EXECUTIVE SUMMARY

The Montgomery County Yard Trim Composting Facility (Facility) has demonstrated how to develop a formal Environmental Management System (EMS) meeting the international ISO 14001:2004 standard tailored to the particular operations of a yard trim composting facility. The Facility’s EMS is only the second such facility in the nation to be independently certified as in conformance with the ISO standard.

The Facility, located in Dickerson, Maryland, has been operating since 1983, and handles the yard trim composting from a population of one million people—about 67,000 tons per year. The Facility is part of Montgomery County’s integrated waste management system, which is achieving overall 60 percent diversion from landfilling.

The Facility is state-of-the-art and cost effective. It produces and sells both bulk and bagged Leafgro®—a high quality compost soil conditioner.

The County pursued a formal EMS, in conformance with the ISO 14001:2004 standard, to advance its environmentally progressive mission.

1.) Design of Composting System

Discuss the design of the composting system, and include photographs/schematics as necessary.

Yard trim (leaves, grass and brush) generated by a residential population of about one million (and associated business establishments) is received at the County’s centrally located transfer station. Since brush (woody materials) is not suited to rapid composting, woody materials are separated out at the transfer station, ground up, and directly sold as mulch. The remaining leaves and grass, also ground there, and typically amounting to 65,000 - 70,000 tons/year are transported 20 miles via rail or truck to a yard trim composing facility located near Dickerson, Maryland. It is this later Facility, which receives composts only leaves and grass, that is the subject of this application.

Key Features and Equipment

- 48-Acre Asphalt Pad
- 3 Stormwater Ponds w/NPDES Permits
- 80,000 sq. ft. Pavilion
- Office/Scalehouse Building Maintenance Building
- 5 10-CY, High-Lift Loaders
- 3 Windrow Turners
- 2 Rotary Screeners
- 2 Semi-Auto Bagging Lines

The composting Facility produces and sells both bulk and bagged Leafgro® - a high quality compost used extensively by landscapers and homeowners for soil improvement. Of outgoing products, approximately 90 percent by volume is Leafgro® (38 percent bagged and 52 percent bulk); about 10 percent is screened overs.
Demonstrate that the system is “state of the art”.

That the Dickerson Composting Facility is state of the art is demonstrated by many features:

**Asphalt Pad**: All composting operations, from receiving through curing and load out, take place on a 6-inch thick asphalt pad. This feature has several advantages over operating on bare ground. Operating on a firm surface avoids surface rutting and the mixing compost with underlying soil. It protects groundwater, and it enables the collection of all storm water into water management ponds without contamination by soil.

**Forebays**: Each pond is equipped with an engineered forebay, separated from the main pond by gabions. These forebays provide for pre-settling of suspended solids, which enhances the margin between permitted and actual suspended solids in the ultimate discharge. (The NPDES permit for the Facility limits pond discharge total suspended solids (TSS) to 100 mg/l.

**Pond Aeration**: We use floating aerators to manage BOD$_5$. (NPDES permit limits BOD$_5$.)

**Riser Valves**: All pond risers are equipped with control valves. This important design feature enables Facility operators to discharge to the waters of the State only when pond water has already tested compliant with NPDES permit limits.

**Stormwater Management Ponds Are Fully Lined**: This protects groundwater.

**Groundwater Monitoring**: As a sign of good faith with the host community, the County conducts groundwater monitoring via a ring of wells installed around the Facility. Twenty years of testing has detected no contamination.

**Fire-Fighting Water Capacity**: Water capacity on-site is provided by the three storm water management ponds with a combined capacity of 12.2 million gallons. In addition, there is a 300,000 gallon minimum available via a centrally located hydrant supplied from a tank at an adjacent County facility.

**24/7 Fire-Watch**: During all times that the Facility is unmanned (nights and weekends) a private security patrol service is employed, with assigned rounds designed to provide early detection of any fire. The watchman is also employed to take supplemental pile temperature at night.

**RFID**: The night guards’ rounds performance is validated by management via the latest RFID technology.

**Final Product Screening and Cleaning**: Detailed in Section 4, the Facility efficiently uses vacuum air separation to remove film plastic contaminants, and an overhead magnet to remove ferrous contaminants, all in constellation with a single-pass final product screening that yields both high quality Leafgro® and an “overs” that are so clean that they are now marketed for the manufacture of filter socks.

**Value-Added Bagging**: The Facility includes a redundant set of bagging lines and produces 500,000 bags per year. Bagging adds product value and market reach.

**Two Acre Covered Pavilion**: Provides an important dry area for final screening, cleaning, bagging, and storage of finished ready-to-ship bulk material free from excess dampness.
**Extremely Low Residue Generation:** The Facility has an extremely low (0.2 percent) overall residue generation rate (detailed in Section 4), and this is achieved with absolutely no compromise in Leafgro® quality.

**Pesticide Testing:** In 2009, as a sign of good faith to our customers and citizens, we tested our Leafgro® for all USEPA Priority Pollutant pesticides. Results indicated no need for further testing.

**Bioassay:** During the initial 2011 imprellis scare, we tested for the presence of clopyralid as well as imprellis using USCC recommended bioassay procedure, segregated 40 incoming batches of grass, and found no problem. Currently, as a precaution, however, we place new finished Leafgro® around indicator white pine species on site and monitor for damage. No imprellis problem was indicated.

**STA Seal:** The Facility also participates in the US Composting Council’s Seal of Testing Assurance (STA) Program, and proudly prints the STA seal on all its Leaggro bags. [http://compostingcouncil.org/seal-of-testing-assurance/](http://compostingcouncil.org/seal-of-testing-assurance/). Supplemental Material Exhibit 1 shows an example test result of a Leafgro® analysis under the STA program.

