SWANA 2009 COMPOSTING SYSTEMS EXCELLENCE AWARD

CAMARERO RACETRACK COMPOSTING CENTER
CANOVANAS, PUERTO RICO

PRESENTED BY

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EXECUTIVE SUMMARY

On January 4, 2007, Camarero Group purchased the only racetrack in Puerto Rico known as El Comandante Racetrack. The administration immediately established different strategic to improve the operations of the facility in a cost-effective manner.

One of the primary concerns was to address the financial burden that represented the high cost of the solid waste disposal and green areas maintenance of the facility. A composting project that dealt with such material coming from the horse bedding was non-existent in Puerto Rico. After analyzing different alternatives, budget and investment, in March 2007, Camarero Group established a Compost Center using the Ag-Bag system to handle the waste disposal of 1,123 horses at the track which consisted of 150 yds of daily straw bedding.

The management of solid waste at the Camarero Racetrack facility had a cost of $122,000 a month. After the compost program was established, the monthly cost was reduced to an average of $12,600 (See invoice of November 2008 included in the attachments). The composting system has reduced the disposal costs by $2,600,000 in the last twenty-six months.

Operating costs for the site have been made possible by the major cost savings provided by the compost system, even when the cost of fuel increased. The daily operating costs lie at around $780 and savings from solid waste disposition are around $3,300, including additional savings and human resources management and use of infrastructure of $2,520 per day.

This is the only compost facility established at a racetrack in the Caribbean. It will be a great example for SWANA chapter to show and encourage other to get involved.
BACKGROUND INFORMATION

Horse Racing history in Puerto Rico dates back to 1882. Puerto Rico's horse racing industry is rich in history, producing many horses and jockeys that have become local heroes. As time went by, a horse caught the attention of the horse racing industry worldwide. His name was Camarero, winner of 56 consecutive races; a world record established in the 50's that still stands today recorded in the Guinness' Book of Records. There are other horses with outstanding performances both in Puerto Rico and the continental United States - Bold Forbes, who won the 1976 Kentucky Derby and the Belmont Stakes, ridden in both races by Angel Cordero Jr., the most famous Puerto Rican jockey; Mister Frisky, who started his career in Puerto Rico and headed with 16 straight winnings being the 1990 Kentucky Derby as the favorite. The racing activity in Puerto Rico is highly regulated by the government making it one of the safest of the hemisphere. "Camarero" is the only horse racetrack in Puerto Rico, and the largest and most modern of the Caribbean. It is located in the northeastern region of the island of Puerto Rico, at the town of Canóvanas. Camarero Race Track is owned and operated by Camarero Race Track Corporation (Camarero Group), a corporation organized under the Laws of Puerto Rico, composed by local investors who are also horse owners, fully committed to maintaining Puerto Rico's horse racing industry as leader in the Caribbean Region and taking it to its next level of excellence.
Camarero Group acquired the racetrack on January 4, 2007 and on the same date was issued a permanent license to operate the **only racetrack** in Puerto Rico. Camarero Group immediately established its Strategic Plan to improve the operations of the racetrack. It entered into an agreement with Scientific Games to modernize the Totalisator Communications System for its 700 Off-track-betting parlors (OTB's). In addition, an agreement was also entered into with Scientific Games to expand the simulcast of Camarero's Races to the Caribbean Region and other States in the Continental USA.

Camarero Group has already committed millions of dollars in capital expenditures such as: improvements to the dirt track, a new State-of-the Art Billboard, and a $4,000,000.00 program to purchase horses and to grant loans to horse owners. This extremely successful program began with the April 2007 OBS auction. In addition, improvements to the Barn Area, Clubhouse and Grandstand are underway. There are around 1,123 horses at the track with a disposal of about 150 yds; of straw bedding. The bedding is about 5 percent manure.
1. DESIGN OF COMPOSTING SYSTEM

In March of 2007, Camarero Group decided to use the In-Vessel Composting System to manage and process the bedding waste from the stables because of two major reasons: space limitations and off side effects of the composting process versus leachate management and odor control. The goal was to consistently produce quality compost in a reasonable amount of time with infrequent or no odor problems as well as minimizing issues with liquid leachate, vectors and other environmentally undesirable factor. The Ag-Bag7 is a sealed storage system that stores silage, haylage and high moisture grain in oxygen limited and durable plastic bags. Each bag measures up to 200 feet in length and 10 feet in diameter. The bag is able to absorb between 3 to 4 days of horse bed residuals. The system ensures aerobic packing and compaction and reduces weather risks. The exterior white layer of the Ag-Bag repels solar heat and keeps the content cooler. This is obtained by its unique 3-ply construction. It contains UV inhibitors to resist sun damage; therefore, Ag-Bags can last up to two years under rugged conditions. This represents a cost-effective factor that was also considered when choosing the composting method that best applied to the collection, storage, and composting of yard waste, race track stable bedding and other processing residues at Camarero.

