



Lee County, Florida — windrow composting inside fabric structures.

BIOCYCLE NATIONWIDE SURVEY

BIOSOLIDS COMPOSTING IN THE UNITED STATES — 2010 UPDATE

BioCycle and the North East Biosolids & Residuals Association joined forces to update the list of biosolids composting facilities around the country, identifying a total of 265 projects.

Part I

Ned Beecher and Nora Goldstein

BIOCYCLE first published a survey report on biosolids composting in the United States in 1983. Twenty-seven years ago, the survey identified a total of 61 “full-time” projects, with another 29 expected to begin within a year. The national survey skipped a year and was conducted again in 1985, and then annually through 1998 (see “Biosolids Composting In The United States,” January 1999). By that point, there were 321 projects in the U.S., with 274 operating facilities.

In May of this year, following an inquiry about the number of biosolids composting

operations in the U.S. — and not being able to provide an accurate estimate — we decided to conduct the nationwide survey once again. The process took a number of months, but the results are encouraging. *BioCycle’s* 16th Nationwide Survey, done in collaboration with the North East Biosolids & Residuals Association (NEBRA), identified a total of 265 biosolids composting projects in the United States, with a total of 258 in operation.

Table 1 summarizes the composting methods utilized at the operating biosolids composting facilities. Similar to the 1998 data, the most utilized composting method

Table 1. Summary of composting methods utilized by U.S. projects

System Type	
Aerated static pile	108
Windrow	83
In-vessel	46
Aerated windrow ¹	8
Static pile	4
Enclosed aerated static pile ²	4
Vermicomposting	1
Not specified ³	9
Total projects	265

¹Windrow on in-slab aeration system. ²Engineered tarp enclosure with aeration. ³Unable to confirm composting method utilized.

Guide To Table 2

COMPOSTING METHODS:

ASP=Aerated static pile; AW=Aerated windrow; Enc. ASP=Covered, aerated pile (using proprietary technology); MASP=Modified aerobic static pile (combining AW and static pile) that utilizes a catalyst

VENDORS CITED:

Mixers: Kuhn-Knight; Luck Now; Roto-Mix; Supreme International

Windrow Turners: Backhus; KW (Resource Recovery International); Scarab; Wildcat

In-Vessel – Agitated Bay: CSC Paygro; Siemens International Process Systems; Trans-form

In-Vessel – Tunnels: Engineered Compost Systems (ECS); Gicom; Green Mountain Technologies; Waste Solutions (WS)

Enclosed ASP: ECS; GORE Cover; Managed Organic Recycling (MOR)

Other: Bedminster (Rotary drum); American Bio Tech (ABT) and Purac (vertical silo)

is aerated static pile (total of 108), followed by windrow composting (83). There are 46 facilities using in-vessel systems, with the remainder employing aerated windrows (windrows built on a floor with aeration trenches), static piles, enclosed aerated static piles (engineered technology using tarps and forced aeration) or vermicomposting. And interestingly, the number of projects in construction is almost identical (6 in 1998 and 5 in 2010).

The primary difference between the 1998 and 2010 data is the number of projects in development (permitting, design/bidding, planning, consideration and pilot). In 1998, *BioCycle* found a total of 47 projects in development. In 2010, only one project is in planning and there is one pilot. The difference could be attributed in large part to the 12-year gap in data gathering. Conducting a survey annually creates the ability to track projects through the various stages of development. It also provides an opportunity to create a fairly extensive network of contacts within the biosolids composting community — state agencies, municipal governments and consulting engineers, as well as individual project managers.

In 2010, *BioCycle* and NEBRA focused initially at the state agency level, contacting state biosolids coordinators and asking them to review the list of biosolids composting projects identified in their state in 1998. Most states were able to update the listings, noting facilities still in operation, those no longer operating and any new projects. In almost every case, data was only provided on operating facilities versus projects in development. We also contacted projects directly to confirm and elaborate on the information we had. Assistance also was provided by the U.S. EPA regional biosolids coordinators. Fi-