**Annually Calibrated Truck Scales:** Trucks scales are now the norm, but it should not go without noting that the use of modern automated truck scales, annually calibrated and certified for use in commerce, provides essential management information and supports correct and efficient billing.

**Weather Station:** In addition to a windsock, the County maintain a weather station on the Facility site that records wind direction and speed (among other parameters) and keeps this weather data available in real time, and archive-retrievable, online. Monitoring wind speed assures compliance with chassis tipping safety Standard Operating Procedure (SOP)—no tipping during winds over 15 MPH—and monitoring wind direction is used to comply with the Facility’s SOP for odor management. Historically, this archived weather data has been used to assist with investigating odor complaints. But there has not been an odor complaint since institution of the SOP over two years ago.

**Rail Haul:** Most of the inbound transportation of leaves and grass to the Facility is accomplished using rail cars and the balance via walking floor transfer trailers. This both minimizes the environmental impacts of necessary transportation, but also minimizes Facility contribution to host community traffic. Pictured at right is a yard trim rail box loading operation using gantry crane.

**Outbound Traffic Limited:** In order to minimize traffic impact on the host community, all product distribution from the site is limited to wholesale buyers. This is achieved by adhering to lower limits on the size of outgoing loads (40 CY bulk, 10 pallet minimum for bagged product).

**Teaching Facility:** Our composting operational processes meet or exceed all processing guidelines of the US Composting Council, and for the last three years in a row, the Facility has provided a host site for the US Composting Council’s Better Composting School.

**EMS Independently Certified ISO 14001:2004:** Lastly, but of foremost significance, as of July 27, 2013, the Facility became only the second yard trim composting facility in the United States with a formal Environmental Management System (EMS) that is independently certified as ISO 14001 compliant.
Discuss the merits of the system.

The merits of the above features are that in combination they enable the Facility to be an outstandingly responsible community neighbor and environmental performer. The merits of the pond system are multiple and worth expanding upon. All storm water that comes in contact with the composting operation drains into one of the three storm water ponds. The operation is able to collect and control storm water for the operation. There is always water available to irrigate the windrow pile—which is especially needed in the summer months when conditions are dry. Finally, for firefighting, there is a dry hydrant and a regular hydrant located at the middle pond to take water in the pond for daily site cleaning and fire control if needed. For fire control, the dry hydrant can draw directly from the middle pond, which has a capacity of 2.8 million gallons, and tankers could recharge from the other ponds if needed. In addition, we have always at the ready 300,000 gallons available via a regular hydrant, which is supplied from the fire safety tank located at an adjacent waste-to-energy facility.

The design protects the environment, including impact on human health, environmental quality and resources conservation. The operation is able to collect and monitor all the water that comes in contact with the operations and only discharge it when it is within the permitted limits.

Describe how the design protects the environment, including impact on human health, environmental quality and resource conservation.

The Facility recycles all incoming materials (less 0.2 percent residue). Ground water is absolutely protected as demonstrated by design features and 20-year monitoring. Multiple design features and operating protocols (discussed elsewhere) protect surface water, and operational protocols minimize impact on local traffic, odor, noise, dust and litter, yielding zero complaints.

Describe how the composting system is compatible with the local environment and integrated with and complementary to other local solid waste management systems.

The Facility is an essential part of the Montgomery County’s integrated waste system. The County’s other major solid waste facility, located in Dickerson, Maryland, is the Montgomery County Resource Recovery Facility (RRF), otherwise known as a waste-to-energy (or WTE) plant. Under the County’s integrated plan, leaves and grass are recognized as eminently recyclable and preferably recycled as compost. Also, due to their water content, leaves and grass are undesirable for using up expensive capacity at a WTE plant. Therefore, the County banned the practice of disposing of yard trim in trash, and built the subject composting Facility. That ban is demonstrated to be working as periodic sampling of county trash has shown that only 6 percent of all yard trim generated gets thrown in the trash. The County’s integrated system is working so well, as demonstrated by its current 60 percent diversion from landfills that the County has increased its recycling goal to 70 percent, and yard trim composting Facility remains an essential ingredient.

This single Facility is designed to handle all of the leaves and grass generated by the County’s one million residents and associated businesses. As such it, must fulfil this mission with keen sensitivity to the interests of its host community. Thus, the state of the art environmental management features listed above (e.g. features sensitive to groundwater and local traffic concerns) and the environmentally proactive EMS highlighted in this application.
Describe innovative or unique aspects of the composting system.

In response to a request to the County of the host community group called the Dickerson Area Facilities Implementation Group (DAFIG), to look into developing a formal Environmental Management System to manage the environmental aspects of the Facility, in January 2011 the County made the decision to initiate the development of a formal Environmental Management System (EMS) under the ISO 14001:2004 standard for operation of its Yard Trim Composting Facility that could be externally certifiable.

It was decided that the Fiscal Year (FY) 2012 would be dedicated to developing the program, and the County would seek external certification the following fiscal year. Maryland Environmental Services (MES), the operating agency and the DAFIG embraced the challenge. MES headquarters and the field staff were engaged to learn the standard and develop the procedures and programs needed under the standard.

