

BIOCYCLE

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**HURRICANE
DEBRIS
MANAGEMENT
INSIGHTS**

**ELECTRICITY
FROM METHANE
IN IOWA**

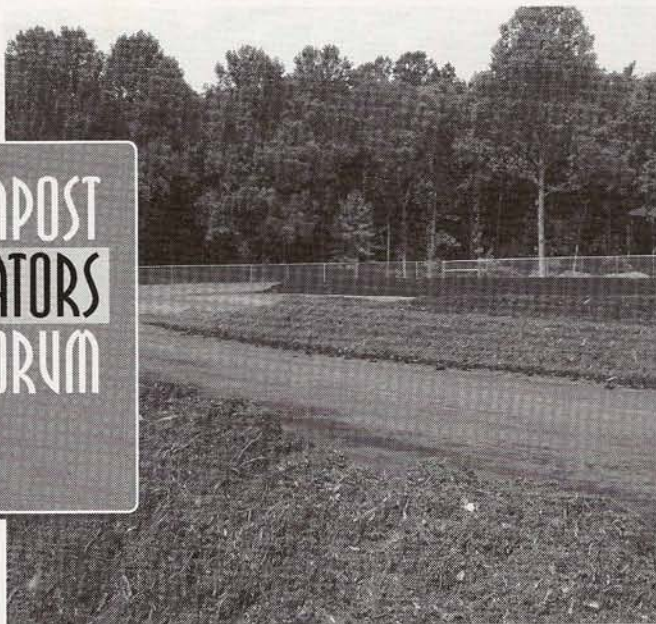
A TALE OF **COMPOSTING FACILITY START-UPS**

**SIMPLE
DIGESTERS
FOR SMALLER
DAIRIES**

**ADDING FOOD
TO YARD TRIMMINGS
SETOUTS**

**COMPOST BOOSTS
VEGETABLE YIELDS**





The 2.5 acre North Londonderry Township, Pennsylvania composting site (left) was sized to process yard trimmings "for the next two years," while the West Wendover, Nevada windrows (right) were set up as a good alternative to building a high-cost landfill.

Tale of Two Composting Start-Ups

Yard trimmings facility in Pennsylvania and food-rich feedstock composting site in Nevada illustrate two approaches to getting a composting facility up and running.

PLANNING ahead is probably the best way to sum up the approach taken by officials in North Londonderry Township in central Pennsylvania when they designed their 2.5-acre yard trimmings composting site that opened in the spring of 2005. The facility was sized to handle the flow of leaves, grass and brush expected in a few years, as newly planted lawns and trees in this rapidly growing township mature. "The biggest lesson we learned as we toured other yard trimmings composting sites in our area was to build the capacity we would need in the future," says Earl Blaich, Roadmaster for the township. "A number of the sites we toured didn't have enough space to process the volumes

they were receiving."

Across the country, in West Wendover, Nevada, finding an alternative to building a high-cost landfill in a small rural community was the driving factor to this city getting its composting feet wet. With a limited budget and an urgent need, Tom Stratton, then Public Works Director, purchased some used equipment, worked with a local fabricator to make the trommel screens and took the plunge.

Landspreading To Composting

North Londonderry Township initiated curbside collection of leaves in 1989. Fall leaves were collected with a vacuum truck and stockpiled. Area farms were willing to take the leaves. At the end of the

season, the township rented two manure spreaders and two tractors and in a day's time, the leaves were land applied and plowed into the soil. When the farms were required to establish nutrient management plans, nutrients from leaf application needed to be factored in. "Farms became less willing to take the leaves," says Don Heverling, Assistant Township Manager. "Combined with land development pressures, it made sense for us to establish a composting site."

To fund the project, the township took advantage of a grant program established by the Pennsylvania Department of Environmental Protection. The funds are accrued from a surcharge on landfilling fees. The first grant application, submitted in June 2003, requested about \$400,000 to finance site development. A second grant application, filed in 2004, funded a new leaf collection truck with a multipurpose chassis, the windrow turner, and fencing for the site. "We are planning to issue annual permits to residents to use the site to drop off grass clippings, garden residue and leaves," says Heverling. "Fencing in the site, and installing an electronic

gate access system will facilitate the process. Residents will pay \$25/year for the permit and can use the site at their convenience. Currently, without the permit system in place, they can only drop yard trimmings off between 8:00 am and 3:00 pm, Monday through Friday." No loads from landscapers or other commercial entities are accepted at the site.