Camarero produces around 150 yards; of bedding waste per day. Around 10 to 12 bags are processed monthly. The Ag-Bag composting process takes about nine (9) weeks to produce the composting material. The composted material is placed at the designated Curing Area for the final process for maturing of the compost and turnings for a final hygienisation.

The composting area measures 4 acres (300’ x 600’). The available area was chosen due to its capacity to hold up to 60 bags of processing material which represented nine weeks of composting process handled at the same time and area. The site was prepared with about 3° sloping and a surrounding ditch behind the bags measuring 3’ of width to collect any leaching water. A collection system was created so leaching water and runoff could be led off to a drain. The compost ground was compacted and contains soils of low permeability to protect ground waters. Collected waters and liquids are taken from the collection point to a processing plant inside the racetrack facility.
Composting Program procedures inside the Camarero Racetrack facility consist of the following:

- Once a day, the stable staff and horse keepers place the used bedding in a hay box located in front of each pair of stables facilities.
- Maintenance personnel load the material from the hay boxes to the dumps trucks and deliver it to the composting site.
- Before entering the composting site, the material in the dump trucks is wetted in a shower area and enzymes are deposited to help accelerate the decomposition of the mixture.
- The Dump Truck place the material in a designated area where it is mixed and placed into the Ag-Bag system by the personnel in charge of the administration of the site.
Due to initial problems with the mixture when the composting program was established, a shower area was later designed and incorporated in the procedures. The mixture presented moisture problems due to the high volume of carbon material and the composting period was prolonged more than expected and needed. Therefore, a prior step was incorporated before the material was dumped in the composting site to be processed. The trucks that pick-up the bedding waste at the stables, then pass through an area of showers, wetting the gathered material and adding enzymes to accelerate the decomposition before taking it to the composting area.

The process of collecting waste from the horse beds and placing them in a hay box is the first phase which begins by removing any foreign material. A recent process has been integrated to the process by introducing the collected leachate in the new material using the shower system. This step allows us to save water and minimize the use of enzymes to prepare the mixture before it enters the final process at the compost site. In addition, the Ag Bag system provides an irrigation system of enzymes when pouring the material from the horse beds into the bags. This is to help the adequate decomposition of the horse beds.

Before establishing the composting program, the Camarero Administration studied several systems available at the market. After thorough consultation, Ag-Bag7 system was incorporated into the daily procedures at the facility. The system differs from others that were studied because it provided mobility and a warranty of environmental controls that could affect third parties: the innovative aspect of this system, its controlled aeration system, the encapsulation of the material to be processed, and the enzymes that speed up the composting
process. In addition to this, the system also presented several advantages because it was easily adapted to the available terrain without major economical investment and the mechanism could handled the possible problems presented by odors, leachate, vectors, corrosion and excessive cost of equipment maintenance.

Camarero Racetrack facility is surrounded in the east and west by urban areas. This is why odor control during the process was priority and the first consideration for the successful development of the Compost Center. Since we started the project two years ago, only two complaints were presented due to odors. After the same was addressed, only one complaint was directly caused by the composting center and was taken care successfully. This area was chosen because it is adjacent to a highway on its North and Northwest and East to a mall which is at a considerable distance. It was chosen by the ability to change the ground for the adequate management of run-off waters, odor, and visual impacts.