The scope of the EMS covers all operations occurring on the composting facility site, but also important to the DAFIG was to include inbound and outbound transportation to the extent controllable by the county. The primary objective of the EMS is to provide a process-oriented approach to environmental management of the operation that allows:

- Develop environmental programs which take into account legal requirements and significant environmental aspects of its operation
- Prevent pollution
- Improve environmental performance, going beyond regulatory compliance
- Enhance the corporate image among regulators, customers and the public
- Continuously improve environmental performance

In June 2013, the accreditation company, American System Registrar (ASR), was retained to conduct the external certification audit. ASR’s detailed audit showed that the Facility had demonstrated continuous improvement in the areas of environmental performance, regulatory compliance and pollution prevention. As of July 27, 2013, the EMS of the Facility was registered as certified in full conformance with ISO 14001:2004 (Exhibit #2, Supplemental Material section). The certification is valid for three years, but is subject to annual external surveillance audits. With this certification, Facility became the second yard trimmings composting in the U.S. with an EMS that is independently ISO 14001 certified.

2.) Regulatory Compliance

Explain how the site is in environmental compliance.

Compliance with all applicable laws, regulations and other requirements is one of the four tenants of the formal Environmental Policy adopted by top management for the Facility. A facility cannot be known to be in compliance if it is not known what rules apply. The Facility is known to be in compliance by virtue of core EMS procedures. It is a requirements of ISO 14001:2004 to identify procedures “to ensure that all legal and other requirements applicable to the” Facility are identified and accessed.
Under the Facility’s EMS, a comprehensive Legal Review identified 35 different federal, state and local laws, regulations, and other requirements applicable to the Facility. One procedure under the EMS is a comprehensive annual “Evaluation of Compliance” protocol. Prior to the EMS, a compliance checklist existed, but was not comprehensive. The current checklists include over 250 questions that must be filled out by the Site Operations Manager annually, reviewed by MES Deputy Chief for Environmental Management, and any nonconformities corrected under a Corrective Action Procedure.

The ISO-compliant EMS Manual, itself a constellation of 14 key procedures, assures that among other things, continuous environmental compliance throughout the year. Under the EMS, the Facility now has a written Operations Manual with twenty-two written Standard Operations Procedures (SOP’s), which means personnel are trained on critical aspects of the operation and they are drilled on what to do to prevent environmental impacts, the potential environmental consequences of deviation from written procedures.

For example, to assure NPDES permit compliance under the EMS, an SOP was developed supported by a 25-page “STORMWATER MANAGEMENT PONDS OPERATING PLAN”. Over the last six years, the Facility’s actual monitored NPDES discharges have averaged only 16.5 (mg/l) TSS and 18.6 mg/l BOD5—achieving 83.5 percent and 81.4 percent margins, respectively, below allowed discharge limits.

Independent certification of the EMS (Please see Supplemental Material, Exhibit #1), confirmed that the Facility is operated in a manner that goes beyond merely ensuring compliance with environmental rules and regulations. It indicates that the Facility operators and employees consistently consider the environmental aspects of their activities, identify and mitigate environmental impacts, and continuously strive to improve their environmental performance.

➢ Describe and include in supporting documentation any awards, letter of support or facility inspection data.

Please see Supplemental Materials, Exhibit 3, for a letter of support from the Facility’s host community, the Dickerson Area Facilities Implementation Group. This is particularly significant in that the host community, as would be expected, is a keen watchdog with respect to compliance.

➢ Describe any regulatory citations received and how problems were corrected.

No citations have been received by the facility over the last 10 years. Maryland Department of Environment, the regulatory entity, has inspected the facility four times and so far no regulatory citations have been received.

3.) Planning

➢ Describe the design and effectiveness of the facility’s planning process

The Environmental Management System (EMS) follows a “Plan-Do-Check-Act” cycle that involves four steps: 1) Developing an Environmental Policy specific to the Facility; 2) Planning (detail in Section 3 of this application); 3) Implementation; and 4) Checking and acting to assure continual improvement.
The Planning Stage requires the identification of the Facility’s “Significant Environmental Impacts” (SEI) of the composting process and all the ancillary operations within the scope of the EMS. In ISO parlance, an environmental “aspect” is “an element of an organization’s activities, products or services that can interact with the environment”, and an “impact” is “any change in the environment, whether adverse or beneficial, wholly or partially resulting from an aspect”.

To develop its list of SEIs, the EMS team took a process-oriented approach to inventorying all environmental aspects and impacts within the scope of the EMS, taking into account the clauses of the agreement signed with the SCA. All physical processes within the scope of the EMS were identified (e.g. inbound transportation, receiving, windrow creation and management, curing, screening, bagging, storm water control ponds, equipment maintenance, fuel storage, administration, etc.) and broken down into sub-processes, and then potential environmental impacts described for each. This was essentially a brainstorming exercise, and forced out-of-the box, global thinking about the potential environmental consequences of all site activities. A list of 182 aspects and impacts was generated. With input from the DAFIG, the detailed list was then rank-ordered and common impacts were consolidated and combined, yielding a short list of SEIs.

➢ Provide examples of the process in action

The next step in the planning process was to develop environmental management programs to address and improve performance (details in the Section 4 of this document), relative to its SEIs. Programs must have stated objectives to address aspects generating an SEI, measurable targets to reduce an SEI, designated responsible parties and timelines. Currently, the Facility’s staff is working on nineteen Programs focused on the following Aspects (and associated SEI):

- Decomposition of yard trimmings in windrows (potential for fire hazard and odors)
- Trucking transportation from the transfer station to the Facility (traffic and air pollution)
- Machinery operation (air pollution)
- Pond discharges (water quality degradation)
- Dust generation (dust as air quality degradation)
- Oil spill management (surface and/or groundwater contamination)
- Impurities coming out of the windrows as a form of litter (visual contamination)
- Use of electricity across the Facility (air pollution)
- Green purchasing (use of natural resources)
- Lighting efficiency retrofit (air pollution, indirect greenhouse gasses)

The EMS process and resulting Environmental Management Programs at the Facility are described in an article published in the January 2014 issue of Biocycle.

