	0.990	0.942	A	0.910	0.867	A	-8%	-8%	Unchanged
10 University and College	0.858	0.942	A	0.916	0.867	A	7%	-8%	Unchanged
11 Places of Worship	0.860	0.942	A	0.749	0.867	A	-13%	-8%	Unchanged
12 Religious Community	1.153	1.301	B	0.883	0.867	A	-23%	-33%	Down 1
13 Charities and Religious Organizations	1.316	1.301	B	0.919	0.867	A	-30%	-33%	Down 1
14 Cemeteries	3.332	3.272	D	3.711	3.706	D	11%	13%	Unchanged
15 Retirement\Nursing Homes	2.235	2.243	C	1.871	1.236	B	-16%	-45%	Down 1
16 Hospitals\Medical Facilities	0.990	0.942	A	1.078	1.236	B	9%	31%	Up 1
17 Fire and Ambulance Halls	1.762	1.301	B	1.310	1.236	B	-26%	-5%	Unchanged
18 Other Institutions	1.148	1.301	B	0.996	0.867	A	-13%	-33%	Down 1
19 Health and Other Fitness Related Centers	0.731	0.942	A	0.801	0.867	A	10%	-8%	Unchanged
20 Golf Course	4.398	4.516	E	5.235	5.222	E	19%	16%	Unchanged
21 Parks\Recreation\Swimming Areas	1.976	1.301	B	0.967	0.867	A	-51%	-33%	Down 1
22 Skating Rinks\Bowling Alleys\Theaters	1.443	1.301	B	1.312	1.236	B	-9%	-5%	Unchanged
23 Exhibition and Convention Centers	5.442	4.516	E	5.235	5.222	E	-4%	16%	Unchanged
24 Large\Department Stores	1.408	1.301	B	1.463	1.236	B	4%	-5%	Unchanged
25 Shopping Centers\Strip Stores	2.659	2.243	C	2.493	2.427	C	-6%	8%	Unchanged
26 Malls	1.951	1.301	B	2.105	2.427	C	8%	87%	Up 1
27 Convenience and Mini Market	16.450	14.284	G	17.120	14.494	G	4%	1%	Unchanged
28 Drug \ Dairy Stores	2.925	2.243	C	2.925	2.427	C	0%	8%	Unchanged
29 Home\Lumber Centers	4.618	4.516	E	3.097	3.706	D	-33%	-18%	Down 1
30 Banks	2.031	2.243	C	2.114	2.427	C	4%	8%	Unchanged
31 Commercial Post Offices	2.383	2.243	C	2.305	2.427	C	-3%	8%	Unchanged
32 Gas Stations (only)	6.375	4.516	E	5.136	5.222	E	-19%	16%	Unchanged
33 Parking Lots and Garages	1.274	1.301	B	0.192	0.867	A	-85%	-33%	Down 1
34 Medical, Dental\Veterinary Centers	3.007	3.272	D	2.548	2.427	C	-15%	-26%	Down 1
35 Nurseries	5.276	4.516	E	5.204	5.222	E	-1%	16%	Unchanged
36 Contractor Facilities	4.608	4.516	E	5.287	5.222	E	15%	16%	Unchanged
37 Miscellaneous	2.422	2.243	C	2.015	2.427	C	-17%	8%	Unchanged
38 Other Retail, Small Stores and Multi-Use	3.288	3.272	D	2.190	2.427	C	-33%	-26%	Down 1
39 Auto Dealers without Repair Centers	1.929	1.301	B	1.564	1.236	B	-19%	-5%	Unchanged
40 Auto Service Centers\Car Wash	4.236	4.516	E	3.930	3.706	D	-7%	-18%	Down 1
41 Truck Terminals\Fuel Distribution	3.404	3.272	D	3.272	3.706	D	-4%	13%	Unchanged
42 Manufacturing\Warehousing	2.225	2.243	C	2.608	2.427	C	17%	8%	Unchanged
43 Warehouse	0.914	0.942	A	0.731	0.867	A	-20%	-8%	Unchanged
44 Utilities, Authorities	1.633	1.301	B	0.856	0.867	A	-48%	-33%	Down 1
45 Supermarkets\Major Food Shopping Centers	7.873	7.873	F	10.036	10.036	F	27%	27%	Unchanged

Table 11

Waste System Authority of Eastern Montgomery County

Changes in WGC Rates

2006 WGC Class	2004-05 Old Rate	2006 Study Proposed Rate	Type of Property	Percent Change In WGC Rate
A	0.942	0.867	Non Residential	-8%
B	1.301	1.236	Non Residential	-5%
C	2.243	2.427	Non Residential	8%
D	3.272	3.706	Non Residential	13%
E	4.516	5.222	Non Residential	16%
F	7.873	10.036	Non Residential	27%
G	14.284	14.494	Non Residential	1%
H	34.720	27.228	Non Residential	-22%
M	0.661	0.872	Multi-family	32%
N	0.569	0.569	Multi-family	0%
S	1.649	1.637	Single Family	-1%

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 1

EXHIBIT 1

Gannett Fleming

Montgomery County Land Use Codes

LU Code	Description
0319	PREFERENTIAL ASSESSMENT
0515	PREFERENTIAL ASSESSMENT
1000	MISCELLANEOUS
1001	HOUSE ONLY, NO LAND
1002	LAND ONLY, BLDG ASSESSED SEPARATELY
1003	OPEN SPACE/COMMON AREA
1004	COMMON AREA - AMENITIES
1005	DETENTION BASIN
1006	SUBSIDIZED SINGLE FAMILY DETACHED
1101	SINGLE FAMILY
1105	SINGLE DWELLING GARAGE APT
1106	BOARDED-UP HOUSE
1108	MORE THA 1 HOUSE, DETACHED
1110	GARAGE ON LOT
1111	POOL ON LOT
1112	POLE BLDG, STABLE, BARN, ETC
1113	TENNIS COURT ON LOT
1116	HOUSE WITH IN-LAW SUITE
1132	DUPLEX
1134	TRIPLEX
1136	QUADRAPLEX
1140	RESIDENTIAL CONVERSION 5 OR MORE AP
1145	ROOMING HOUSE - TOURIST HOME
1160	RESIDENTIAL-COMMERCIAL NON-CONFORM
1161	RESIDENTIAL/PROFESSIONAL
1175	CONDOMINIUM:SINGLE DETACHED
1188	CONDO TOWNHOUSE
1189	CONDOMINIUM CLUSTER 2-5 UNITS
1190	CONDOMINIUM - 2-4 UNITS
1200	CONDO GARAGE
1201	CONDO GARDEN STYLE-PRIVATE ENT. 1-3
1202	CONDO GARDEN STYLE-COMMON ENT. 1-3S
1203	CONDOMINIUM MID RISE 4-6 STORIES
1204	CONDOMINIUM HIGH RISE 7 + STORIES
1220	MOBILE HOME - OWNER'S LOT
1221	MOBILE HOME - RENTED LOT - PARK
1222	MANUFACTURED HOME - RENTED LOT
1270	SEASONAL DWELLING
1901	EXEMPT DWELLING VETERANS
2000	NO ZONE VAC LAND ASS'D IN OTHER MUN
2001	NO ZONE VAC LAND UNDER 5000 SQ FT
2002	NO ZONE VAC LAND 5000-10000 SQ FT
2003	NO ZONE VAC LAND 10001-20000 SQ FT
2004	NO ZONE VAC LAND 20001-30000 SQ FT
2005	NO ZONE VAC LAND 30001-40000 SQ FT
2006	NO ZONE VAC LAND 40001-60000
2007	NO ZONE VAC LAND 60001-87120
2008	NO ZONE VAC LAND 2.00-4.99 ACRES
2009	NO ZONE VAC LAND 5.00-9.99 ACRES
2010	NO ZONE VAC LAND 10.00-19.99 ACRES
2011	NO ZONE VAC LAND 20.00-29.99 ACRES
2012	NO ZONE VAC LAND 30.00-39.99 ACRES
2013	NO ZONE VAC LAND 50.00+ ACRES
2100	RES VAC LAND ASS'D IN OTHER MUNC
2101	RES VAC LAND UNDER 5000 SQ FT
2102	RES VAC LAND 5000-10000 SQ FT
2103	RES VAC LAND 10001-20000 SQ FT
2104	RES VAC LAND 20001-30000 SQ FT
2105	RES VAC LAND 30001-40000 SQ FT
2106	RES VAC LAND 40001-60000 SQ FT
2107	RES VAC LAND 60001-87120 SQ FT
2108	RES VAC LAND 2.00- 4.99 ACRES
2109	RES VAC LAND 5.00- 9.99 ACRES
2110	RES VAC LAND 10.00-19.99 ACRES
2111	RES VAC LAND 20.00-29.99 ACRES
2112	RES VAC LAND 30.00-49.99 ACRES
2113	RES VAC LAND 50.00+ ACRES
2200	COM VAC LAND ASS'D IN OTHER MUNC
2201	COM VAC LAND UNDER 5000 SQ FT
2202	COM VAC LAND 5000-10000 SQ FT
2203	COM VAC LAND 10001-20000 SQ FT
2204	COM VAC LAND 20001-30000 SQ FT
2205	COM VAC LAND 30001-40000 SQ FT
2206	COM VAC LAND 40001-60000 SQ FT
2207	COM VAC LAND 60001-87120 SQ FT
2208	COM VAC LAND 2.00- 4.99 ACRES
2209	COM VAC LAND 5.00- 9.99 ACRES
2210	COM VAC LAND 10.00-19.99 ACRES

