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Mixed Waste Composting Facilities Review

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Managers of 11 facilities recovering organics and other material out of unsorted waste discuss challenges and triumphs in 2010.

Dan Sullivan

RECOVERING organics and other recyclables from a mixed waste stream is practiced by only a handful of facilities across the nation, most of which have special circumstances, such as seasonal tourism. BioCycle has been tracking mixed waste composting facilities in the U.S. for two decades. Eleven plants are operating at this time, utilizing a variety of separation and composting methods. Some cocompost with biosolids and a few are seeing an increase in the loads of source separated organic streams that can go directly into the active composting system.

One facility, West Wendover, Nevada, shuttered its operation since BioCycle's 2009 survey. And while no new mixed municipal solid waste composting facilities appear to be on the drawing board, the 11 operating plants in nine states report significant activity with regard to innovation — all striving for increased recovery of organics and recyclables.

GILROY, CALIFORNIA

Z-Best Composting Facility reports processing about 400 tons/day of MSW for the first three quarters of 2010, up significantly from the 300 tons/day reported in 2009. "Most of what's really driving the tonnage increase is the inclusion of multifamily materials from the City of San Jose," explains Michael Gross, marketing manager for Z-Best parent company Zanker Road Resource Management, Ltd. This new waste stream began coming into a sister facility — Green Waste Material Recovery Facility (see "Whole System Organics Recovery," November 2009) — about 15 months ago. Gross explains, the bulk of which is reflected in the first nine months of activity for 2010. The Z-Best plant in Gilroy composts the material in aerated static piles enclosed in CTI bags.

Z-Best's recovery rate is about 85 percent. "The biggest challenge to increasing diversion is trying to deal with film plastics and other waste products," he says. The company has partnered with GreenWaste Recovery to bid on a request for proposal from the City of San Jose, which would provide 150,000 tons of organic materials for a planned anaerobic digester to process the organics for energy before composting them. "We're ready to go," Gross adds. While keeping the incoming organics stream as clean as possible continues to present challenges to Z-Best, educational outreach to collection companies — particularly with regard to handling yard and food waste — has been successful. Because a large percentage of Z-Best's compost customers are Salinas and Monterey Valley's organic farmers who must operate within the parameters of the USDA National Organic Program (NOP) — and the confines of the Organic Materials Review Institute (OMRI) — Gross says it's critical to the bottom line that feedstocks are trackable and kept separate as these growers only want green waste compost. "Food scraps are not OMRI approved," he explains, adding that these materials often have PLA (a compostable resin), colored paper and waxed cardboard mixed in with them, ingredients about which OMRI and the NOP remain ambiguous, at best. "Our markets are very important to us. Farmers know what they want, and they're not going to take any kind of risk, so we're taking a very conservative approach, and we're very selective in what we do. We move about 130,000 tons a year, with most of it going into agriculture."

MARIPOSA, CALIFORNIA

When BioCycle last spoke to the Mariposa County Landfill, Compost Facility and Recycling Center, it had recently hired a consultant to help maximize efficiencies. Recommendations included moving the location of the bag ripper to the head of the sorting line. "It seems like such an obvious thing — but we don't have any money at this point to follow through on any of the recommendations," explains Solid Waste and Recycling Manager Michelle Miller. "We've been trying different techniques to get a better end product and also get more recyclables out." With only 18,000 people in the entire county, there is no curbside pickup or mandatory recycling. Therefore residents have to source separate and bring their materials to drop-off sites at the landfill or one of the transfer stations. "That discourages people from recycling," says Miller. "We have CRVs (California Refund Value deposits), and we're doing education. But people somehow processed misinformation when this facility was set up, thinking we were going to recycle for them." As a dirty MRF, some recyclables are recovered, but likely not the quantity or quality compared to being sorted at the source.

While the year-round population of the county may be sparse, the Mariposa facility also services some 3.8 million seasonal visitors annually to nearby Yosemite National Park. "That

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puts quite a tax on our facility," says Miller. "We go from 30 or 40 tons a day in the winter to 100 tons a day in the summer. In the winter, we try to do more processing than we are able to in the summer when there are always staffing issues." When the \$8.2 million facility was built — mostly funded with USDA subsidized loans — the park contributed \$1.2 million in loans. Miller is working with Yosemite's concessionaire, Delaware North Corporation, on a food waste recycling program that includes compostable serviceware. She'd like to expand the program to area restaurants, local schools and a nearby detention center with the cooperation of the local trash hauler, Total Waste Systems. "It's working really well," she says, adding that there is still a wide margin for improvement. "It would be nice to get more food waste coming in; we could process that more easily than picking through garbage." The facility utilizes the SV Composter vessels manufactured by Engineered Compost Systems (ECS).