➢ Describe how planning addresses any system down time

In order to maximize service to the citizens of Montgomery County, the Facility receives material on a year-round basis. Thus, there is no scheduled facility down time. However, during the two months of October and November, the Facility experiences relatively low material flows. Annual preventive maintenance is planned into this period. Partly as a result of this efficiency, over the past five years equipment availability (loaders, turners, screeners, flusher truck) average over 90 percent.

1 http://www.biocycle.net/2014/01/20/county-yard-trimmings-facility-achieves-ems-certification/
4.) Performance, Economics & Cost-Effectiveness

➢ Describe how the facility measures success.

Under the EMS, the Facility now gages success using an array of new measures developed pursuant to each of nineteen new Environmental Management Programs (EMPs) wherein success is measured relative to EMP-specific targets. These are discussed in some detail below under “Discuss whether operational performance equals or exceeds the goals and expectations, and compares with similar systems”.

The Facility also continues to measure success according to the following classical, pre-EMS measures: (1) Worker Safety, (2) Budget and Cost-Effectiveness, (3) Regulatory Compliance, and (4) Composting all leaves and grass received for composting together with successful distribution of products into the recycling marketplace.

There have been no OSHA-reportable events in the past 10 years, demonstrating achievement of the first measure. On budget cost-effectiveness of the Facility is detailed below in this Section 4, under the discussion of “…budget and whether costs are appropriate”. Compliance with all regulations is achieved as discussed above in Section 2, “Regulatory Compliance”. All but 0.2 percent of incoming materials are composted and sold into the recycling marketplace demonstrating performance on the second measure.

This last achievement is described in supporting detail in the next subsection regarding the Facility’s waste screening procedure.

➢ Explain the facility’s waste screening procedure

Under our screening and cleaning system there is virtually no waste, and this is achieved in one pass. After curing, all compost is feed through one of two drum-style screeners equipped with three-eighth inch (3/8”) screens to improve the quality of the finished compost. Screening to this size removes twigs and larger pieces that have not yet broken down, as well as impurities such as film plastic, tennis balls, pet toys, metal and other items that would be regarded by the Leafgro® market as contaminants.

On a volume basis, about 10 percent of the screener throughput is comprised of such oversized materials, “overs”.

Importantly, each overs out-feed conveyor is equipped with both an overhead magnet and an air classifier. In this way, the overs are cleaned on the same single-pass while the final Leafgro® is produced. There is no re-grinding, re-cleaning, or subsequent processing. The magnet is a Douglas, model CBM42, and the air classifier is of Murphy make with a Kubota engine model 15 inch EMLSARR4. Pictured to the right is thus-cleaned overs. About 8,000 tons of clean overs are generated from this screening
process per year. Of that, about 1,000 tons are used at a closed County landfill manage leachate, and about 7,000 tons are marketed to a business that uses it to make filter socks.

Pictured to the right is ferrous metal (look closely, these are mostly old rusty nails) removed by the overhead magnets for recycling. The magnets remove about 10 tons per year of this metal which would have been contaminants to Leafgro® customers, but add revenue and tonnage to the County’s recycling credit.

Even though residents are required to use paper bags or reusable containers in the County’s curbside collection program, plastic bags continue to slip into the collected material. Eventually, windrow turners at the composting Facility, break the plastics into small pieces—one plastic bag easily becomes hundreds of tiny shreds. However, the vacuum air separators on the overs out-feed belt removes these contaminants from the Leafgro® product.

In the end, about 135 tons of vacuumed-off dirty film plastic and tennis balls remain as a minor waste stream from the Facility per year. That is only about 0.2 percent of the incoming tonnage—an extremely low residue rate as compared to any modern composting facility.

This efficient one-pass screening system results in our fine, clean contaminant-free Leafgro® product pictured right.

➢ Discuss whether operational performance equals or exceeds the goals and expectations, and compares with similar systems.

Programmatically, each of the nineteen Environmental Management Programs (EMPs) has its own measure of success which is the defined target. There is success for each EMP when its target is attained and ongoing success as EMPs are maintained. Below are some examples of how the performance of several EMS programs have achieved or exceeded expectations:

Eliminating a Fire Hazard: Producers of high quality composts are familiar with the problem of “overs”. In order to meet the most discerning of compost market expectations, oversized materials (woody twigs plus errant bits of film plastic and metal) must be screened out of the compost product. In the case of Leafgro®, product screening yielded roughly 8,000 tons/year of oversized material. Prior to the EMS, this material was further processed by tub grinding and then rescreened to produce a product acceptable to nurseries (though at about half the selling price of bulk Leafgro). This extra processing was relatively expensive, and also had environmental drawbacks that were brought under scrutiny by the EMS. Not only was the grinder a fuel guzzler, but with two engines and the tendency of fine particles to
accumulate on hot metal machine surfaces, grinding represented a real potential source of fire at the Facility. Addressing both the fire hazard and fossil fuel consumption, an EMS Program was created with the objective of marketing overs without any grinding. The challenge was to increase the efficiency with which the existing belt magnet and vacuum devises (located on the overs out-feed conveyor) removed errant bits of film plastic and metal such that a buyer could be found for the unscreened woody overs. Effectively, this meant increasing the single-pass removal efficiencies for film plastics and metals from about 65 weight percent efficiency to over 90 percent without purchasing added equipment. Over a period of about 12 months, with persistent tinkering and adjustments to the existing overhead belt magnet and vacuum devices, MES mechanics were able to achieve sufficient purity. A new “clean unground overs” product is now generated and sold to a happy buyer and recycled. The grinder is gone along with attended fuel use and threat of fire.