Table 2. 2010 BioCycle/NEBRA survey of U.S. biosolids composting projects

State/Location	Status/Operator	Biosolids Quantity (dry tons/yr)	Composting Method
ALASKA			
Fairbanks	Operational (Golden Heart Utilities)	1,525	ASP
ARIZONA			
Apache Junction:	Operational		Windrow
Superstition Mountain CFD			
Pinetop-Lakeside	Operational		In-vessel (Bedminster); AW
Vicksburg	Operational (Synagro Arizona Soils Compost)	16,210	Windrow
ARKANSAS			
Bentonville	Operational		Windrow (Scarab)
Eureka Springs	Operational		Windrow
Hot Springs	Operational		ASP
N. Little Rock	Operational (American Composting)		Windrow
CALIFORNIA			
Arcata	Operational	192	ASP
Chino: Inland Empire Util. Agency	Operational	37,500	ASP (In-building)
Dos Palos: Central Valley	Operational (Synagro Technologies)	13,880	Windrow
Fortuna	Operational	112	Windrow
Las Virgenes	Operational	1,586	In-vessel (Siemens IPS)
Los Angeles: Griffith Park	Operational	1,250	ASP
Los Angeles Cty. San. District	Construction	25,000	Enc. ASP (GORE)
Lost Hills	Operational (Liberty Compost)	64,062	Windrow
Morro Bay	Operational	91	Windrow
Ojai Valley	Operational (San Joaquin)	557	Windrow
Redland	Operational (One Stop Landscape Supply)	3,186	Windrow
Santa Maria	Operational (Engel & Gray)	2,686	Windrow (Scarab)
Santa Rosa	Operational	934	In-vessel
South Kern	Operational (Synagro Technologies)	41,465	ASP ¹
COLORADO			
Clear Creek Cty.: Climax Mine	Operational (Parker Ag)	1,000	ASP
Delta WWTP	Operational	250	Windrow
Fountain: Midway Landfill	Operational (Waste Management of CO and A-1 Organics)		Windrow (MASP)
Glenwood Springs	Operational (South Canyon Solid Waste)	500	AW
Granby	Operational	100	In-vessel (ECS ² ; Luck Now)
Gunnison	Operational		ASP
Keenesburg/Rattler Ridge ³	Operational (A-1 Organics)		Windrow (MASP)
Pitkin County	Operational		ASP
Platteville	Operational (A-1 Organics)		Windrow
Silt	Operational		AW
Summit County Resource Allocation Park	Operational	5.5	Windrow (MASP)
Tri-Lakes	Operational		ASP
Vail: Upper Eagle Valley	Operational		ASP
Woodland Park	Operational		ASP
CONNECTICUT			
Fairfield	Operational	650	In-vessel (Siemens IPS; Kuhn)
DELAWARE			
Milford	Operational (Blessings Greenhouse)		Windrow
Seaford	Operational	106	ASP
FLORIDA			
Lee County	Operational	2,850	Windrow (Backhus; Roto-Mix)
Miami-Dade Water Sewer: South Plant	Operational (seasonal)		ASP
Ocala	Operational (CompostUSA)		AW
Okahumpka	Operational (C&C Peat)	4,722	Windrow
Reedy Creek	Operational	2,900	ASP and windrow (Scarab)
Sarasota	Operational		In-vessel (Purac)

nally, *BioCycle* queried equipment vendors for project updates. We greatly appreciate everyone's assistance in providing information. We also welcome feedback on the 2010 data, e.g., facilities missed or ones included that are no longer in operation. Please send updates to Celeste Madtes (csuedit@jgpress.com).

NATIONAL OVERVIEW

Table 2 provides the state-by-state breakdown of biosolids composting projects in the U.S. The "Guide To Table 2" sidebar explains what the abbreviations stand for as well as provides the full company names of the vendors cited. In the second column of Table 2 ("Status"), when a company name is noted after the term "Operational," it indicates that this private entity owns and operates the facility or is the operator contracted by the municipal agency. If no company name is listed, the facility is owned and operated by the public agency.

Based on the survey data, we estimate that 7.8 percent of the biosolids generated in the U.S. are composted. This number is based on the actual dry tons/year provided by facilities (477,009 dry tons/year), plus an estimate to account for the facilities not providing tonnage data (82,546 dry tons/year). That total was used as the basis to calculate our national estimate of 562,000 dry tons/year of biosolids composted. A national survey on biosolids end use and disposal, conducted by NEBRA in collaboration with several other entities (see "Biosolids Management In The U.S.," March 2008), calculated that a total of 7,180,000 dry tons of biosolids were generated in the U.S. in 2004. This national number was used to calculate the *BioCycle*/NEBRA estimate of 7.8 percent.