LU Code	Description
2211	COM VAC LAND 20.00-29.99 ACRES
2212	COM VAC LAND 30.00-49.99 ACRES
2213	COM VAC LAND 50.00+ ACRES
2300	IND VAC LAND ASS'D IN OTHER MUNC
2301	IND VAC LAND UNDER 5000 SQ FT
2302	IND VAC LAND 5000-10000 SQ FT
2303	IND VAC LAND 10001-20000 SQ FT
2304	IND VAC LAND 20001-30000 SQ FT
2305	IND VAC LAND 30001-40000 SQ FT
2306	IND VAC LAND 40001-60000 SQ FT
2307	IND VAC LAND 60001-87120 SQ FT
2308	IND VAC LAND 2.00- 4.99 ACRES
2309	IND VAC LAND 5.00- 9.99 ACRES
2310	IND VAC LAND 10.00-19.99 ACRES
2311	IND VAC LAND 20.00-29.99 ACRES
2312	IND VAC LAND 30.00-49.99 ACRES
2313	IND VAC LAND 50.00+ ACRES
2400	WOOD/REC/AGR ASS'D IN OTHER MUNC
2401	WOOD/REC/AGR UNDER 5000 SQ FT
2402	WOOD/REC/AGR 5000-10000 SQ FT
2403	WOOD/REC/AGR 10001-20000 SQ FT
2404	WOOD/REC/AGR 20001-30000 SQ FT
2405	WOOD/REC/AGR 30001-40000 SQ FT
2406	WOOD/REC/AGR LAND 40001-59999 SQ FT
2407	WOOD/REC/AGR LAND 60001-87120 SQ FT
2408	WOOD/REC/AGR LAND 2.00- 4.99 ACRES
2409	WOOD/REC/AGR LAND 5.00- 9.99 ACRES
2410	WOOD/REC/AGR LAND 10.00-19.99 ACRES
2411	WOOD/REC/AGR LAND 20.00-29.99 ACRES
2412	WOOD/REC/AGR LAND 30.00-49.99 ACRES
2413	WOOD/REC/AGR LAND 50.00+ ACRES
2500	INST'L VAC ASS'D IN OTHER MUNC
2501	INST'L VAC LAND UNDER 5000 SQ FT
2502	INST'L VAC LAND 5000-10000 SQ FT
2503	INST'L VAC LAND 10001-20000 SQ FT
2504	INST'L VAC LAND 20001-30000 SQ FT
2505	INST'L VAC LAND 30001-40000 SQ FT
2506	INST'L VAC LAND 40001-60000 SQ FT
2507	INST'L VAC LAND 60001-87120 SQ FT
2508	INST'L VAC LAND 2.00- 4.99 ACRES
2509	INST'L VAC LAND 5.00- 9.99 ACRES
2510	INST'L VAC LAND 10.00-19.99 ACRES
2511	INST'L VAC LAND 20.00-29.99 ACRES
2512	INST'L VAC LAND 30.00-49.99 ACRES
2513	INST'L VAC LAND 50.00+ ACRES
2600	ADMIN OFC LND ASSD IN OTHER MUNC
2601	ADMIN'VE OFC LND UNDER 5000 SQ FT
2602	ADMIN'VE OFC LND 5000-10000 SQ FT
2603	ADMIN'VE OFC LND 10001-20000 SQ FT
2604	ADMIN'VE OFC LND 20001-30000 SQ FT
2605	ADMIN'VE OFC LND 30001-40000 SQ FT
2606	ADMIN'VE OFC LND 50001-59999 SQ FT
2607	ADMIN'VE OFC LAND 60001-87120 SQ FT
2608	ADMIN'VE OFC LAND 2.00- 4.99 ACRES
2609	ADMIN'VE OFC LAND 5.00- 9.99 ACRES
2610	ADMIN'VE OFC LAND 10.00-19.99 ACRES
2611	ADMIN'VE OFC LAND 20.00-29.99 ACRES
2612	ADMIN'VE OFC LAND 30.00-49.99 ACRES
2613	ADMIN'VE OFC LAND 50.00+ ACRES
2700	LANDFILL LAND ASSD IN OTHER MUNC
2701	LANDFILL VACANT LAND UNDER 5000 SQF
2702	LANDFILL VACANT LAND 5000-10000 SQF
2703	LANDFILL VACANT LAND 10001-20000 SF
2704	LANDFILL VACANT LAND 20001-30000 SF
2705	LANDFILL VACANT LAND 30001-40000 SF
2706	LANDFILL VACANT LAND 40001-60000 SF
2707	LANDFILL VACANT LAND 60001-87120 SF
2708	LANDFILL VAC LAND 5.00- 9.99 ACRES
2709	LANDFILL VAC LAND 5.00- 9.99 ACRES
2710	LANDFILL VAC LAND 10.00-19.99 ACRES
2711	LANDFILL VAC LAND 20.00-29.99 ACRES
2712	LANDFILL VAC LAND 30.00-49.99 ACRES
2713	LANDFILL VAC LAND 50.00+ ACRES
2800	REVERSE SUBDIVISION - NO LOT SIZE
2900	ASSESSED WITH
3000	IND:ONE STORY MISC./VARIED
3320	IND:ONE STORY WHSE/MFG UP TO 15000
3321	IND:MUL STORY WHSE/MFG UP TO 15000
3324	IND:MUL STORY WHSE/MFG 15-25000 S.F
3325	IND:ONE STORY WHSE/MFG 15-25000 S.F
3326	IND:MUL STORY WHSE/MFG 25-50000 S.F
3327	IND:ONE STORY WHSE/MFG 25-50000 S.F
3330	IND:ONE STORY WHSE/MFG 50-100000 S.
3331	IND:MUL STORY WHSE/MFG 50-100000 S.
3340	IND:ONE STORY WHSE MFG 100000+ S.F.
3341	IND:MUL STORY WHSE MFG 100000+ S.F.

LU Code	Description
3345	IND: OLD MILL TYPE UP TO 50000 S.F.
3346	IND:OLD MILL TYPE 50000-100000 S.F.
3347	IND:OLD MILL TYPE ABOVE 100000 S.F.
3348	INDUST CMPLX CONVERT TO MULTITENANT
3351	IND: COLD STORAGE PLANT
3352	IND:MEAT PACKING PLANT
3500	IND:INDUSTRIAL BLDG CONDO
3501	COMMON ELEMENT-INDUST. BLDG CONDO
3503	CONVERT REAL EST-INDUST BLDG CONDO
4000	MISC./VARIED COMMERCIAL
4001	BLDG ONLY/LAND ASSESSED SEPARATELY-
4002	LAND ONLY/BLDG ASSESSED SEPARATELY-
4100	RETAIL, OFFICE, APTS. - MULTI-USE
4200	LOW-RISE 5-10 UNITS(1 BLDG) < 3-STR
4201	LOW-RISE 11-30 UNITS(1 BLD) < 3 STR
4202	LOW-RISE > 30 UNITS, < 3-STORY
4203	GARDEN (GROUP OF LOW RISE) < 50 UNI
4204	GARDEN(GROUP OF LOW RISE) > 51 UNIT
4205	GARDEN(GROUP OF LOW RISE) > 101 UNI
4210	HIGH RISE > 4-STORY, < 50 UNITS W/E
4211	HIGH RISE > 4-STORY, > 50 UNITS W/E
4212	HIGH RISE > 4-STORY, > 100 UNIT W/E
4213	TOWNHOUSES UP TO 25
4214	TOWNHOUSES 26 OR MORE
4216	SUBSIDIZED HOUSING
4220	HOT/MOT UNDER 40 UNITS W/RESTAURANT
4221	HOT/MOT 40-100 UNITS W/RESTAURANT
4222	HOT/MOT 101+ UNITS W/RESTAURANT
4223	HOT/MOT UNDER 40 UNITS W/O RESTAURA
4224	HOT/MOT 40-100 UNITS W/O RESTAURANT
4225	HOT/MOT 101+ UNITS W/OUT RESTAURANT
4226	HOT/MOT CABINS-SMALL MOTEL (MOM&POP
4227	HOT/MOT BED & BREAKFAST
4230	DEPARTMENT STORE
4231	1-STORY STRIP STORE (NO MAJOR FOOD)
4232	2-STORY STRIP STORE W/OFF OR APT
4235	AIRPORT
4236	AUTOMOBILE GRAVEYARD
4237	AUTOMOBILE SHOWROOM
4238	AUTO SERVICE CENTER - PEP BOYS, ETC
4239	BEVERAGE DISTRIBUTOR
4240	BANK
4241	BAR OR TAPROOM
4242	BOWLING ALLEY
4244	BAR/HOTEL
4245	CAR WASH
4246	COIN-OPERATED LAUNDROMAT
4248	CONVIENCE STORE (7-11,WAWA)
4249	CONTRACTOR'S FACILITIES
4250	DAIRY STORE
4251	DAY CAMP
4252	DINER
4253	DISC. STORES(K-MART, JAMESWAY, ETC.
4254	FARMER'S MARKET
4255	FAST FOOD OPER. (MCDONALDS, HARDEE
4256	FUNERAL HOME
4257	DAY CARE CENTER
4259	GAS STATION, MINI MARKET
4260	GAS STATION
4261	GOLF COURSES
4262	GREENHOUSES, NURSERIES
4263	HEALTH SPA
4264	HOME CENTER (CHANEL, ETC.)
4265	LANDFILL
4266	LUMBER YARDS
4267	MINI BANK
4271	MEDICAL-DENTAL CENTER
4272	MULTI-TENANT MINI STORAGE FACILITY
4275	PARKING LOTS
4276	PARKS, REC. FAC., POOLS (PRIVATE)
4277	POST OFFICE
4278	PARKING GARAGE
4279	QUARRY
4280	REPAIR SHOP OR GARAGES
4281	RESTAURANT W/LIQUOR LICENSE
4282	RESTAURANT WITHOUT LIQUOR LICENSE
4283	RETAIL AND SHOP
4284	RETAIL SHOWROOM (FURNITURE, ETC)
4289	FUEL OIL DISTRIBUTION COMPANY
4290	SCRAP & JUNK YARDS
4291	SKATING RINKS
4292	STORAGE TANKS
4293	SUPERMARKETS
4294	USED CAR DEALER
4295	TENNIS AND/OR REQUETBALL CLUBS
4296	THEATER (INDOOR)