**Fossil Fuel Consumption by Inbound and Outbound Transportation:** Although transportation contractors’ fuel savings may not necessarily accrue to the county, it was recognized there that could be environmental benefits from more fuel-efficient transportation. The following steps have been taken:

- Established a Standard Operating Procedure (SOP) that assures maximum use of rail haul in lieu of trucking for inbound materials. All leaves and grass must be transported 18 miles from the County’s Transfer Station to the Composting Facility. Both rail (more environmentally benign) and truck haul are available, but rail car availability is limited and ad hoc. During the FY2013 almost 60 percent (by weight) of yard trimmings was received by rail—an historical high. This was achieved by 100 percent adherence to the SOP.
- Similarly, the efficiency of outbound transportation of all outbound product (Leafgro®® and clean unground overs) was improved by 5.7 percent, measured in terms of outbound tons per truck trip. (All product is distributed by truck, not rail.) This was achieved by strict adherence to a minimum 40 cubic yard truckload size for bulk product and an eight pallet minimum for bagged product. In addition to indirectly reducing air emissions, this traffic improvement was important to the host community.
- Targeted stakeholder outreach communication to the inbound trucking contractor, Team Transport, Inc., regarding the EMS and its objectives, has reportedly resulted in accelerated fleet replacement of six (rather than four) tractors plus voluntary purchase of “inside-outside doors” for all walking floor trailers which can reduce drag fuel usage significantly. This illustrates what can be achieved by the simple act of outreach to a stakeholder about environmental objectives.

**Fossil Fuel Consumption by On-Site Equipment:** The list below is a summary of programs aiming at increasing fuel consumption efficiency. These programs yield to 8,895 gal of fuel savings equivalent to 90 metric tons of CO₂ per year.

- One loader replacement by the County has already reduced loader fuel usage by about 2.06 gallons/operating hour (a reduction 2,400 of gallon/year).
- FY13 was a more efficient operation with 0.81 gal/ton composted compared to 0.91 gal/ton in FY12.
- Since 2011, approximately 40 acres of site maintenance mowing was turned over to a local farmer for agricultural grass production. Since a local farmer would otherwise had to have produced the same amount of grass for feed, using the same equipment and fuel as he now uses mowing the Compost Facility site grounds, all of the emissions that were previously generated by the Compost facility mowing operations on this acreage generate net reductions in emissions to
the region. This was not only at no cost to the County, but actually saved the County the cost of temporary laborer previously needed for site mowing as well as fuel.

**Dust Generation by Windrow Turners:** Dust generation by machinery, and the potential resulting degradation of local air quality, was judged a Significant Environmental Aspect and Impact. Acting as a responsive Environmental Management Program, two talented mechanics used their ingenuity and in-house materials to build in a canopy for a Backus windrow turner, thus reducing dust and saving the county a significant expense.

**Site Litter and Odor:** As noted above, other Significant Environmental Impacts included site litter and odors. After 18 months of implementing two new SOPs to address litter and odor, and increasing regular litter patrolling of the fence line, it was decided to measure the perception of both site cleanliness and odors by tour visitors as well as regular visiting truck drivers by polling them during the spring and fall months of 2013. The impressive results are detailed on page 17, under Litter Removal.

**Green Purchasing of Office Materials and Bagging Supplies:** This EMP starts with buying recycled-content office supplies for the Composting facility, and then aims to replace the current petroleum-based plastic bags (that we sell Leafgro® in) and pallet covers with bio-based alternative durable film plastic, as bio-based materials become available.

- **Describe the system’s experience with downtime, including how much, how long and how resolved.**

The system experienced a three day down time in 2002 due to an onsite fire on a weekend when the site was closed. Due to the agreement with the community, the operations at the site are limited to Monday through Friday with no weekend operations. Since there was no one on site after Friday shut down, there was no temperature monitoring during that weekend and leaves stored on site caught on fire. It took the fire department two days to totally put out the fire. After the fire, the County negotiated with the community to have a security guard present at the site after hours. The security guard monitors temperature of the windrows after hours and on weekends when the site is closed.

- **Describe how the organization fosters customer service**

MES is responsible for product marketing. Products are marketed to distributors, garden centers, and to other wholesale purchasers throughout the Mid-Atlantic Region. Big box stores and garden centers cater to regional homeowner and landscaper demand by carrying bagged Leafgro®. Most garden centers carry both bulk and bagged Leafgro®. In recognition of outstanding marketing results, MES and Montgomery County were awarded the SWANA Gold Marketing Excellence Award for 2012 — the top marketing award available. Leafgro® has been used to enhance notable Washington-Baltimore area places, such as: FedEx Field, Raven’s Stadium, Oriole Park, and the Vice President’s Residence.

From the moment that each customer enters the facility, until the time he leaves — each is treated as our most important customer — because they are! How good are we? Every driver is greeted with a smile, weighed in and directed to the appropriate loading area — be it bags or bulk. They are greeted with that same smile when they are weighed out.

MES strives to load trucks as quickly, efficiently and safely as possible — utilizing multiple loaders or forklifts, if needed. CB radios are installed on all loaders so that the scale house and operators are in constant communication to better serve our customers. These radios also enable the operators to communicate with the truck driver as the order is being loaded. Loaders equipped with bucket scales
enable bulk loads to be maximized without an unexpected need for offloading upon outbound weighing over truck scales. Likewise, pallets weights are monitored to avoid the need for any unexpected offloading of a pallet upon outbound scale visit. With calibrated scales, MES assures that no truck, flatbed or walking floor, leaves overweight, while maximizing each payload, and as a result, site turnaround time is never an issue raised by our buyers.