Among the lessons learned from touring other composting operations was to design a rectangular pad to accommodate the long, narrow windrows. "If we put in a square pad, we would be losing efficiency," says Blauch. "We also needed enough room to receive leaves in the fall and be composting at the same time." Placement of the pad on the site to manage storm water runoff was another consideration. Adequate room was allowed for storm water detention and filtration using swales and nearby woods as a buffer to any stream system. The pad has about a four percent slope, with sheet flow to one end.

It was decided to pave the composting pad both to enable year-round access, and to maximize the efficiency of the windrow turning equipment. Bare ground adds a lot of differential, affecting the torque

of the machine. The level asphalt surface improves operating efficiency, and eliminates potential for ponding of leachate in ruts, a potential odor source.

A dropoff area inside the fence but near the entrance to the site was established for residents. Concrete barriers create separate "bins" by feedstock type, e.g., grass clippings, leaves, garden residue, etc. No materials are accepted in containers or plastic bags (residents can empty containers or bags into the specific bins). The township owns two Morbark chippers and two trucks to blow the chips into, which it procured in 1995 when a curbside brush chipping program was initiated. The woodchips collected from the curbside chipping program are incorporated into the compost windrows. In 2004, the township chipped about 130 tons of brush. "Lebanon County has a tub grinder at its landfill, so anything we can't handle with the chipper gets taken there," says Blauch. Residents can take larger tree limbs and wood to the county site as well.

Equipment Investments

In 2004, the township collected about 150 tons of leaves, an amount

that is expected to increase as the young foliage grows. Leaves are collected using an ODB (Old Dominion Brush) vacuum that has a blade in it to size reduce the leaves and maximize the amount that can be collected on each route. The township purchased a custom-designed truck chassis, fabricated by Pikrite in Lewisburg, Pennsylvania. The hook-lift design enables a rapid change-out of equipment, e.g., interchanging the leaf vacuum unit with the dump box. Leaf collection can be done by one person, as the truck has both left and right side steering and the driver has controls to manipulate the vacuum hose. The leaf collection unit has a rear mounted camera so the operator has full visibility behind the unit. "We also have an 1,800 gallon watering unit with a spray boom that can be mounted on the truck chassis, which enables us to spray the windrows as needed to adjust moisture levels," says Blauch.

When it came to selecting windrow turning equipment, the township evaluated both tow behind and front-end loader mounted units. Ultimately, a Brown Bear self-contained 3610 loader attachment, powered by a Cummins engine, was purchased from the local Brown



At the Pennsylvania site, the Township purchased a truck chassis with a hook-lift design for interchanging the leaf vacuum with the dump box (far left, left). Windrow turner (below) can place piles edge to edge after each pass.

Bear dealer, Cleveland Brothers Equipment. It is designed to turn windrows that are 3- to 3.5 feet tall. "With yard trimmings, this model has a productivity rate of 1,200 tons/hour," notes Phil Brown of Brown Bear. "It is designed to displace the windrow 8- to 10-feet after each turning, so that piles can be placed edge to edge. The unit purchased by North Londonderry Township can process at least four to five times the amount of material currently being processed." Cost of the unit was about \$80,000.

The first batch of compost was screened with a trommel rented from the county landfill. Residents are now able to purchase the plant bedding material for \$10/loader bucket.

It also is available in smaller quantities if requested. Initial response to the quality of the material has been very favorable. Springtime should see the entire stockpile depleted in a relatively short time as more residents become familiar with the product and realize its beneficial qualities.