LU Code	Description
4297	THEATER (OUTDOOR)
4298	TRANSMISSION TOWERS (RADIO, TV)
4299	TRUCK TERMINAL
4300	ANIMAL HOSPITAL/DOG KENNEL
4304	TRASH TRANSFER STATION
4305	PRIVATE SEWER PLANT
4310	MOBILE HOME PARK: 1 TO 50 PADS
4311	MOBILE HOME PARK: 51 TO 100 PADS
4312	MOBILE HOME PARK 100+ PADS
4320	OFFICE: 1 STORY UNDER 15000 S.F.
4321	OFFICE: MUL STORY UNDER 15000 S.F.
4325	OFFICE: 1 STORY 15000-50000 S.F.
4326	OFFICE: MUL STORY 15000-50000 S.F.
4330	OFFICE: 1 STORY 50000-100000 S.F.
4331	OFFICE: MUL STORY 50000-100000 S.F.
4335	OFFICE: 1 STORY 100000+ S.F.
4336	OFFICE: MUL STORY 100000+ S.F.
4340	OFFICE: 1 STORY RESEARCH AND ENGINE
4341	OFFICE: MUL STORY RESEARCH & ENGINE
4343	PHARMACEUTICAL FACILITY
4345	COMMERCIAL CONDO
4346	COMMON ELEMENT - COMMERCIAL CONDO
4347	CONVERTIBLE REAL ESTATE - COMM COND
4500	OFFICE: CONDO
4501	OFFICE: CONDO COMMON ELEMENT
4502	OFFICE: FLEX BUILDINGS
4503	OFFICE: CONVERT R.E., BLDG CONDO
4545	MALL STORES
4546	SHOPPING CENTER - NBHD(MAJOR FOOD)
4547	SHOPPING CENTER - COMMUNITY(FOOD +)
4548	SHOPPING CENTER - REGIONAL (2 DEPT
4550	EXHIBITION AND CONVENTION CENTER
4800	LERTA
5000	TAXABLE MISCELLANOUS
5101	TAXABLE CHURCH
5102	TAXABLE CHURCH PARKING LOT
5104	TAXABLE CONVENTS, RETREAT HOUSES
5105	TAXABLE PARSONAGES
5106	TAXABLE OTHER RELIGIOUS ORGANIZATIO
5110	AXABLE OTHER CHARITABLE ORGANIZATIO
5120	TAXABLE CEMETERIES (RELIGIOUS)
5125	TAXABLE CEMETERIES (PRIVATE)
5129	TAXABLE FIREHOUSES

LU Code	Description
5130	AXABLE HOSPITALS, MEDICAL FACILITIE
5131	TAXABLE AMBULANCE FACILITY
5140	TAXABLE NURSING HOMES, SANITORIUMS
5145	TAXABLE RETIREMENT CENTERS & HOMES
5150	TAXABLE SCHOOLS - PAROCHIAL,NURSERY
5152	TAXABLE SCHOOLS-PAROCHIAL,PRIMARY
5154	TAXABLE SCHOOLS-PAROCHIAL,SECONDARY
5156	TAXABLE SCHOOLS-PAROCHIAL,HIGH
5158	TAXBL SCHOOLS-PAROCHIAL COLLEGE,UNI
5166	TAXABLE SCHOOLS-PRIVATE NURSERY
5168	TAXABLE SCHOOLS-PRIVATE PRIMARY
5170	TAXABLE SCHOOLS-PRIVATE SECONDARY
5172	TAXABLE SCHOOLS-PRIVATE HIGH SCH.
5174	TAXBL SCHOOLS-PVT COLLEGE UNIVER.
5178	TAXABLE SCHOOLS-SPECIAL PURPOSE
5180	TAXBL CLUBS & FRATL ORGANIZATIONS
5319	EXEMPT 319
5515	EXEMPT 515
5800	PARTIAL EXEMPT MISCELLANOUS
5801	PARTIAL EXEMPT CHURCH
5804	PART EXEMPT CONVENTS, RETREAT HOUSE
5805	PARTIAL EXEMPT PARSONAGES
5806	PARTL EXEMPT OTHER RELIGIOUS ORG
5810	PARTIAL EXEMPT OTHER CHARITABLE ORG
5820	PARTL EXEMPT CEMETERIES (RELIGIOUS)
5825	PARTIAL EXEMPT CEMETERIES (PRIVATE)
5829	PARTIAL EXEMPT FIREHOUSES
5830	PARTL EXEMPT HOSPITALS, MED FACIL.
5831	PARTIAL EXEMPT AMBULANCE FACILITY
5840	PARTL EXEMPT NURS HOMES, SANITORIUS
5845	PARTL EXEMPT RETIREMENT CTRS & HOME
5850	PARTL EXEMPT SCHLS-PAROCHIAL,NURSER
5852	PARTL EXEMPT SCHLS-PAROCHIAL,PRIMAR
5854	PARTL EXEMPT SCHLS-PAROCHIAL,SECOND
5856	PARTL EXEMPT SCHLS-PAROCHIAL,HIGH S
5858	PARTL EXEMPT SCHLS-PAROCHIAL COLLEG
5866	PARTL EXEMPT SCHOOLS-PRIVATE NURSER
5868	PARTL EXEMPT SCHOOLS-PRIVATE PRIMAR
5870	PARTL EXEMPT SCHLS-PRIVATE SECONDAR
5872	PARTL EXEMPT SCHLS-PRIVATE HIGH SCH
5874	PARTL EXEMPT SCHLS-PRIV. COLL. UNIV
5876	PARTL EXEMPT SCHLS-PRIVATE VOCATION
5878	PARTL EXEMPT SCHOOLS-SPECIAL PURPOS

LU Code	Description
5880	PARTL EXEMPT CLUBS, FRATERNAL ORG
5900	EXEMPT MISCELLANOUS
5901	EXEMPT CHURCH
5902	EXEMPT CHURCH PARKING LOT
5903	PARTL EXMPT CHRCH PKG LT
5904	EXEMPT CONVENTS, RETREAT HOUSES
5905	EXEMPT PARSONAGES
5906	EXEMPT OTHER RELIGIOUS ORGANIZATION
5910	EXEMPT OTHER CHARITABLE ORGANIZATIO
5920	EXEMPT CEMTERIES (RELIGIOUS)
5925	EXEMPT CEMETERIES (PRIVATE)
5929	EXEMPT FIREHOUSES
5930	EXEMPT HOSPITALS, MEDICAL FACILITIE
5931	EXEMPT AMBULANCE FACILITY
5940	EXEMPT NURSING HOMES, SANITORIUMS
5945	EXEMPT RETIREMENT CENTERS & HOMES
5950	EXEMPT SCHOOLS-PAROCHIAL, NURSERY
5952	EXEMPT SCHOOLS-PAROCHIAL,PRIMARY
5954	EXEMPT SCHOOLS-PROCHIAL,SECONDARY
5956	EXEMPT SCHOOLS-PAROCHIAL,HIGH SCHOO
5958	EXEMPT SCHLS-PAROCHIAL COLLEGE, UNI
5966	EXEMPT SCHOOLS-PRIVATE NURSERY
5968	EXEMPT SCHOOLS-PRIMARY
5970	EXEMPT SCHOOLS-PRIVATE SECONDARY
5972	EXEMPT SCHOOLS-PRIVATE HIGH SCHOOL
5974	EXEMPT SCHOOLS-PRIVATE COLLEGE-UNIV
5976	EXEMPT SCHOOLS-PRIVATE VOCATIONAL
5978	EXEMPT SCHOOLS-SPECIAL PURPOSE
5980	EXEMPT CLUBS & FRATL ORGANIZATIONS
8100	PUBLIC UTILITY-ASSESSED TOTAL
8200	GOVERNMENT-ASSESSED TOTAL
8880	GOVERNMENT-ASSESSED PARTIAL
8890	PUBLIC UTILITY-ASSESSED PARTIAL
8900	PUBLIC UTILITY-EXEMPT
8910	GOVERNMENT-EXEMPT
8966	PUBLIC UTIL-STATE TAXBL,LOCAL EXEMP
8980	GOVERNMENT-ASSESSED STATE TAXABLE
9910	EXEMPT- FEDERAL GOVERNMENT
9920	EXEMPT - STATE GOVERNMENT
9930	EXEMPT - COUNTY GOVERNMENT
9940	EXEMPT - LOCAL MUNICIPALITY
9950	EXEMPT - BD OF ED, PRIMARY
9960	EXEMPT - BD OF ED, SECONDARY
9970	EXEMPT - BD OF ED, HIGH SCHOOL
9980	EXEMPT - BD OF ED, UNIVERSITY
9990	EXEMPT - BD OF ED, VOCATIONAL