Our customer service does not end when the loaded truck of Leafgro® leaves our site. If ever a customer notes a torn bag, there is never a question and the customer is credited. Because of the effort put into producing our consistent quality Leafgro®, backed by our customer service, the retailer owner and, in turn, the end use customers, remain happy with our outstanding product.

➢ Explain whether the system operates within its budget and whether costs are appropriate.

The composting Facility, itself, consistently operates within budget and its unit cost, as compared with other solid waste management operations is quite favorable. For the five-year period FY09-FY13, the County’s cost center which tracks both the grinding operations at the transfer station and the composting Facility has ended each year, except one, with a budget surplus. The exception was due to unbudgeted expenses within the grinding operation, not the composting Facility.

The chart at the right details the composting Facility’s actual annual unit cost, net of product sales, for the five year period FY09 through FY13. The costs of pre-grinding operations which are located off-site, at the County’s transfer station are also shown, for comparison, since a typical composting facility may well have those operations on the same site. (For the same reason, intra-facility transportation costs, which averaged $9.81/ton are included in the chart.) Note that those grinding operations yield large off-setting revenues from mulch sales, just as Leafgro® sales offset composting Facility costs. As can be seen, unit costs for these operations are highly favorable compared with other solid waste management alternative and in comparison to other compost facilities where full cost accounting followed.

➢ Describe how long it has taken, or will take, for the organization to recoup costs for the facility or program.

The EMS was developed by an in-house team composed of County and MES personnel augmented by very limited outside consulting as detailed below. MES used some staff time updating documents such as the Emergency Preparedness and Response Plan, the Health and Safety Plan, the Storm Water Pollution Prevention Plan-SWPPP, and the Spill Prevention, Control and Countermeasure Plan-SPCC.

- There were no capital costs incurred due to the EMS program.
• In FY11, $1,967 was spent on an outside consultant with EMS experience to do an initial assessment of the program and give the County some initial advice.
• In FY12, $6,685 was spent; this was for MES Staff time to work with the County to begin developing and implementing the program.
• In FY13, $14,656 was spent. Of this amount, $3,600 was for an outside EMS certification auditor, and the rest was for MES staff time.
• In FY14, $9,892 is budgeted for the maintenance of the EMS program. This includes just $1,100 for an outside surveillance audit, and the rest will be for MES staff time.
• It is anticipated that a similar amount will be spent in FY15.

Against these EMS program costs totaling $33,200 since program inception, an offsetting amount, $27,000, has been saved just during FY13 as a result of various EMPs developed under the EMS:

• Fuel savings (7,350 gallons) from suspension grinding operations totaling $22,345.
• Fuel savings (1,419 gallons) achieved via scheduled replacement of a loader but with a more efficient engine yielding $4,314 in fuel savings.
• Fuel saved (126 gallons) from avoiding moving the 40 acre site, now handled for free by local farmer), saving $383.

Canopy for Backus: MES staff used in-house materials to build in a canopy for a Backus windrow turner to reduce dust at the site. This meant dust reduction as well as monetary savings of $18,000.

The MES costs noted above simply represent timesheet recognition of MES staff that, in the absence of the EMS, would likely have been recognized as part of normal composting operations. That is, no MES staff were added or deleted for the EMS. For example, in addition to developing a needed overall Operations Manual for the Facility, MES used staff time updating regulatory documents such as the Emergency Preparedness and Response Plan, the Health and Safety Plan, the Storm Water Pollution Prevention Plan-SWPPP, and the Spill Prevention, Control and Countermeasure Plan-SPCC and training—all necessary to assure regulatory compliance.

As detailed above, only about $6,700 of the EMS development expenses were out-of-pocket (non-staff) costs. In comparison, based on FY13 savings of $27,000 generated from EMS programs, it can be stated that with respect to out-of-pocket (non-staff) costs, the EMS programs have already paid back four times over—small pickings, perhaps, but in the right direction and growing more meaningful in the long term.

What is not accounted for in the foregoing is County staff time that was utilized in EMS development, which time could have been spend working on other projects had the County not chosen to develop an EMS for its composting facility. This diversion of staff time is estimated to have been approximately one and one half person years at the planning specialist level. Thus, while it cannot be said that the EMS has paid for itself with respect to initial staff time for development, the temporary diversion of staff time for initial EMS development was found to be quite tolerable, and as discussed below, quite worthwhile.

➤ Explain how return on investment funds, if any, are applied to enhancing programs, doing educational outreach, or being applied to other community endeavors.

Montgomery County’s legal system of finance requires full cost accounting and that all solid waste programs are fully paid for by a separately accounted solid waste fund (Montgomery County Code, Chapter 48), which fund is fully supported by solid waste charges and which fund cannot make a profit nor be used to subsidize the County’s general fund. Thus, by operation of full cost separate fund
accounting, the County’s solid waste rate payers automatically receive the benefits of the Facility’s cost-effectiveness.

5.) Use of Equipment/Systems and Technologies

- Thirty rail boxes are used to transport at least 60 percent of the feed stock by train to the Facility. The rest of the feedstock is brought to the Facility through a contract by a private contractor using tractor trailers.

- A Mettler-Toledo scale is used on site to measure incoming and outgoing material. This ensures that per the agreement with the community, the Facility does not take in more than 77,000 tons per year. It also ensures that vehicles do not leave the Facility over weight.