In terms of geographic distribution of projects, 44 of the 50 states have biosolids composting projects. The six states with no biosolids composting reported are Alabama, Illinois, Louisiana, Minnesota, Mississippi and Nebraska. (Wisconsin does not have a full-scale project, but a pilot is being conducted by the Appleton Wastewater Treatment Plant in conjunction with the Outagamie County Department of Solid Waste.)

Of the 44 states reporting biosolids composting projects, the number per state breaks down as follows: 26 states have less than 5 projects; 9 states have between 5 and 10 projects; 7 have between 10 and 20 projects. Two states have more than 20 projects — New York (25) and Washington (24).

Aside from a few states, there is no obvious link between the climate and the composting method. Many years ago, the trend was toward windrow composting in the Central and Southwest states, and in-vessel and aerated static piles in the Northeast, Mid-Atlantic and the Pacific Northwest. While climate still plays a role, other factors such as emissions regula-

Table 2. 2010 *BioCycle*/NEBRA survey of U.S. biosolids composting projects (cont'd.)

State/Location	Status/Operator	Biosolids Quantity (dry tons/yr)	Composting Method
GEORGIA			
Alto	Operational (Wilcorp Environmental)		Windrow (Backhus)
Dalton Utilities	Operational (Harvest Farms)		In-vessel
Noonan Utilities	Operational		n/a
Plains	Operational (ERTH Products)	8,400	ASP
HAWAII			
Maui Eko Compost	Operational (EKO Compost)	3,090	ASP
U.S. Navy Barbers Point	Operational (One Stop Landscape Supply)	990	ASP
IDAHO			
Coeur d'Alene	Operational	840	ASP
Lewiston	Operational (EKO Systems)		ASP
INDIANA			
Angola	Operational (Soil Solutions)		Windrow (Backhus)
Elkhart	Operational		Windrow
South Bend	Operational		Windrow
IOWA			
Davenport	Operational	5,500	ASP (In-building)
KANSAS			
Olathe	Operational	850	Windrow
Topeka: Oakland WWTP	Operational	2,400	Windrow
KENTUCKY			
Franklin	Operational (Triple M Land Farms)		Windrow
Louisville: Headden Septic Tank Service	Construction		Windrow
Paducah	Operational		Windrow (Scarab)
West Liberty	Operational		Windrow
MAINE			
Kennebunk	Operational (Nest and Sons, Inc.)	160	ASP
Kennebunkport	Operational	62	ASP
Kingfield	Operational		ASP
Lewiston-Auburn	Operational	2,169	In-vessel
Lincoln Sanitary District	Operational	114	ASP
Old Town	Operational	154	ASP
Paris Utility District	Operational	84	ASP
Rockland	Operational (Interstate Septic Systems Inc.)		In-vessel
Rumford-Mexico	Operational	416	ASP
Scarborough	Operational	506	ASP
Unity: Hawk Ridge	Operational (New England Organics)	8,500	In-vessel (Gicom)
Wilton	Operational	39	ASP
Yarmouth	Operational	132	ASP (In-building)
MARYLAND			
Aberdeen	Operational		ASP
Baltimore City/Orgro/Veolia Water	Operational	5,720	In-vessel (CSC Paygro)
Havre de Grace	Operational	300	ASP
Perryville	Operational (Maryland Environmental Service)		ASP
MASSACHUSETTS			
Barre	Operational	60	ASP
Bridgewater	Operational	304	ASP
Dartmouth	Operational	900	In-vessel (Siemens IPS)
Ipswich	Operational (Agresource)	~1,000	ASP
Marlborough	Operational (WeCare Organics)	2,064	In-vessel (Bedminster); AW
Nantucket	Operational		In-vessel (Bedminster); AW
Northbridge	Operational		n/a
Pepperell	Operational	140	Static pile
Somerset	Operational	1,360	ASP
Southbridge	Operational (Veolia)	5,355	ASP
Williamstown/Hoosuc	Operational	5,100	ASP
MICHIGAN			
Ishpeming	Operational	2,000	In-vessel (ECS ² ; Kuhn)
Midland	Operational	70	Windrow (summer only)

Table 2. 2010 BioCycle/NEBRA survey of U.S. biosolids composting projects (cont'd.)