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 2

EXHIBIT 2

Gannett Fleming

Waste Authority of Eastern Montgomery County

2006 Waste Generation Study Field Surveys
Listed by Land Use Code

Land Use Code	Land Use Code Definition		Commercial Properties In Authority's Assessment Records	Minimum Percentage	Target (Max=50)	Completed Surveys In 2004	2006 New Surveys Completed	Total Surveys Completed
0319	Preferential Assessment	37 Miscellaneous	3	50%	2	0	1	1
0515	Preferential Assessment	20 Golf Course	24	35%	8	12	1	13
1001	House Only, No Land	SF Single Family - 1 SFU	0	0%	0	0	0	0
1003	Open Space/Common Area	50 Multi-Family	0	0%	0	0	0	0
1004	Common Area - Amenities	50 Multi-Family	0	0%	0	0	0	0
1101	Single Family	SF Single Family - 1 SFU	0	0%	0	0	0	0
1105	Single Dwelling Garage Apt	SF Single Family - 1 SFU	0	0%	0	0	0	0
1108	More Than I House. Detached	SF Single Family - 1 SFU	0	0%	0	0	0	0
1116	House With In-Law Suite	SF Single Family - 1 SFU	0	0%	0	0	0	0
1132	Duplex	50 Multi-Family	954	20%	50	75	243	318
1134	Triplex	50 Multi-Family	197	20%	39	35	72	107
1136	Quadaplex	50 Multi-Family	74	25%	19	16	47	63
1140	Residential Conversion 5 Or More Ap	50 Multi-Family	173	20%	35	9	36	45
1145	Rooming House- - Tourist Home	50 Multi-Family	35	35%	12	10	16	26
1160	Residential-Commercial	SF Single Family - 1 SFU	0	0%	0	0	0	0
1161	Residential-Professional	SF Single Family - 1 SFU	0	0%	0	0	0	0
1175	Condominium:Single- Detached	50 Multi-Family	9	50%	5	1	1	2
1188	Condo Townhouse	50 Multi-Family	39	35%	14	1	4	5
1189	Condominium Cluster 2-5 Units	50 Multi-Family	2	50%	1	0	2	2
1190	Condominium - 2-4 Units	50 Multi-Family	7	50%	4	1	1	2
1201	Condo Carden Smf--Private Ent. 1.3	50 Multi-Family	17	35%	6	1	1	2
1202	Condo Garden Style-Common Ent. I.3S	50 Multi-Family	25	35%	9	2	8	10
1203	Condommum Mid Rise 4-4 Stories	51 Multi-Family High Rise	21	35%	7	4	9	13
1204	Condominium High Rise 7 + Stories	51 Multi-Family High Rise	41	35%	14	17	1	18
1222	Manufactured Home - Rented Lot	50 Multi-Family	136	20%	27	0	0	0
1270	Seasonal Dwelling	SF Single Family - 1 SFU	0	0%	0	0	0	0
1901	Exempt Dwelling Verterans	SF Single Family - 1 SFU	0	0%	0	0	0	0
3000	Ind:One Story Misc./Varied	42 Manufacturing\Warehousing	7	50%	4	5	0	5
3320	Ind:One Story Whsf/Mfg Up To 15000	42 Manufacturing\Warehousing	301	20%	50	61	7	68
3321	Ind:Mul Story Whsf/Mfg Up To 15Ooo	42 Manufacturing\Warehousing	121	20%	24	28	3	31
3324	Ind:Mul Story Whsf/Mfg 15-25000 S.F.	42 Manufacturing\Warehousing	37	35%	13	16	0	16
3325	Ind:One Story Whsf/Mfg 15-25000 S.F.	42 Manufacturing\Warehousing	80	25%	20	19	11	30

Waste Authority of Eastern Montgomery County

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3326	Ind:Mul Story Whsf/Mfg 25-50000 S.F.	42	Manufacturing\Warehousing	48	35%	17	14	9	23
3327	Ind:One Story Whsf/Mfg 25-50000 S.F.	42	Manufacturing\Warehousing	92	25%	23	22	11	33
3330	Ind:One Story Whsf/Mfg 50-100000 S.F.	42	Manufacturing\Warehousing	59	25%	15	9	19	28
3331	Ind:Mul Story Whsf/Mfg 50-100000 S.F.	42	Manufacturing\Warehousing	27	35%	9	11	1	12
3340	Ind:One Story Whsf/Mfg 100000+ S.F.	42	Manufacturing\Warehousing	24	35%	8	14	0	14
3341	Ind:Mul Story Whsf/Mfg 10Oooo+ S.F.	42	Manufacturing\Warehousing	27	35%	9	6	7	13
3345	Ind:Old Mill Type Up To 50001 S.F.	42	Manufacturing\Warehousing	5	50%	3	2	1	3
3346	Ind:Old Mill Type 50000-100000 S.F.	42	Manufacturing\Warehousing	3	50%	2	1	0	1
3347	Ind:Old Mill Type Above 100000 S.F.	42	Manufacturing\Warehousing	3	50%	2	2	0	2
3348	Indust Cmpix Convert To Multitenant	42	Manufacturing\Warehousing	11	35%	4	5	0	5
3351	Ind: Cold Storage Plant	42	Manufacturing\Warehousing	0	0%	0	0	0	0
3352	Ind:Meat Packing Plant	42	Manufacturing\Warehousing	4	50%	2	2	2	4
3500	Ind:Industrial Bldg Condo	42	Manufacturing\Warehousing	96	25%	24	65	3	68
3501	Common Element-Indust- Bldg Condo	42	Manufacturing\Warehousing	0	0%	0	0	0	0
3503	Convert Real Est-Indust Bldg Condo	42	Manufacturing\Warehousing	1	100%	1	0	0	0
4000	Misc/Varied Commercial	38	Other Retail, Small Stores and Multi-Use	53	25%	13	2	22	24
4001	Bldg Only Land Assessed Separately-	7	Office Building (including Gov't)	6	50%	3	1	0	1
4100	Retail- Office. Apts. - Multi-Use	38	Other Retail, Small Stores and Multi-Use	2,391	20%	50	31	128	159
4200	Low-Rise 5-10 Units(1 Bldg) < 3Str	51	Multi-Family High Rise	67	25%	17	4	18	22
4201	Low-Rise 11-30 Unrrs(I Bldg) < 3 Str	51	Multi-Family High Rise	95	25%	24	1	42	43
4202	Low-Risi: > 30 Units. < 3-Story	51	Multi-Family High Rise	30	35%	11	4	7	11
4203	Garden (Group Of Low Rise) < 50 Unit	51	Multi-Family High Rise	30	35%	11	6	6	12
4204	Garden(Group Of Low Rise) > 51 Unit	51	Multi-Family High Rise	20	35%	7	3	8	11
4205	Garden(Group Of Low Rise) > 101 Unit	51	Multi-Family High Rise	40	35%	14	5	13	18
4210	High Rise > 4-Story. < 50 Units W/E	51	Multi-Family High Rise	5	50%	3	4	0	4
4211	High Rise > 4-Story, > 50 Units W/E	51	Multi-Family High Rise	12	35%	4	6	2	8
4212	High Rise > 4-Story, > 100 Unit W/E	51	Multi-Family High Rise	26	35%	9	6	7	13
4213	Townhous Up Up To 25	50	Multi-Family	24	35%	8	0	12	12
4214	Townhouses 26 Or More	50	Multi-Family	6	50%	3	1	2	3
4216	Subsidized Housrng	50	Multi-Family	8	50%	4	3	2	5
4220	Hot/Mot Under 40 Units W/Restaurant	2	Restaurant\Small Hotel without Liquor License	1	100%	1	0	1	1
4221	Hot/Mot 40-1 00 Units W/Restaurant	5	Hotel\Motel and Restaurant	3	50%	2	2	0	2