- Five front end loaders are used to build windrows, move material and load finished products. These include two made by Caterpillar, two by Volvo and one by Mitsubishi.

- Three windrow turners are used to turn material in windrows. This includes two made by Backhaus and one by Scarab. (Backhaus pictured here.) The advantage of windrow turners is that they mix the composting material homogeneously and uniformly reduce particle size. They do a better job than using only the loaders to turn the composting material. They also allow for building windrows as high as 8 feet high, and as long as desire — the only limitation of being the size of the composting pad.

- A system of irrigation pipes is used in the dry season when moisture is needed to irrigate rows, and a water truck is used to take water from the ponds. Windrows are irrigated also to control dust and to clean the site. The water truck is also available for fire control.

- A system of irrigation pipes is used in the dry season when moisture is needed to irrigate rows. Three REOTEMP Compost Thermometers are used for monitoring the interior temperatures of compost piles and windrows. These thermometers are calibrated monthly.

- Two screeners are used to screen the finished compost. One McCluski and one Phoenix Screener (pictured on page 8) are each fitted with a magnet and an air classifier used to screen the finished compost. Discussed in Section 4, the magnets pull out metals that would be in the compost and the air classifiers remove any plastics from the finished compost.

- Bagging is accomplished on-site using two Amadas electric bagging lines complete with palletizers. These lines require six laborers, including a palletizer and forklift operator. Each filled bag is 1.5 cubic feet using a standard volume for calibration, and each pallet contains 50 bags. An experiment with 1 cubic foot bags demonstrated a market preference for the 1.5 cubic foot bag. The site produces 500,000 bags per year.
6.) Worker Health & Safety 10 points

- Describe employee training frequency and topics

Safety meetings are conducted on a weekly basis to provide employees with additional operational/safety procedures. Any safety concerns with daily operation or specific tasks are addressed and corrective action is implemented; this could include additional employee training. There is a Job Hazard Analysis (JHA) for each activity. All training is documented and records are kept by the Safety Department according to the State’s record retention policy.

The number one priority is to eliminate or control fire hazards at the Facility, to accomplish that, several programs were established: 1) implementation of smoking ban at the Facility, 2) revision of the Emergency Preparedness and Response Plan to include specific situations that a compost facility could meet, 3) fire drills with field personnel and local fire department staff. These fire drills are focused on practicing specifics of how to deal with fires generated in a composting pile, not only how to manage regular fires, and 4) elimination of grinding operations at the Facility.

Odor is also a potential health issue at any composting facility. Under our EMS the Facility has a specific SOP that directs a series of actions under circumstances that can potentially generate odor (e.g. wind direction can determine where to unload any smelly grass). As a result, there has not been an odor complaint regarding the composting Facility since the SOP was established in 2011.

Safety procedures include a combination of regular inspections of the MES Safety Department Staff, 29 formal JHAs, and weekly safety trainings. These procedures explain why the site has not had a single OSHA reportable accident in over 10 years. This is for a facility that logs approximately 20,000 man-hours per year—no OSHA reportable in over 200,000 man-hours of work.

7.) Public Acceptance, Appearance and Aesthetics

- Describe the maintenance program for keeping the facility and vehicles clean and aesthetically pleasing

There are several maintenance activities that occur on a periodic basis to ensure that the Facility and vehicles are well maintained.

**Preventative Maintenance (PM):** All equipment follows specific requirements recommended by the manufacturer, typically based on the run hours of the equipment. Daily “walk around” inspections are conducted on each piece of equipment before use. Any unusual wear is noted and reported to the Site Supervisor. This insures that problems are identified early, before a major breakdown occurs, and it also confirms that essential safety factors and equipment are present and functioning as required. For each item of equipment, a maintenance log book is maintained by an individual assigned by the Operations Manager. All repairs actually performed are recorded in the maintenance log book, with initials of the individual performing the work, for the specific piece of equipment. All the equipment is cleaned once a month or more frequently if needed.

**Building Maintenance:** The structures at the Facility are inspected periodically to detect any areas that may need addressing. Repairs are made as soon as problems are identified.
Asphalt Pad Maintenance: Repairs are made to the asphalt pad, routinely costing $50,000 to $100,000 each year. If this is not done, the site would become more costly to repair in the long run.

Mowing of Grass: During the spring and summer, the grass at the site is maintained on an as needed basis. The Facility has riding mowers, farm tractors and weed eaters to control the grass. Large grassed areas outside operations area but inside the main fence is managed by allowing an outside farmer to mow and bale grass as needed.

Martinsburg Road Clean-up: The Facility has adopted about 2 miles of road coming to the Facility under the Adopt-A-Road program.

Vehicles: Weather permitting, loaders and windrow turners are cleaned on a daily basis using the water truck, to manage unwanted material buildup. In addition, all vehicles and loaders are cleaned inside the shop during monthly PMs, and this cleaning includes the interiors and detailing. All vehicles are also inspected for stray trash, oil leaks and cleanliness as part of each quarterly Spill Prevention and Control Countermeasure (SPCC) inspection, and all on-road vehicles are inspected for trash, oil leaks and cleanliness by the site mechanics on a monthly basis. We use a pressure washer whenever needed without any type of soap or chemicals. If degreasing is needed, a subcontractor is used to wash the loaders and vehicles and the subcontractor collects all the water used and takes it off site.