The county also has targeted clothing and Christmas lights for recycling, two items that tend to wreak havoc by getting tangled in the processing machinery. "And film plastic is really a problem," she says. "We can't seem to get it out of our system enough to make compost that really looks like compost."

MARLBOROUGH, MASSACHUSETTS

"We are seeing a lot less contamination, and we're starting to receive a lot more food waste," says Marlborough composting facility manager Phil McCarthy. "It's becoming a much bigger part of our business. There is also much less contamination. Everyone seems to be getting on board — especially supermarkets." McCarthy attributes that growth to diversion programs spearheaded by the Massachusetts Department of Environmental Protection, adding that the Marlborough facility — managed by his employer WeCare Environmental, LLC, probably takes in the bulk of that diverted organic waste stream. "We haven't increased any biosolids intake at all," says McCarthy. "We continue to process at about a 22 to 25 percent amount of biosolids to solid waste. Our permitted capacity is roughly 150 tons/day, and our food waste business is probably half of that."

Overall waste volumes are down somewhat, predictably in line with a sluggish economy, and probably will be for another year or so. "We are operating at roughly 2,700 to 3,000 tons/month processed right now, approximately 8 to 10 percent less than the year prior," McCarthy says, adding that about 90 percent of what comes into the facility has already undergone some level of presorting and that the recovery rate is between 60 and 70 percent, depending on time of year and cleanliness of the load. "We also take in the city of Marlborough residential solid waste as part of our contract. Every day is a new challenge, in a lot of ways. We're operating at a 13-year old plant, and we have to keep figuring out how to expand our markets in a down economy." The Marlborough plant utilizes a rotary drum for initial processing, followed by aerated windrow composting inside a building.

NANTUCKET, MASSACHUSETTS

When BioCycle spoke to Waste Options, Inc., in 2009, it was considering installing a bag breaker and setting up a picking line to remove more plastic at the Nantucket composting facility, while at the same time hoping island businesses and residents would commit to using compostable bags. "There's been no real progress with either one of those," says Nelson Widell, a partner in Waste Options, which manages the composting facility and landfill. "There's been resistance to the cost of biodegradable bags from hotels and others." Additionally, he says, compostable bags are not a good fit for the Bedminster rotary drum system, used in the first phase of Nantucket's composting process, because the bags end up in the overs stream that goes to the landfill. During the summer season, the facility processes about 80 tons/day of MSW. After the drum, material is composted in aerated static piles inside a fabric structure.

All of the compost — except for what is given away to residents — is sold on Nantucket Island. The biggest news currently is the success of a multiyear project that is mining the Island's old unlined landfill, estimated to contain 1.5 million cubic yards of material. (A smaller, lined landfill receives residuals from the composting facility as well as what can't be recovered from the old landfill.) To date, 125,000 cubic yards have been mined. "Seventy percent of what has been mined is useable structural fill and recyclable metals," says Widell. "They are in the process of mining the whole landfill. Every 1,000 cubic yards are tested, and the material is certified for reuse."

Widell acknowledges that Nantucket's reclamation project has decided advantages over other facilities. "The landfill in Nantucket, for the most part, has only ever taken in clean residential material," he says. "There never has been any industry or toxic waste, although we did, 10 years ago, find a cache of unexploded ordnance from World War II." The structural fill is utilized on the island, while the recovered scrap metal gets exported elsewhere.

TRUMAN, MINNESOTA

Like many of the mixed waste composting sites we interviewed for this update, the economy has taken its toll on the Prairieland Compost Facility in Truman. "When you talk to most solid waste managers, everyone is down between 5 and 8 percent from 2008," says Prairieland's director Mark Bauman, "and that's kind of where we're at." Bauman says he's beginning to notice "a slowdown in the slowdown" but that the volume of materials processed hasn't quite gotten back up to the 65 tons/day of throughput reported in 2009. He's also hoping a contract for refuse derived fuel (RDF) will bolster the facility's revenue stream. "If we get the RDF contract we may do some equipment changes, but not this year." The current recovery rate is about 65 percent organics, with the remainder — mostly plastic with other noncompostables — trucked to a landfill 40 miles away. "I think we could get to between 80 and 90 percent resource recovery if we can get that RDF contract," Bauman says.