AERIAL VIEW

The additional advantages of the Ag-Bag7 system that were considered are the following:

1. Stores haylage and high-moisture grain in oxygen-limited, durable plastic bags of up to 500 feet in length and up to 12 feet in diameter.
2. Anaerobic packing is ensured by using machines manufactured specifically for the purpose of filling the bags. Full width feed deflectors, laser cut stripper bars, and full 1-inch teeth ensure even compaction. As the bag is filled, the bagger moves forward.
3. The exterior white layer of Ag-Bag's unique 3-ply construction repels solar heat and keeps contents cooler. The black inner lining keeps out sunlight and preserves valuable nutrients.
4. With UV inhibitors to resist sun damage, each bag is built to last two years under rugged weather conditions.
5. Puts unlimited, low-cost storage capacity.
6. Feed can be removed from the bags, which eliminates spoilage created by poor face management in other storage systems.
7. Presents the user high degree of process control that minimizes many composting concerns such as odor, bio-aerosols, windblown litter, and weather related problems and high operating costs.
8. Leachate is eliminated as this process employs LDPE plastic to contain the composting material.

Turning has historically been the most labor intensive part of the composting process and has to be carried out in order to introduce oxygen to the materials to create the heat necessary to obtain mandatory temperatures. The system provides excellent control of moisture, oxygen supply, and temperature. Free air space is regulated by compaction adjustment on the filling machine. The oxygen supply is replenished by forced aeration thus eliminating the need for manual turning. Temperature and optional oxygen monitors indicate when the airflow requires adjusting. Moisture content is established upon blending the materials. The bags maintain consistent moisture and temperature levels throughout the process while other systems do not. The compost matrix is sufficient in size to maintain heat, even in cold climates.

Site requirements can be as simple as a slope of a few degrees with a gravel or hard-packed surface, although each site will be individually assessed. Asphalt or concrete are not necessary. A 16 amp single phase electricity supply or a generator is required together with a water supply. There are vent valves installed at twelve locations on the Ag Bag®. If temperatures or oxygen levels inside the bags are not optimal, the airflow is adjusted accordingly. Conditions inside the Ag Bag® can be manually controlled and are not affected by climate change. The system provides a cycle time of as little as 8-10 weeks after which the bag is opened, the compost removed and matured. Five composting cycles per year are therefore possible on the same area of land. In addition, with all material contained inside, problems of bird strike and animal scavenging are eliminated. This is a static composting system employing forced aeration through a series of valves. Unlike open windrows, turning of the piles or mixture will not be required, saving time and investment.
2. REGULATORY COMPLIANCE

In-vessel composting was employed since the primary ingredient to be handled came from manure or animal processing waste, therefore had high-nitrogen content where pathogens could cause an issue. Using the in-vessel system would assure the compliance of the EPA requirement of three days at 131 degrees F or higher (Regulation 40 CRF Part 503).

The system was approved and is in compliance with the regulations of local and federal regulatory agencies. The EPA delegated in the JCA (Junta de Calidad Ambiental), local Environmental Quality Board, the regulatory functions of the entire waste management and environmental issues of Puerto Rico. Attached is included letter of approval of the environmental assessment of our project. So far, the site has been visited by staff of the local Environmental Quality Board, Solid Waste Authority of Puerto Rico, and EPA. They have not found or pointed to any breach.

An Environmental Evaluation was presented to the Agricultural Department of Puerto Rico as required by such and the local Environmental Quality Board. The project was endorsed by both agencies as well as by the Solid Waste Authority of Puerto Rico.

An Operational Plan for the composting system was drafted which was adopted by the racetrack personnel and approved both by the Environmental Quality Board and the Department of Agriculture of Puerto Rico.

Site Safety: To comply with local regulations, an 8 ft. high cyclone fence surrounds the entire composting site. Vehicles entering the composting facility must pass through a gate which is kept closed after daylight/working hours. The compost site is operated by one or two operators at all times during the day shift that are responsible of handling and process the material deposited at the receiving area.

Stormwater and Leachate Control System

The facility is surrounded by a ditch or berm which prevents any run-on from entering the site or run-off. Any leachate emanating from the bags, receiving, processing and curing areas will flow to the stormwater collection system. The collected leachate will be transported to the wastewater plant for treatment. The plant was approved by the local Environmental Quality Board following its regulatory requirements and regulations.
Control of Nuisances

Measures have been taken to prevent or minimize noise, windblown material, odors and vector control. The system removes 90% of the complaint of the odor emission that arises during the compost process. It eliminates the same percent of the problem of leachate management generated during the process.

Noise generation is limited to the small 3hp aeration blowers, a shop-sized air compressor, a 15 hp exhaust fan, a loader, dump trucks and only occasional use of a compost turning loader. All equipment used is limited to normal working hours from Monday to Friday. Such equipment does not produce appreciable noise that could cause any nuisance.