Litter Removal: During the windrow turning process, especially on windy days, bits of film plastic in the compost gets dispersed and attaches to the perimeter fencing. The Facility is cleaned as needed by cleaning the fence line, at any giving time the Facility looks great, free of odors and debris, that is corroborated by a recent perception survey (see last item in this Section). After 18 months of implementing two new SOPs to address litter and odor it was decided to measure the perception of both site cleanliness and odors by tour visitors as well as regular truck drivers entering the Facility by polling them during the spring and fall months of 2013. The results were as follows:

- Ninety-one percent of the visitors did not perceive litter at the facility. When asked to quantify how cleanliness, 71 percent said it was “clean” and 24 percent “spotless.” Seventy-three percent did not perceive any kind of odor at all.
- Ninety-three percent of the truck drivers did not perceive any litter on the fence or any odors. When asked about the cleanliness, 100 percent considered the site either “spotless” (78 percent) or “clean” (22 percent).

➢ Describe public relations measures and public education information

Public relations and public education are a hallmark of Facility operations under the EMS.

- Educational tours have increased over the last three years for 9 to 15 per year.
- Facility’s Environmental Policy is posted at the Facility and on the County’s website.
- Stakeholders are reminded annually about the Facility’s EMS and its Environmental Policy.
Host community (DAFIG) was highly involved in the EMS development and under the EMS the County both periodically reports to and receives input from the community through the DAFIG.

The County conducts quarterly meetings with the community representatives.

The Staff at the Facility periodically update its contractors, suppliers and buyers of developments of the EMS that they should be aware of any changes in: the Environmental Policy, the list of Identified of Significant Environmental Aspects and Impacts, and any standard operating procedures that relates directly to that contractor, supplier or buyer.

The Facility completes a Daily Site report is compiled by MES onsite personnel and every six months to the Sugarloaf Citizens Association (SCA) representative per the SCA-County Agreement.

County Management and/or MES Management communicate, to all interested parties, the attainment of milestones through press releases. The last occasion was when the EMS of the Facility got certified in ISO 14001:2004. See Montgomery County Press Release.

Provide evidence that the facility is a good neighbor

As described earlier, the County has an agreement with a citizens’ association in the community, (SCA) that governs some aspects of site operations. The County meets formally with SCA twice a year to ensure that agreement is being adhered to, but we also maintain frequent and very cordial functioning relationship with SCA representatives.

Likewise, the County works very closely with the Dickerson Area Facilities Implementation Group (DAFIG), the group chartered by the County Executive with membership appointed by the County Council to advise the County with regard to its solid waste facilities in the Dickerson area. This work includes quarterly formal meetings plus more often with a DAFIG subcommittee on developing and implementing the EMS.

Through these organizations, the host community has expressed, both orally and in writing, their satisfaction with the operation of the Facility proving to be a good neighbor. Upon the County receiving the EMS certification, the SCA representative emailed that the County ‘should be commended” and spoke most highly of the Facility at our EMS celebration. Please also see Supplemental Materials, Exhibit 3, which is a letter of support from the DAFIG.

The County Department of Environmental Protection has a formal procedure for receiving, recording and responding to complaints related to the operation of any Montgomery County’s solid waste management facilities. Not only have there been no substantiated complaints, but not even a single complaint has been received by the County regarding the Facility in over three years.
## Supplemental Materials

### Exhibit 1. Example of the Results of a Leafgro® Analysis

![Image of Compost Technical Data Sheet]

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<tr>
<th>Compost Parameters</th>
<th>Reported as (units of measure)</th>
<th>Test Results %, wet weight basis</th>
<th>Test Results %, dry weight basis</th>
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Participants in the US Composting Council’s Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: Oct. 13 B  
Laboratory Number: 3100336-1/1  
Analyst: Assaf Sadeh  
www.compostlab.com
Exhibit 3. Letter of Support for This Award Application from the Facility’s Host Community

DICKERSON AREA FACILITIES IMPLEMENTATION GROUP

April 18, 2014

The Solid Waste Association of North America
1100 Wayne Avenue Suite 650
Silver Spring, MD 20910

Dear SWANA:

I am writing in support of an application being submitted by Montgomery County Maryland for SWANA’s 2014 Composting Systems Excellence Award.

The Dickerson Area Facilities Implementation Group (DAFIG) is a citizens’ advisory committee chartered in 1998 by the Montgomery County Executive and County Council to advise the County regarding operations of the County’s multiple solid waste facilities located, or planned to be located in the Dickerson, Maryland area. These facilities include an operating waste-to-energy facility, land for a possible future landfill, and a yard trim composting facility.

The DAFIG works with the County to implement a formal Facilities Master Plan, a plan developed to mitigate the community impacts of operations at these solid waste facilities. The DAFIG meets with the County on at least a quarterly basis to: receive updates on facility operations, receive presentations on special studies that the County performs pursuant to the Master Plan, discuss any concerns we have, and generally give input on issues as they arise. In between meetings, we also stay informed and give input via subcommittees and via email and phone.

The DAFIG had encouraged the County to develop a formal Environmental Management System (EMS) for the Composting Facility, and we had specifically recommended that the County follow International Standards Organization (ISO) 14001 standards. As a result, of embracing that recommendation, and of the DAFIG working with the County, the existing EMS goes beyond regulatory compliance and has established a formal process of continual improvement.

On July 27, 2013, the Composting Facility received the ISO 14001 certification for its EMS from American Systems Registrar (ASR), an independent internationally accredited environmental management systems firm. That certification confirms that the facility is operated in a manner that goes beyond merely ensuring compliance with environmental rules and regulations, it indicates that the facility operators and employees consistently consider the environmental aspects of their activities, identify and mitigate environmental impacts, and continuously strive to improve their environmental performance.

The DAFIG is pleased with this County achievement as it shows what can be done when the government and the community work together.

Sincerely,

Richard Hill, Chairman