Overall, the composting facility — which utilizes the OTVD agitated bay technology — continues to compete with low priced disposal. "We've been open for more than 19 years, and those low-priced landfills have always been a challenge," he notes. "In 1997, Prairieland set up contracts with haulers for collecting waste across two counties. The facility lowered its tipping fee, which it made up for by collecting hauler service fees and also by charging haulers if they went out of county with their loads. "It was kind of a double incentive to bring it in," he explains. Now and despite cheaper tip fees at landfills, Bauman says some businesses are willing to pay a premium to be green. "We do get some of those companies that call us up

and say they want to keep their waste out of the landfill," he adds.

WEST YELLOWSTONE, MONTANA

Throughput at the mixed waste composting facility in West Yellowstone has been on the rise. "We're up close to 5 percent from last year on the volume of trash coming through," says John Burns, facility manager. "With this economy more people — rather than taking extended vacations to Mexico or Europe or Hawaii — are loading up their car and coming to Yellowstone. Last year set a record, and this year has been even better. And more people means more trash." The Yellowstone facility processed 2,326 tons of mixed waste in 2009 and was already at more than 2,400 tons by late October 2010. "The park closes November 7, and then the waste stream slows down to practically nothing," he adds. From then until late spring, it's mostly screening and maintenance. West Yellowstone also has a diversion program for construction lumber, any other clean wood and roofing shingles. It is stockpiled, then processed by a contract grinder about every 18 months. The facility utilizes SV Composter vessels (ECS) for the first stage of composting, followed by curing in aerated static piles. "We're probably at 40 to 45 percent recovery," says Burns. The landfill, located in Logan, Montana, is about 125 miles from the plant.

While the park doesn't ask visitors to presort organics, park employees endeavor to put compostables in clear bags and noncompostables in blue bags. The clear bags go into the wet mill, where cutting edges rip open the content. The compostables are mixed with wood chips, water and horse manure in a four auger mixer. An experiment with processing biosolids was tried and abandoned about five years ago because of incompatibility with the equipment. "The biosolids were too heavy and too dense, and we had some troubles with the conveyors," Burns recalls. The facility typically reaches capacity around mid-August, he adds, then has a hard time keeping up with screening all that's produced until the action tapers off in winter. New to the operation is around 1,000 pounds/week of source separated organics coming from one of the hotels in town. "It bypasses the wet mill and tipping floor and gets put right into the composting process," he says.

While the park has a progressive recycling program, some glass, aluminum and other recyclables still find their way to the composting facility. "We're always striving for a cleaner waste stream, which makes our process more efficient, makes for a better product and means less time screening," explains Burns. "Working with park employees has been helpful. They are progressive with their programs. They come here for a visit to see how we operate. It's a plus being able to work with those guys so closely."

With winter temperatures sometimes dipping to 40 below, all operations — tipping floor, curing floor, composting vessels and screen room — are housed in one building. That not only adds to overhead, including a \$30,000 winter heating bill, it creates some special problems. "Hikers buy cans of bear spray — cayenne pepper under pressure — and can't take them on the plane or don't want to drive back home with them, so they throw them in the trash can," he says. "It gets in the wet mills and the pop tops off and it takes awhile for the building to clear out!" Thankfully, Burns adds, the park has started encouraging recycling of the bear spray cans with special receptacles to collect and keep them out of the waste stream.

DELAWARE COUNTY, NEW YORK

Delaware County Department of Public Works Solid Waste Director Susan McIntyre reports no new capital projects or infrastructure investments for 2010 but says decisions last year to repair a crack in a rotating drum, switch from grease to graphite for lubrication of that drum (and related easier maintenance) and to purchase a second Siemens-IPS agitator for backup all have proven to be sound strategies. In terms of throughput, the current economy has brought with it a decline in volume of about 5 to 10 percent (last year the facility reported a throughput of 24,000 tons of MSW and 7,000 tons of biosolids).

While McIntyre would like to add more source separated organics to the facility's waste stream, there hasn't been much activity in that regard outside of the public works department's service area. "It's not for lack of interest on our part ... Transportation issues and the geographical location of where we are has hampered us."