Windblown material is controlled in the first phase before the residuals are drop at the receiving area by wetting the dump trucks cargo through a shower system. The application of moisture assures and minimizes the windblown material as well as provides the adequate water to the mixture to accelerate the decomposition process. The site surrounding fence contains plastic panels that aid in controlling any windblown material get out of the premises as well as secures the privacy of the operation.

Odors mitigation management practices are always observed and is supplemented with a perimeter fogging system, as it is needed. With the Ag-Bag system, the used straw bedding from the racetrack is baled or pushed daily into the bags, minimizing and reducing the odor factor at the site.

Vector attraction reduction is achieved by maintaining the aerobic process at a temperature greater than 40°C as requires by EPA/832/R-93/003. The mentioned fence surrounding the area also helps the site prevent invasion of local vectors that could affect the outcome of the final product or the operation itself.
3. PLANNING

Several considerations were taken not only in selecting the proper system to manage the horse bedding residues and facility gardening maintenance waste but the adequate site.

The area was chosen for its ability to properly manage the runoff and visual impact and also by its ease and likely to be modified. The site is located directly next to the water drainage system used to facilitate the connection of the stormwater drainage to it. The area proximity to the stables allows the time involved in gathering and handling of waste to be quicker and more effective.

The advantage of the system chosen is that it gives us the possibility to move it, if necessary, to other parts of the facilities of the 250 acres of the Racetrack without major investment. The AgBag system was chosen due to several factors:

- Controlled compost management.
- Odor management during the compost process.
- Leachate control.
- Aeration and moisture control.
- Economical material management.
- Save space and reuse part of the aeration system.
- Movement versatility of the center.
- The elimination of a central area for the use of Tipping Floor and, therefore, the maintenance cost.
- Elimination of costs associated with structures such as roofs, floor management, among others.
- Control of vector management.
- Cost effective in general.
4. PERFORMANCE, ECONOMIC AND COST EFFECTIVENESS

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Operating costs for the site has been made possible by the major cost savings provided by the compost system, even if locally the cost of fuel increased. The daily operating costs lie at around $780 and savings from solid waste disposition are around $3,300, including additional savings and human resources management and use of infrastructure of $2,520 per day.

The costs of managing solid waste through a composting system vary in Puerto Rico at a rate of $980 a day, so the Camarero system operates below the cost of other local facilities. Thanks to the implementation of this system and the savings that has occurred, the administration of the Racetrack Camarero could handle the financial crisis that has impacted us locally in the last 18 months and that has also affected the global economy. The investment in such project was made mainly in equipment such as the following: 2 loaders, 1 excavator, 3 dump trucks, 1 C-10 Ag Bag System, 29 blowers, Ag Bags (12 bags are approximately used monthly), 24 HDPE tubes 6”, 1 shower system.
5. WORKER HEALTH & SAFETY

In addition to the Operational Manual that was drafted and presented to all employees, Camarero Administration has conducted two training of personnel handling the equipment and composting system. Also, health and safety training was provided to all employees. The trainings will be handled annually. Additional training will be scheduled to be provided whenever an employee changes job functions or there is a change in machinery or equipment.

Additionally, a full inspection of each piece of equipment will be done at least twice per year. Repairs to any problems noted with either the facility or specific parts of the equipment are completed as soon as possible to minimize downtime and to ensure utmost safety and site efficiency.

As required by OSHA, the staff has the necessary safety equipment for work inside the compost and in the stables. All personnel have to use the protective equipment when operating at the site or the pick-up system. Safety glasses with side shields are provided to avoid splashed liquids and avoid hazards from flying particles. Safety shoes must be worn in order to avoid foot injuries by objects piercing the sole and to facilitate the steps in the terrain. Also, gloves are worn at all times to avoid exposure to harmful substances and pathogens.

Another safety rule involved at the site is the use of reflective vests worn by employees at high vehicle traffic such as the stables, hay boxes and unloading area to enhance their visibility.

Employees working at the pick-up area of hay boxes and unloading material are equipped with facial masks to avoid direct exposure to material odor or contaminants and to limit inhaling of dust and other particles.

All permanent site employees must have up-to-date immunizations against Hepatitis B and Tetanus.