Waste Authority of Eastern Montgomery County

2006 Waste Generation Study Field Surveys
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4222	Hot/Mot Lol+ Units W/Restaurant	5	Hotel\Motel and Restaurant	9	50%	5	6	1	7
4223	Hot/Mot Under 40 Units W/O Restaurant	6	Hotel without Restaurant	1	100%	1	2	0	2
4224	Hot/Mot 40- 1 00 Units W/O Restaurant	6	Hotel without Restaurant	0	0%	0	0	0	0
4225	Hot/Mot 101- Units W/Out Restaurant	6	Hotel without Restaurant	20	35%	7	1	11	12
4226	Hot/Mot Cabins-Small Motel (Mom&.Pop)	6	Hotel without Restaurant	0	0%	0	0	0	0
4227	Hot/Mot Bed & Breakfast	6	Hotel without Restaurant	0	0%	0	0	0	0
4230	Department Store	24	Large\Department Stores	14	35%	5	0	3	3
4231	1-Story Strip Store (No Major Food)	38	Other Retail, Small Stores and Multi-Use	91	25%	23	10	19	29
4232	2-Story Strip Store W/Off Or Apt	25	Shopping Centers\Strip Stores	47	35%	16	10	7	17
4236	Automobile Graveyard	43	Warehouse	3	50%	2	0	3	3
4237	Autoomobile Showroom	39	Auto Dealers without Repair Centers	64	25%	16	5	10	15
4238	Auto Service Center - Pep Boys. Etc	40	Auto Service Centers\Car Wash	14	35%	5	1	7	8
4239	Beverage Distributor	43	Warehouse	10	50%	5	1	4	5
4240	Bank	30	Banks	104	20%	21	29	2	31
4241	Bar Or Taproom	4	Bar \ Hotel Bar	78	25%	20	12	21	33
4242	Bowliing Alley	22	Skating Rinks\Bowling Alleys\Theaters	2	50%	1	0	2	2
4244	Bar/Hotel	4	Bar \ Hotel Bar	5	50%	3	1	1	2
4245	Car Wash	40	Auto Service Centers\Car Wash	20	35%	7	7	3	10
4246	Coin Operated Laundromat	38	Other Retail, Small Stores and Multi-Use	4	50%	2	3	0	3
4248	Convenience Store (7-11,Wawa)	27	Convenience and Mini Market	42	35%	15	16	4	20
4249	Contractor'S Facilities	36	Contractor Facilities	31	35%	11	1	15	16
4250	Dairy Store	28	Drug \ Dairy Stores	1	100%	1	1	0	1
4251	Day Camp	21	Parks\Recreation\Swimming Areas	6	50%	3	1	2	3
4252	Diner	3	Fast Food\Diner Restaurant	5	50%	3	1	2	3
4253	Disc. Stores(K-Mart, Jamesway, Etc)	24	Large\Department Stores	24	35%	8	5	4	9
4255	Fast Food Oper. (Mcdonalds, Hardees)	3	Fast Food\Diner Restaurant	56	25%	14	0	19	19
4256	Funeral Home	16	Hospitals\Medical Facilities	43	35%	15	12	12	24
4257	Day Care Center	8	Nursery and Preschool	29	35%	10	8	5	13
4259	Gas Station, Mini Market	27	Convenience and Mini Market	36	35%	13	15	2	17
4260	Gas Staiton	32	Gas Stations (only)	129	20%	26	2	38	40
4261	Golf Courses	20	Golf Course	6	50%	3	5	0	5
4262	Greenhouses, Nurseries	35	Nurseries	20	35%	7	0	11	11

Waste Authority of Eastern Montgomery County

2006 Waste Generation Study Field Surveys
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Land Use Code	Land Use Code Definition		Commercial Properties In Authority's Assessment Records	Minimum Percentage	Target (Max=50)	Completed Surveys In 2004	2006 New Surveys Completed	Total Surveys Completed
4263	Healthspa	19 Health and Other Fitness Related Centers	9	50%	5	0	4	4
4264	Homecenter (Channel Etc.)	29 Home\Lumber Centers	6	50%	3	2	3	5
4266	Lumber Yards	38 Other Retail, Small Stores and Multi-Use	8	50%	4	3	3	6
4271	Medical-Dental Center	34 Medical, Dental\Veterinary Centers	62	25%	16	16	6	22
4272	Multi.Tenant Mini Storage Facility	43 Warehouse	37	35%	13	3	9	12
4275	Parking Lots	33 Parking Lots and Garages	2	50%	1	1	0	1
4276	Parks. Rec. Fac. Pools (Private)	21 Parks\Recreation\Swimming Areas	15	35%	5	0	4	4
4277	Post Office	31 Commercial Post Offices	4	50%	2	4	1	5
4278	Parking Garage	33 Parking Lots and Garages	1	100%	1	0	1	1
4279	Quarry	37 Miscellaneous	9	50%	5	5	0	5
4280	Repair Shop Or Garages	40 Auto Service Centers\Car Wash	362	20%	50	61	14	75
4281	Restaurant W/Liquor License	1 Restaurant with Liquor License	89	25%	22	19	19	38
4282	Restaurant Withhout Liquor License	2 Restaurant\Small Hotel without Liquor License	34	35%	12	4	15	19
4283	Retail And Shop	38 Other Retail, Small Stores and Multi-Use	39	35%	14	8	12	20
4284	Retail Showroom (Furniture Etc.)	38 Other Retail, Small Stores and Multi-Use	7	50%	4	5	0	5
4289	Fuel Oil Distribution Company	41 Truck Terminals\Fuel Distribution	7	50%	4	1	3	4
4290	Scrap & Junk Yards	43 Warehouse	8	50%	4	0	3	3
4291	Skating Rinng	22 Skating Rinks\Bowling Alleys\Theaters	3	50%	2	0	2	2
4292	Storage Tanks	37 Miscellaneous	4	50%	2	2	0	2
4293	Super Markets	45 Supermarkets\Major Food Shopping Centers	16	35%	6	1	5	6
4294	Used Car Dealer	39 Auto Dealers without Repair Centers	14	35%	5	3	5	8
4295	Tennis And/Or Requetball Clubs	19 Health and Other Fitness Related Centers	11	35%	4	4	0	4
4296	Theater(Indoor)	22 Skating Rinks\Bowling Alleys\Theaters	8	50%	4	1	2	3
4298	Transmission Towers (Radio, Tv)	37 Miscellaneous	5	50%	3	0	4	4
4299	Truck Terminal	41 Truck Terminals\Fuel Distribution	6	50%	3	1	3	4
4300	Animal Hospital/Dog Kennel	34 Medical, Dental\Veterinary Centers	26	35%	9	1	10	11
4310	Mobile Home Park- 1 To 50 Pads	50 Multi-Family	0	0%	0	0	0	0
4311	Mobile Home Park. 51 To 100 Pads	50 Multi-Family	0	0%	0	1	0	1
4312	Mobile Home Park 100+ Pads	50 Multi-Family	0	0%	0	0	0	0
4320	Office 1 Story Under 15000 S.F.	7 Office Building (including Gov't)	61	25%	15	9	13	22
4321	Office Mul Story Under 15000 S.F.	7 Office Building (including Gov't)	141	20%	28	32	3	35
4325	Office:- 1 Story 15000-50000 S.F.	7 Office Building (including Gov't)	69	25%	17	0	17	17

Waste Authority of Eastern Montgomery County

2006 Waste Generation Study Field Surveys
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4326	Office- Mul Story 15000-50000 S.F.	7	Office Building (including Gov't)	162	20%	32	44	5	49
4330	Office: 1 Story 50000-100000 S.F.	7	Office Building (including Gov't)	21	35%	7	9	2	11
4331	Office- Mul Story 50000-10Oooo S.F.	7	Office Building (including Gov't)	96	25%	24	17	20	37
4335	Office:- 1 Story 100000+ S.F.	7	Office Building (including Gov't)	3	50%	2	3	0	3
4336	Office. Mul Story 100000+ S.F.	7	Office Building (including Gov't)	73	25%	18	21	4	25
4340	Office- 1 Story Research And Engine	7	Office Building (including Gov't)	4	50%	2	0	4	4
4341	Office: Mul Story Research & Engine	7	Office Building (including Gov't)	5	50%	3	4	0	4
4343	Pharmaceutical Facility	42	Manufacturing\Warehousing	7	50%	4	8	0	8
4345	Commercial Condo	38	Other Retail, Small Stores and Multi-Use	234	20%	47	89	5	94
4500	Office- Condo	7	Office Building (including Gov't)	388	20%	50	104	0	104
4501	Office- Condo Common Element	7	Office Building (including Gov't)	1	100%	1	1	0	1
4502	Office- Flex Buildings	7	Office Building (including Gov't)	18	35%	6	6	0	6
4503	Office: Convert R.E., Bldg Condo	7	Office Building (including Gov't)	0	0%	0	0	0	0
4545	Mall Stores	26	Malls	8	50%	4	1	3	4
4546	Shopping Center - Nbhd(Major Food)	45	Supermarkets\Major Food Shopping Centers	32	35%	11	6	15	21
4547	Shopping Center - Community+(Food)	45	Supermarkets\Major Food Shopping Centers	11	35%	4	0	5	5
4548	Shopping Center - Regional (2 Dept	25	Shopping Centers\Strip Stores	4	50%	2	1	0	1
4550	Exhibition And Convention Center	23	Exhibition and Convention Centers	1	100%	1	0	0	0
4800	Lerta	37	Miscellaneous	9	50%	5	1	3	4
5000	Taxable: Miscellaneous	18	Other Institutions	6	50%	3	0	2	2
5101	Taxable Church	11	Places of Worship	8	50%	4	1	2	3
5104	Taxable Convents,Retreat Houses	12	Religious Community	0	0%	0	0	0	0
5105	Taxable Parsonages	12	Religious Community	0	0%	0	0	0	0
5106	Taxable Other Religious Organizations	13	Charities and Religious Organizations	2	50%	1	1	0	1
5110	Taxable Other Charitable Organizations	13	Charities and Religious Organizations	2	50%	1	0	1	1
5120	Taxable Cemeteries (Religious)	14	Cemeteries	1	100%	1	0	1	1
5125	Taxable Cemeteries (Private)	14	Cemeteries	8	50%	4	0	4	4
5129	Taxable Firehouses	17	Fire and Ambulance Halls	2	50%	1	0	2	2
5130	Taxable Hospitals, Medical Facilities	16	Hospitals\Medical Facilities	15	35%	5	1	8	9
5131	Taxable Ambulance Facility	17	Fire and Ambulance Halls	0	0%	0	0	0	0
5140	Taxable Nursing, Homes. Sanitoriums	15	Retirement\Nursing Homes	29	35%	10	12	9	21
5145	Taxable Retirement Center & Homes	15	Retirement\Nursing Homes	15	35%	5	0	7	7