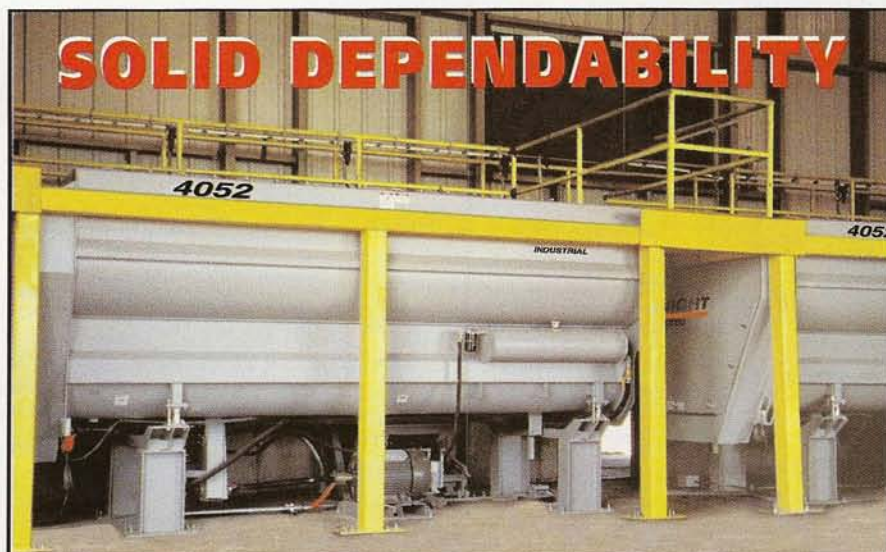
Avoiding A Class 1 Landfill

West Wendover, Nevada is a small



community of less than 5,000 residents at the Nevada and Utah border. The city found itself turning to composting as an alternative to building a Class I landfill, an undertaking that would have resulted in an estimated \$1 million in capital and operating costs. "Because we are a small rural town in northeastern Nevada relying on gaming, we do not have the financial resources that other communities in Nevada — namely Las Vegas or Reno — may have," says Tom Stratton, who until recently, was the Public Works Director for West Wendover. "Our composting plant was built solely on money from the U.S. Department of Agriculture and the general fund available to the Public Works Department."

Overall MSW generation is about 35 tons/day. West Wendover has 2,000 hotel rooms and five casinos plus other support businesses. The composting facility has a throughput of roughly 10 tons/day, consisting mostly of food residuals and other solid waste, and biosolids. Due to the limited amount of funding, Stratton was somewhat entrepreneurial in the facility design and equipment selection. A building houses biosolids dewatering beds, two rotating mixing vessels (which the city purchased used), a trommel



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The composting plant in Nevada processes 10 tpd, with steps that include an MSW tipping floor (top), loading end for mixing vessels (center), and the final finishing building (bottom).



screen and an aeration bed for active composting. Food-rich MSW loads, along with biosolids at 30 percent solids, are loaded into the mixing vessels. Segregated loads of wet or waxed corrugated are put directly into the vessels with no grinding.

After a retention time of 48 hours, material is conveyed from the vessels into a trommel screen with 1-1/4-inch holes. The overs are land-filled; the screened material is placed on the aeration bed. "The piles are turned every seven days, rotating from one end of the bed to the other," explains Stratton. "Each pile stays on the aeration beds for 28 days total."

After the 28 days, compost is moved to an open-sided finishing building. Compost is screened in a trommel with one-quarter-inch holes. "Be-

cause of the large amount of liquid refreshment served in Nevada, we have had a very hard battle removing glass from our compost since most of the MSW is generated by the casinos," he adds. The problem was addressed with the purchase of a destoner made by Forsberg, Inc., in Thief River Falls, Minnesota.

Finished compost is used on large landscape projects in and around the city. "Use of the compost has worked very well in growing both grass and trees which saves on large consumption of water," says Stratton. "The wastewater treatment plant at this facility also supplies 1.5 million gallons per day of treatment plant effluent water to the golf courses."

Looking back at the decision to proceed with composting instead of a landfill, he concludes: "The food residuals are what make composting such a neat project and they decompose better than anything else. Living in the desert along the Bonneville Salt Flats, we have very little green waste to compost. Our operation has saved our small community a tremendous amount of money by not having to open a Class I landfill. And it provides an excellent soil amendment that saves water." — N.G. ■