The composting facility recently entered into a partnership to help eradicate invasive plant species. "We were approached last year by one of the soil and water conservation districts to help with knotweed, an invasive, highly opportunistic plant that gets into stream banks and overtakes native vegetation," McIntyre explains. With help from a local college, a program was established to see if the plants could be neutralized through composting. "It's more than just killing the weed seed, it's the actual plant rhizome — they regenerate through suckering," she adds. Through controlled experiments, the research found that the plants could be thoroughly destroyed within just a few days. Once that was verified, the Delaware County composting facility decided to take on the project. "One of the benefits of our compost that we regularly advertise is the fact that it's weed free and we can verify that," says McIntyre, attributing the ability to make that claim to consistently high temperatures.

Incoming MSW is processed in a Conporec bioreactor rotating drum, mixed with biosolids and composted in a Siemens-IPS agitated bay system. Compost is marketed under an agreement with WeCare Organics, LLC, based in Jordan, New York (see "Marketing Mixed Waste Compost," November 2009). "By volume, which to us is the more important standard, we have a 70 percent recovery rate," says McIntyre. "I see a real tremendous opportunity to provide disposal capacity for the community and [to process] industrial organics — the high BOD waste streams that wastewater treatment plants struggle with. That's where we view our biggest growth opportunity. The challenge is to control operating costs and ensure quality of the finished product. There's nothing new in those challenges. They are longstanding."

MEDINA, OHIO

Medina County operates a Class 1 and a Class 4 composting site, the latter processing about 25,000 cubic yards a year — or 12,000 to 13,000 tons of yard trimmings. The Class 1 site composts the organic fraction from a mixed waste stream at the Medina County Solid Waste Central Processing Facility (SWCPF), which receives more than 500 tons/day of MSW. "The central processing facility is for regular recyclables — cans, plastic, fiber, wood, aluminum," says William Strazinsky, solid waste district coordinator. "Loads that come in here that don't have any recycling value are just transferred." After sorting for recyclables, remaining material goes through a trommel screen with 2-inch holes. An air classifier blows out lightweight plastic

before the MSW enters the composting plant. "Our recycling rate in the county is about 48 to 50 percent every year of all solid waste generated," adds Strazinsky. "We have no active landfills in Medina County. The landfill that's using our finished material for cover is in Richland County about 45 minutes away."

More organic material is being recovered out of the MSW stream for composting due to physical modifications to — as well as increasing the rotation speed of — the trommel screen drum. Through the first nine months of 2010, the SWCPF processed 96,178 tons of material. "We're up about 3 percent over last year," Strazinsky says.

RAPID CITY, SOUTH DAKOTA

On par with previous years, the composting facility in Rapid City receives about 180 tons of MSW and 60 tons — or 12,000 gallons — of liquid biosolids per day. Materials are mixed in two Dano drums and composted for four weeks in nine Siemens-IPS agitated bays. "The biosolids go into the Dano drums along with the organic fraction of garbage," explains MRF Supervisor Mike Oyler. "The drums are working well. We are getting a good homogeneous mix, and we're producing about 40 to 60 tons of compost a day." The compost is utilized for public works projects and by contractors for new construction sites as well as by home gardeners. Capital construction projects at the plant include rebuilding a conveyor and installing a new concrete floor. As for an arrangement struck last year with Gillette, Wyoming, to accept that community's commingled recyclables for processing in exchange for MSW compost, Oyler says: "They're bringing us 8 to 10 tons of recyclables every two weeks — and taking back a semi load of compost for reclamation work in their landfill." Recovery at the Rapid City facility is around 50 percent.

SEVIERVILLE, TENNESSEE

The mixed waste cocomposting facility operated by Sevier Solid Waste, Inc., processes 275 tons/day of MSW and 60 wet tons/day of biosolids. The article on page 21, "Tennessee Composting Facility Makes Full Recovery" in this year's MSW Composting Update profiles the Sevierville plant.

COLUMBIA COUNTY, WISCONSIN

"The only thing we've done differently [over 2009] is install a compactor so we can ship out commingled recyclables," says Bill Casey, director of the Columbia County Recycling and Waste Processing Facility. "They get packed into a semi and go to a plant in Watertown, where they have the machinery to separate them."

The composting facility, adjacent to the local landfill, processes MSW in two 250-ton capacity rotating drums for five days, after which the material is screened and composted in windrows for eight weeks. Columbia County monitors groundwater as well as takes leachate samples from the compost pads. Residuals are compacted and landfilled. Compost, about 3,000 tons a year, is given away to landscapers and farmers. "We also make a leaf compost that is sold to residents — it's not processed in the drums and not regulated by the DNR, so we can sell that," explains Casey. "We also give away wood chips." He estimates the recovery rate at the facility is 50 percent.

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