Waste Authority of Eastern Montgomery County

2006 Waste Generation Study Field Surveys
Listed by Land Use Code

Land Use Code	Land Use Code Definition		Commercial Properties In Authority's Assessment Records	Minimum Percentage	Target (Max=50)	Completed Surveys In 2004	2006 New Surveys Completed	Total Surveys Completed
5150	Taxable Schools - Parochial, Nursery	8 Nursery and Preschool	2	50%	1	0	1	1
5152	Taxable Schools - Parochial, Primary	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5154	Taxable Schools-Parochial, Secondary	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5156	Taxable Schools-Parochial, High	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5158	Taxable Schools-Parochial, College Univer.	10 University and College	0	0%	0	0	0	0
5166	Taxable Schools-Private Nursery	8 Nursery and Preschool	0	0%	0	0	0	0
5170	Taxable Schools-Private Secondary	9 Schools-Primary, Secondary, Special Purpose	2	50%	1	0	2	2
5172	Taxable Schools-Private High Sch	9 Schools-Primary, Secondary, Special Purpose	1	100%	1	1	0	1
5174	Taxable Schools-Pvt College Univer.	10 University and College	11	35%	4	5	5	10
5178	Taxable Schools-Special Purpose	9 Schools-Primary, Secondary, Special Purpose	8	50%	4	4	0	4
5180	Taxable Clubs & Fratl Organizations	18 Other Institutions	26	35%	9	0	16	16
5800	Partial Exempt Miscellaneous	18 Other Institutions	0	0%	0	0	0	0
5801	Partial Exempt Church	11 Places of Worship	0	0%	0	0	0	0
5804	Partial Exempt Convents, Retreat House	12 Religious Community	0	0%	0	0	0	0
5805	Partial Exempt Parsonages	12 Religious Community	0	0%	0	0	0	0
5806	Partial Exempt Other Religious Organizations	13 Charities and Religious Organizations	0	0%	0	0	0	0
5810	Partial Exempt Other Charitable Organizations	13 Charities and Religious Organizations	2	50%	1	0	0	0
5820	Partial Exempt Cemeteries (Religious)	14 Cemeteries	0	0%	0	0	0	0
5825	Partial Exempt Cemeteries (Private)	14 Cemeteries	0	0%	0	0	0	0
5829	Partial Exempt Firf-Houses	17 Fire and Ambulance Halls	0	0%	0	0	0	0
5830	Partial Exempt Hospitals, Med Facility	16 Hospitals\Medical Facilities	0	0%	0	0	0	0
5831	Partial Exempt Ambulance Facility	17 Fire and Ambulance Halls	0	0%	0	0	0	0
5840	Partial Exempt Nurs Homes, Sanitariums	15 Retirement\Nursing Homes	0	0%	0	0	0	0
5845	Partial Exempt Retirement Ctrs & Home	15 Retirement\Nursing Homes	0	0%	0	0	0	0
5850	Partial Exempt Schls-Parochial Nursery	8 Nursery and Preschool	0	0%	0	0	0	0
5852	Partial Exempt Schls-Parochial Primary	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5854	Partial Exempt Schls-Parochial Second	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5856	Partial Exempt Schls-Parochial High Sch	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5858	Partial Exempt Schls-Parochial Colleg	10 University and College	0	0%	0	0	0	0
5866	Partial Exempt Schools-Private Nursery	8 Nursery and Preschool	0	0%	0	0	0	0
5868	Partial Exempt Schools-Private Primary	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5870	Partial Exempt Schls-Private Secondary	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0

Waste Authority of Eastern Montgomery County

2006 Waste Generation Study Field Surveys
Listed by Land Use Code

Land Use Code	Land Use Code Definition		Commercial Properties In Authority's Assessment Records	Minimum Percentage	Target (Max=50)	Completed Surveys In 2004	2006 New Surveys Completed	Total Surveys Completed
5872	Partial Exempt Schls-Private High Sch	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5874	Partial Exempt Schls-Prlv. Coll. Univ	10 University and College	2	50%	1	0	2	2
5876	Partial Exempt Schls-Ppivate Vocation	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5878	Partial Exempt Schools-Specail Purpose	9 Schools-Primary, Secondary, Special Purpose	0	0%	0	0	0	0
5880	Partial Exempt Clubs. Fraternal Organizations	18 Other Institutions	0	0%	0	0	0	0
5900	Exempt Miscellanous	18 Other Institutions	52	25%	13	19	1	20
5901	Exempt Church	11 Places of Worship	306	20%	50	54	16	70
5902	Exempt Church Parking Lot	33 Parking Lots and Garages	1	100%	1	0	0	0
5904	Exempt Convents, Retreat Houses	12 Religious Community	21	35%	7	0	8	8
5905	Exempt Parsonages	12 Religious Community	52	25%	13	4	17	21
5906	Exempt Other Religious Organization	13 Charities and Religious Organizations	19	35%	7	4	4	8
5910	Exempt Other Charitable Organizations	13 Charities and Religious Organizations	36	35%	13	9	13	22
5920	Exempt Cemeteries (Religious)	14 Cemeteries	10	50%	5	0	7	7
5925	Exempt Cemeteries (Private)	14 Cemeteries	5	50%	3	2	1	3
5929	Exempt Firehouses	17 Fire and Ambulance Halls	51	25%	13	2	15	17
5930	Exempt Hospitals, Medical Facilities	16 Hospitals\Medical Facilities	34	35%	12	15	8	23
5931	Exempt Ambulance Facilities	17 Fire and Ambulance Halls	2	50%	1	0	0	0
5940	Exemft Nursing Homes. Sanitariiums	15 Retirement\Nursing Homes	8	50%	4	5	2	7
5945	Exempt Retirement Centers & Homes	15 Retirement\Nursing Homes	2	50%	1	0	1	1
5950	Exempt Schools-Parochial, Nursery	8 Nursery and Preschool	4	50%	2	3	1	4
5952	Exempt Schools-Parochial, Primary	9 Schools-Primary, Secondary, Special Purpose	18	35%	6	4	4	8
5954	Exempt Schools-Parochial, Secondary	9 Schools-Primary, Secondary, Special Purpose	4	50%	2	3	1	4
5956	Exempt Schools-Parochial, High School	9 Schools-Primary, Secondary, Special Purpose	7	50%	4	0	3	3
5958	Exempt Schools-Parochial College. Uni	10 University and College	17	35%	6	9	4	13
5966	Exempt Schools-Private Nursery	8 Nursery and Preschool	4	50%	2	1	1	2
5968	Exempt Schools-Primary	9 Schools-Primary, Secondary, Special Purpose	14	35%	5	7	1	8
5970	Exempt Schools-Private Secondary	9 Schools-Primary, Secondary, Special Purpose	13	35%	5	5	0	5
5972	Exempt Schools-Private- High School	9 Schools-Primary, Secondary, Special Purpose	4	50%	2	3	0	3
5974	Exempt Schools-Private College-Univ	10 University and College	16	35%	6	5	3	8
5976	Exempt Schools-Private Vocational	9 Schools-Primary, Secondary, Special Purpose	2	50%	1	2	0	2
5978	Exempt Schools-Special Purpose	9 Schools-Primary, Secondary, Special Purpose	18	35%	6	5	5	10
5980	Exempt Clubs & Fratl Organizations	18 Other Institutions	37	35%	13	19	2	21

Waste Authority of Eastern Montgomery County

2006 Waste Generation Study Field Surveys
Listed by Land Use Code

Land Use Code	Land Use Code Definition		Commercial Properties In Authority's Assessment Records	Minimum Percentage	Target (Max=50)	Completed Surveys In 2004	2006 New Surveys Completed	Total Surveys Completed
8100	Public Utility-Assessed Total	44 Utilities, Authorities	12	35%	4	2	4	6
8200	Crovernment-Assessed Total	44 Utilities, Authorities	0	0%	0	0	0	0
8880	Government-Assessed Partial	44 Utilities, Authorities	0	0%	0	0	0	0
8890	Public Utility-Assessed Partial	44 Utilities, Authorities	0	0%	0	0	0	0
8900	Public Utility Exempt	44 Utilities, Authorities	10	50%	5	0	4	4
8910	Government-Exempt	44 Utilities, Authorities	34	35%	12	6	12	18
8966	Public Utility-State Taxbl.Local Exempt	44 Utilities, Authorities	39	35%	14	0	20	20
8980	Government-Assessed State Taxable	44 Utilities, Authorities	0	0%	0	0	0	0
9910	Exempt- Federal Government	7 Office Building (including Gov't)	37	35%	13	15	0	15
9920	Exempt - State Government	7 Office Building (including Gov't)	17	35%	6	2	7	9
9930	Exempt - County Government	7 Office Building (including Gov't)	11	35%	4	2	4	6
9940	Exempt - Local.Municip.	7 Office Building (including Gov't)	144	20%	29	17	18	35
9950	Exempt - Bd Of Ed, Primary	9 Schools-Primary, Secondary, Special Purpose	48	35%	17	27	3	30
9960	Exempt - Bd - Ed Of Ed, Secondary	9 Schools-Primary, Secondary, Special Purpose	16	35%	6	7	0	7
9970	Exempt - Bd Of Ed, High School	9 Schools-Primary, Secondary, Special Purpose	8	50%	4	5	0	5
9980	Exempt - Bd Of Ed, University	9 Schools-Primary, Secondary, Special Purpose	4	50%	2	1	2	3
9990	Exempt - Bd Of Ed, Vocational	9 Schools-Primary, Secondary, Special Purpose	3	50%	2	1	0	1
	TOTALS		9,856		1,798	1,492	1,476	2,968

Comments : The number of properties listed for land use codes 1188, 1190,1201, 1202, 1203, and 1204 have been grouped into assumed complexes that include 60 units each.

The number of properties listed for land use codes 1132, 1134 and 1136 only include those properties in Norristown and the 301-A municipalities.