Adequate fire extinguishers had been placed on all mobile equipment in order to help contain and control of any spontaneous fire that may occur (not probable, but security has been attended). Other security measures that are observed are:

- Only authorized personnel are permitted at the premises.
- All visitors to the facility must first report to the Administration Office.
- All visitors must wear appropriate safety equipment such as footwear and safety glasses.
- Gates will be maintained on all access to the site to prevent unauthorized access.
- There will be a regular check of the facility to inspect perimeter security fence, stormwater ditch, possible vectors, equipment or any other defect that must be reported and that will affect the operation.
6. PUBLIC ACCEPTANCE, APPERANCE AND AESTHETICS

The composting site is located far away from the racetrack building and the horse racing arena. The visibility to the site is slightly impossible even from the upper seating area at the main building. But if any, the public will be only be able to observe long “worm type” of lines at the distance near the end of the stables.

The visitors and tenants at the stable area also don’t have any visibility to the composting site since it is bordered by a green plastic panel fence 8 to 14’ in high.

The site is maintained in optimum conditions and order with a gardening maintenance schedule that keeps weeds and other vegetation from growing. The bags are placed in lines separated by 5 feet and regular inspection is done to maintain any grass or weed growing between them.

Since the site has been operating for a year, and different changes were still taking placed regarding the appropriate procedures, our effort were concentrated in the success of this project. The Camarero Administration had the primary objective to reduce the waste disposal cost as well the landscaping and gardening maintenance. Once it has been accomplished, Camarero will facilitate the local universities and community colleges as well as school with a study-site for their student population and encourage other local institutions to employ a composting project in order to reduce the waste volume that is deposited in our few local landfills.
GENERAL COMMENTS

The Camarero Racetrack Composting Site is the first being established in the island outside a landfill and in a private sector.

If the compost project were not established, the Camarero Administration Operational cash flow would have been affected. The prior company that maintained the racetrack franchise formerly to Camarero had its own landfill. Per losing the franchise to Camarero, they closed the sanitary facilities. Camarero Administration was obligated to pay for the disposal of its solid waste to a commercial landfill creating a financial burden in the operation.

Mortality in horses is about 4 species per week at a disposal cost of $2,000, which results in $104,000 per year. In the second phase of this compost project, dead horses will be handled in special bags designated for that purpose. At the same time, Camarero is investing in a shredder to handle them.

Up to this point, the composting project has achieved the following:

- 110,000 yards; saved at the local landfill,
- $2,600,000 saved in disposal costs,
- 36,200 gallons of diesel,
- 32,850 yds; of compost material that has been used in the racetrack landscaping.
- The employment of five workers was retained.
- The first composting project of horse bedding was established in the Caribbean and the first using the Ag-Bag system.
- Created a mechanism in Puerto Rico to address the 1,989 stables that houses more than 10 horses in each (stable). Currently, these stalls dispose of their waste in landfills, green areas adjacent to them, on slopes of rivers, among others. This system may be used as an alternative that is economically viable and environmentally safe.
- Up to date direct development cost are $460,000. This cost includes the initial acquisition of equipment, construction, maintenance, labor, permits and consulting costs.

When the design of the proposed compost site was presented to the Camarero Administration in March 2007, the following priorities wanted to address:

- Adequate diversion and reuse of waste gathered from the bed stables through a composting project.
- That the cost of the investment and management was minimal,
- That the project were environmentally safe
- Create a new opportunity in the local industry that was non-existent,
- To serve as a pilot program to manage the daily horse bedding waste in Puerto Rico, (which is approximately 19,835 cubic yds daily)
- The creation of new jobs or to preserve them by retraining old personnel.
- Create a resource center for local universities for research and development.
• To meet the estimated savings provision of 50%. (We have exceeded the saving to 82%)
• To accomplished a work with no adverse impacts to third parties.
• The development of other environmental conservation projects such as recycling, green building and the creation of a biogas plans in future at the racetrack.
ENVIRONMENTAL DOCUMENT
LETTER OF APPROVAL
CAMARERO COMPOST CENTER
DEPARTMENT OF AGRICULTURE
JUNTA DE CALIDAD AMBIENTAL
(ENVIRONMENTAL QUALITY BOARD OF PR)
LETTER OF APPROVAL
CAMARERO COMPOST CENTER
CAMARERO RACE TRACK CORP.
NOVEMBER 2008 INVOICE
SOLID WASTE DISPOSAL