Sampling for land use codes 1003 and 1004 are done by sampling the townhomes and/or condominiums that comprise the complexes.

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 3

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Waste Authority of Eastern Montgomery County

Surveys Completed for the Current Study by Municipality

Municipality	Percentage of Assessed Commercial Property Sampled	Percent to Total Assessed Commercial Property	Percent to Total Properties Surveyed Completed In 2004 For Current Study	Percent to Total Properties Surveyed Completed In 2006 For Current Study
Abington	19%	7%	2%	8%
Ambler	28%	1%	0%	2%
Bryn Athyn	58%	0%	0%	0%
Cheltenham	43%	8%	6%	19%
Conshohocken	29%	2%	2%	2%
East Norriton	14%	4%	1%	3%
Hatboro	18%	3%	3%	0%
Horsham	9%	6%	2%	2%
Jenkintown	83%	4%	3%	19%
Lower Merion	12%	23%	15%	3%
Lower Moreland	30%	2%	2%	1%
Narberth	0%	0%	0%	0%
Norristown	38%	11%	6%	22%
Plymouth	16%	4%	3%	2%
Rockledge	59%	0%	0%	2%
Springfield	31%	2%	3%	1%
Upper Dublin	5%	4%	1%	0%
Upper Merion	77%	9%	40%	4%
Upper Moreland	25%	5%	5%	4%
West Conshohocken	37%	1%	1%	0%
Whitemarsh	61%	2%	4%	6%
Whitpain	23%	2%	2%	1%
Totals	29%	100%	100%	100%

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 4

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Waste Authority of Eastern Montgomery County

Annual Deliveries by Municipality

Municipality	Residential Assessed 1=Yes	2001 Residential	2001 Commercial	2002 Residential	2002 Commercial	2003 Residential	2003 Commercial	2004 Residential	2004 Commercial
Abington		24,841	14,199	23,434	16,016	24,150	15,872	24,593	19,613
Ambler		2,275	3,309	2,436	3,914	2,728	3,447	2,968	3,951
Bryn Athyn		487	1,038	483	855	517	957	506	1,232
Cheltenham		13,098	13,083	12,663	11,433	13,728	11,255	13,121	11,493
Conshohocken		3,742	6,631	3,653	6,838	3,800	6,605	3,910	10,731
East Norriton	1	5,377	5,906	6,019	5,713	6,347	5,883	7,428	5,612
Hatboro		3,423	4,732	3,347	4,729	3,459	4,676	3,294	5,317
Horsham	1	12,977	16,436	13,614	15,207	14,427	16,591	13,338	16,570
Jenkintown		1,674	5,674	1,573	3,592	1,545	3,705	1,573	3,183
Lower Merion		20,098	26,947	19,895	25,500	20,724	24,630	20,335	30,503
Lower Moreland		6,166	3,311	6,106	2,328	6,640	2,583	6,691	1,399
Narberth		2,315	241	2,385	77	2,558	40	2,501	79
Norristown	1	14,115	16,100	14,551	17,453	15,999	15,858	16,618	20,109
Plymouth		6,961	10,680	6,969	10,956	7,387	11,625	7,330	11,669
Rockledge		1,012	1,626	1,014	857	1,149	1,090	1,099	130
Springfield		8,910	12,369	8,839	11,728	9,458	12,895	8,945	10,126
Upper Dublin		10,715	5,548	10,605	4,691	10,746	5,359	9,672	6,249
Upper Merion	1	11,349	24,482	11,961	24,653	12,289	20,392	13,317	21,275
Upper Moreland		7,857	8,227	7,786	7,846	8,157	7,013	8,201	4,490
West Conshohocken		694	2,218	703	2,008	740	1,903	757	1,664
Whitemarsh		7,964	2,352	7,814	3,162	8,319	2,583	8,427	3,790
Whitpain	1	7,723	6,849	8,396	4,506	8,050	5,549	7,999	7,253
Total All Municipalities	5	173,776	191,957	174,246	184,063	182,916	180,510	182,622	196,438
Total Residential Assessed	5	51,542		54,541		57,112		58,700	
Total Municipal Residential Paid	17								
Total Municipal Commercial Paid	1								
Annual Totals			365,733		358,309		363,426		379,060

Waste Authority of Eastern Montgomery County

Annual Deliveries by Municipality

Municipality	Residential Assessed 1=Yes	2005 Residential	2005 Commercial	2006 Annualized Residential	2006 Annualized Commercial	Average Residential	Average Commercial
Abington		23,920	14,853	24,610	18,851	24,258	16,567
Ambler		2,684	6,595	2,684	6,992	2,629	4,701
Bryn Athyn		484	1,101	568	1,044	508	1,038
Cheltenham		12,242	12,613	11,332	11,669	12,697	11,924
Conshohocken		3,707	7,700	3,817	4,838	3,771	7,224
East Norriton	1	7,936	5,521	7,935	5,875	6,840	5,752
Hatboro		3,213	5,981	2,977	11,416	3,285	6,142
Horsham	1	12,838	20,530	13,182	20,755	13,396	17,681
Jenkintown		1,657	4,993	1,581	3,539	1,601	4,114
Lower Merion		20,064	31,530	20,957	30,985	20,346	28,349
Lower Moreland		6,593	2,131	6,909	2,524	6,517	2,379
Narberth		2,376	0	2,446	57	2,430	82
Norristown	1	15,755	26,256	16,127	25,313	15,527	20,181
Plymouth		7,001	12,105	7,396	12,657	7,174	11,615
Rockledge		1,035	157	1,029	343	1,056	701
Springfield		8,558	10,105	9,230	7,969	8,990	10,865
Upper Dublin		9,595	6,600	9,764	6,801	10,183	5,875
Upper Merion	1	13,388	22,069	9,494	20,368	11,966	22,207
Upper Moreland		7,969	6,328	7,860	4,733	7,972	6,440
West Conshohocken		732	2,541	748	2,661	729	2,166
Whitemarsh		7,806	3,683	8,122	3,592	8,075	3,194
Whitpain	1	7,701	7,115	8,816	7,088	8,114	6,393
Total All Municipalities	5	177,255	210,508	177,585	210,069	178,064	195,590
Total Residential Assessed	5	57,619		55,555		55,843	
Total Municipal Residential Paid	17					122,221	
Total Municipal Commercial Paid	1						82
			387,762		387,654		373,654

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 5

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Waste Authority of Eastern Montgomery County

Single Family Residential
Municipality Tonnage Summary

Municipality	Authority Assessed Residential Tonnage	Municipal Paid Tonnage	Total Residential Tonnage
Abington	0	24,258	24,258
Ambler	0	2,629	2,629
Bryn Athyn	0	508	508
Cheltenham	0	12,697	12,697
Conshohocken	0	3,771	3,771
East Norriton	6,566	0	6,566
Hatboro	0	3,285	3,285
Horsham	11,644	0	11,644
Jenkintown	0	1,601	1,601
Lower Merion	0	20,346	20,346
Lower Moreland	0	6,517	6,517
Narberth	0	2,430	2,430
Norristown	12,304	0	12,304
Plymouth	0	7,174	7,174
Rockledge	0	1,056	1,056
Springfield	0	8,990	8,990
Upper Dublin	0	10,183	10,183
Upper Merion	13,211	0	13,211
Upper Moreland	0	7,972	7,972
West Conshohocken	0	729	729
Whitemarsh	0	8,075	8,075
Whitpain	9,676	0	9,676
Totals	53,401	122,221	175,622

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 6

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Waste Authority of Eastern Montgomery County

Multi-family Residential
Municipality Tonnage Summary

Municipality	Authority Assessed Multi-Family Tonnage	Municipal Paid Multi-Family Tonnage	Total Multi-Family Tonnage
Abington	2,037	0	2,037
Ambler	330	0	330
Bryn Athyn	8	0	8
Cheltenham	3,197	0	3,197
Conshohocken	259	0	259
East Norriton	1,006	0	1,006
Hatboro	530	0	530
Horsham	1,804	0	1,804
Jenkintown	417	0	417
Lower Merion	3,782	0	3,782
Lower Moreland	111	0	111
Narberth	0	0	0
Norristown	3,736	0	3,736
Plymouth	1,068	0	1,068
Rockledge	28	0	28
Springfield	359	0	359
Upper Dublin	661	0	661
Upper Merion	2,719	0	2,719
Upper Moreland	1,982	0	1,982
West Conshohocken	25	0	25
Whitemarsh	481	0	481
Whitpain	750	0	750
Totals	25,290	0	25,290

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 7

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Waste Authority of Eastern Montgomery County

Non-residential
Municipality Tonnage Summary

Municipality	Authority Assessed Non-residential Tonnage	Municipal Paid Non-residential Tonnage	Total Non-residential Tonnage
Abington	15,537	0	15,537
Ambler	1,994	0	1,994
Bryn Athyn	416	0	416
Cheltenham	10,352	0	10,352
Conshohocken	3,210	0	3,210
East Norriton	5,777	0	5,777
Hatboro	2,389	0	2,389
Horsham	11,712	0	11,712
Jenkintown	1,679	0	1,679
Lower Merion	18,018	0	18,018
Lower Moreland	3,926	0	3,926
Narberth	0	82	82
Norristown	8,705	0	8,705
Plymouth	13,759	0	13,759
Rockledge	449	0	449
Springfield	5,057	0	5,057
Upper Dublin	9,030	0	9,030
Upper Merion	30,481	0	30,481
Upper Moreland	11,640	0	11,640
West Conshohocken	2,422	0	2,422
Whitemarsh	7,686	0	7,686
Whitpain	7,410	0	7,410
Totals	171,649	82	171,731

Waste System Authority of Eastern Montgomery County

Waste Generation Study - 2006 Update

EXHIBIT 8

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Waste Authority of Eastern Montgomery County

Single Family Residential, Multi-family Residential and Non-residential Municipality Tonnage Summary

Municipality	Residential Collection	Commercial Collection		Total Commercial Tonnage	Total Tonnage All Properties
	Total Residential Tonnage	Total Multi-Family Tonnage	Total Non-residential Tonnage		
Abington	24,258	2,037	15,537	17,574	41,832
Ambler	2,629	330	1,994	2,324	4,953
Bryn Athyn	508	8	416	424	932
Cheltenham	12,697	3,197	10,352	13,549	26,246
Conshohocken	3,771	259	3,210	3,469	7,240
East Norriton	6,566	1,006	5,777	6,783	13,349
Hatboro	3,285	530	2,389	2,919	6,204
Horsham	11,644	1,804	11,712	13,516	25,160
Jenkintown	1,601	417	1,679	2,096	3,697
Lower Merion	20,346	3,782	18,018	21,800	42,146
Lower Moreland	6,517	111	3,926	4,037	10,554
Narberth	2,430	0	82	82	2,512
Norristown	12,304	3,736	8,705	12,441	24,745
Plymouth	7,174	1,068	13,759	14,827	22,001
Rockledge	1,056	28	449	477	1,533
Springfield	8,990	359	5,057	5,416	14,406
Upper Dublin	10,183	661	9,030	9,691	19,874
Upper Merion	13,211	2,719	30,481	33,200	46,411
Upper Moreland	7,972	1,982	11,640	13,622	21,594
West Conshohocken	729	25	2,422	2,447	3,176
Whitemarsh	8,075	481	7,686	8,167	16,242
Whitpain	9,676	750	7,410	8,160	17,836
Totals	175,622	25,290	171,731	197,021	372,643

						Cost with $8.5 million budget
Residential	*Single Unit Residential*					
200	Residential	2				
210	One Family Year-Round Residence	68888				
210C	One Family Year-Round Residence	3153				
210W	One Family Year-Round Residence	269				
240	Rural Residence with Acreage	1989				
240W	Rural Residence with Acreage	3				
241	Primarily Residential, also used in agricultural production	249				
242	Recreational Use	76				
250	Estate	115				
250W	Estate	1				
260	Seasonal Residences	288				
260W	Seasonal Residences	44				
270	Mobile Home	793				
270W	Mobile Home	5				
417	Camps, Cottages, Bungalows	17				
417W	Camps, Cottages, Bungalows	2				
481	Downtown Row Type (with common wall)	210				
482	Downtown Row Type (detached)	333				
	Total	76437	Cost per Parcel	$ 45.30	$	55.80
	Total Units	**76437**	Total Units Cost	$ 3,462,596.10	$	4,265,184.60
	1.5 Unit Residential					
215	One Family Year-Round Residence with Accesory Apartment	271				
215W	One Family Year-Round Residence with Accesory Apartment	1				
220	Two Family Year-Round Residence	3901				
220W	Two Family Year-Round Residence	1				
	Total	4174	Cost per Parcel	$ 67.95	$	83.70
	Total Units	**6261**	Total Units Cost	$ 283,623.30	$	349,363.80
	2.0 Unit Residential					
230	Three Family Year-Round Residence	641				
281	Multiple Residences	151				
283	Residences with Incidental Commercial Use	56				
411	Apartments	835				

411C	Apartments	2594			
411P	Apartments	6			
411W	Apartments	1			
	Total	4284	Cost per Parcel	$ 90.60	$ 111.60
	Total Units	**8568**	Total Units Cost	$ 388,130.40	$ 478,094.40
	Total Residential Units	**91266**	Cost per Unit	$ 45.30	$ 55.80
	Total Revenue			$ 4,134,349.80	$ 5,092,642.80

			$6.9 Million Budget	$8.5 Million Budget	(6.9*1.25)
Commercial	*Class A*		Fee		
	410	Living Accomodations	3		
	418	Inns, Lodges, Boarding Houses, Tourist Homes, Fraternity and Sorority Homes	48		
	418W	Inns, Lodges, Boarding Houses, Tourist Homes, Fraternity and Sorority Homes	1		
	437	Parking Garage	10		
	438	Parking Lot	156		
	439	Small Parking Garage	9		
	446	Cold Storage Facilities	5		
	448	Piers, Wharves, Docks and Related Facilities	1		
	453	Large Retail Outlets	36		
	464	Office Building	256		
	465	Professional Building	139		
	470	Miscellaneous Services	9		
	471	Funeral Homes	27		
	472	Dog Kennels, Vetrinary Clinics	26		
	473	Greenhouses	18		
	474	Billboards	24		
	475	Junkyards	9		
	480	Multiple Use or Multipurpose	62		
	483	Converted Residence	360		
	484	One Story Small Structure	352		
	485	One Story Small Structure-Multi Occupant	150		
	500	Recreation and Entertainment	3		
	510	Entertainment Assembly	1		
	511	Legitimate Theaters	1		
	512	Motion Picture Theaters (excludes drive-in theaters	5		
	513	Drive-In Theaters	3		
	515	Radio, T.V., and Motion Picture Studios	3		
	520	Sports Assembly	1		
	521	Stadiums, Arenas, Armories, Field Houses	2		
	522	Racetracks	1		
	531	Fairgrounds	6		
	532	Amusement Parks	3		

534	Social Organizations	37
540	Indoor Sports Facilities	1
541	Bowling Centers	7
542	Ice or Roller Skating Rinks	1
543	YMCA's, YWCA's etc.	1
544	Health Spas	8
546	Other Indoor Sports	10
550	Outdoor Sports Activities	1
554	Outdoor Swimming Pools	8
555	Riding Stables	2
557	Other Outdoor Sports	23
560	Improved Beaches	4
570	Marinas	11
570W	Marinas	6
580	Camps, Camping Facilities and Resorts	1
581	Camps	27
581W	Camps	2
582	Camping Facilities	3
582W	Camping Facilities	3
590	Parks	39
590W	Parks	1
591	Playgrounds	32
592	Athletic Fields	32
593	Picnic Grounds	8
600	Community Services	18
610	Education	10
611	Libraries	26
612	Schools	109
613	Colleges and Universities	33
614	Special Schools and Institutions	45
615	Other Educational Facilities	31
620	Religious	321
631	Orphanages	3
632	Benevolent and Moral Associations	52

633	Homes for the Aged	14				
640	Health	3				
641	Hospitals	22				
641W	Hospitals	1				
642	All Other Health Facilities	57				
642W	All Other Health Facilities	1				
650	Government	25				
651	Highway Garage	40				
652	Office Building	39				
680	Cultural and Recreational	6				
681	Cultural Facilities	23				
681W	Cultural Facilities	1				
682	Recreational Facilities	93				
691	Professional Associations	3				
694	Animal Welfare Shelters	3	$200/parcel		$250/parcel	
	Total	**2977**	$	595,400.00	$	744,250.00
	Class B					
400	Commercial	12				
430	Motor Vehicle Services	7				
431	Auto Dealers-Sales and Services	75				
433	Auto Body, Tire Shops, Other Related Auto Sales	154				
434	Automatic Car Wash	8				
435	Manual Car Wash	7				
436	Self-Service Car Wash	5				
440	Storage, Warehouse and Distribution Facilities	15				
441	Fuel Storage and Distribution Facilities	34				
441W	Fuel Storage and Distribution Facilities	1				
442	Mini Warehouse (Self-Service Storage)	4				
443	Grain and Feed Elevators, Mixers, Sales Outlets	8				
444	Lumber Yards, Sawmills	25				
447	Trucking Terminals	31				
449	Other Storage, Warehouse and Distribution Facilities	264				
450	Retail Services	35				
451	Regional Shopping Centers	19				

452	Area of Neighborhood Shopping Centers	90				
455	Dealerships-Sales and Service (other than auto)	19				
460	Banks and Office Buildings	5				
461	Standard Bank/Single Occupant	29				
462	Drive-In Branch Bank	39				
463	Bank Complex with Office Building	10				
690	Miscellaneous	2	$800/parcel		$1,000/parcel	
	Total	**898**	$	718,400.00	$	898,000.00
	Class C					
414	Hotel	14				
415	Motel	32				
416	Mobile Home Parks	103				
423	Snack Bars, Drive-Ins, Ice Cream Bars	22				
424	Night Clubs	3				
425	Bar	49				
432	Service and Gas Stations	160				
454	Large retail Food Stores	19				
486	Minimart	34				
514	Auditoriums, Exhibition and Exposition Halls	2				
552	Public Golf Courses	18				
553	Private Golf Country Clubs	11				
583	Resort Complexes	1				
700	Industrial	1				
710	Manufacturing and Processing	115				
710W	Manufacturing and Processing	2				
714	Light Industrial Manufacturing and Processing	13	$1,600/parcel		$2,000/parcel	
	Total	**599**	$	958,400.00	$	1,198,000.00
	Class D					
421	Restaurants	120				
422	Diners and Lunchonettes	26				
426	Fast Food Franchises	20	$3,000/parcel		$3,750/parcel	
	Total	**166**	$	498,000.00	$	622,500.00
	Total Commercial Revenue	4640	$	2,770,200.00	$	3,462,750.00
	Total Revenue Commercial and Residential		$	6,904,549.80	$	8,555,392.80