State/Location	Status/Operator	Biosolids Quantity (dry tons/yr)	Composting Method
MISSOURI			
Kansas City	Operational		Windrow
Nixa	Operational		ASP
Sedalia	Operational	320	ASP (ECS ⁴)
Springfield	Operational		Windrow
St. Peters	Operational	1,320	ASP (ECS ⁵)
MONTANA			
Big Sky	Operational	130	In-vessel (ECS)
Butte/Silver Bow	Operational (Big Butte Compost)	4,000	AW
Hamilton	Operational	50	Windrow (Roto-Mix)
Kalispell	Operational (Glacier Cold, LLC)	50	ASP
Livingston	Operational	200	In-vessel (ECS)
Missoula	Operational (EKO Compost)		ASP
NEBRASKA			
Beatrice	Operational		Windrow (Brown Bear)
Grand Island	Operational		Windrow (Wildcat)
Holdrege	Operational		Windrow
Kearney	Operational		Windrow (Wildcat)
Lexington	Operational		Windrow (Wildcat)
Omaha (for city of Bellevue)	Operational		Windrow
NEVADA			
Bently Agrowdynamics	Operational	2,767	Windrow
NEW HAMPSHIRE			
Claremont	Operational		ASP
Dover	Operational		ASP
Merrimack	Operational	1,841	In-vessel (Siemens IPS)
Milford	Operational		ASP
NEW JERSEY			
Buena Borough	Operational		ASP
Burlington County	Operational	9,500	In-vessel (Siemens IPS)
Cape May County MUA	Operational	3,300	In-vessel (Purac)
Ocean County Util. Authority	Operational	9,500	Windrow (Scarab)
Sussex County MUA	Operational		ASP
NEW MEXICO			
Albuquerque	Operational		Windrow (Scarab)
Artesia	Operational	200	Windrow (Brown Bear)
Belen	Operational		Windrow (Brown Bear)
Carlsbad	Operational	153	Windrow
Clovis	Operational		Windrow (Scarab)
Farmington	Operational		Windrow
Hobbs	Operational		Windrow
Los Alamos County	Operational		Windrow
Roswell	Operational		Static pile
Santa Ana Pueblo	Operational		Windrow
Santa Fe	Operational		Windrow (Scarab; Roto-Mix)
Tucumcari	Operational		Windrow
NEW YORK			
Arcade	Operational	65	In-vessel
Attica	Operational	180	ASP
Bath	Operational	2,000	In-vessel (Transform; Supreme)
Chenago Cty.	Operational	230	ASP
Clifton Springs	Operational	40	ASP
Delaware Cty. Co-Composting	Operational	7,000	In-vessel (Conporec/ Siemens IPS)
Endicott	Operational	488	ASP
Ft. Edwards: Washington County SD 11	Operational	600	ASP
Gowanda	Operational	149	ASP (In-building; ECS ¹)
Greene	Operational	12	In-vessel
Lockport	Operational	786	In-vessel (Siemens IPS)
Madison County	Operational	65	ASP (Kuhn)
Manchester-Shortsville	Operational	73	ASP
Medina	Operational	62	ASP
Mt. Morris	Operational	70	Windrow



South Kern, California — aerated static pile composting with biofiltration of process air.

tions, siting and public perception, advancements in process control and availability of bulking agents may dictate technology decisions. For example, air quality management districts in California have been tightening their rules on VOCs and related emissions from composting facilities over the past decade. As a result, some facilities in climates that typically lend themselves to open-air windrow composting — but located in air districts with severe noncompliance — are utilizing aerated static piles with negative air flow and biofiltration, or enclosed aerated static piles with proprietary aeration and cover technologies.

The most common bulking agents (amendments) used in biosolids composting are wood chips made from yard trimmings or recycled wood waste. Some facilities report using sawdust; several also blend in ash from boiler plants or incinerators.

PRIDE IN THE PRODUCT

While gathering information from project managers, we noted consistent enthusiasm about the biosolids compost product. This enthusiasm carried over to facility websites (mostly found by searching on the city or town, then clicking on “wastewater



treatment"). Links to "compost" showed detailed instructions on using the compost, described various blends available and their various applications, pricing, hours of operation and photos of the product being used and the results.

While some facilities give their compost away at no charge, most sell the compost and blends at varying prices. For example, the city of Denton, Texas, which composts about 3,200 dry tons/year of biosolids, sells its finished compost in bulk for \$25/cubic yard (cy). The price range reported by facilities is from \$6 to \$30+/cy. The value of biosolids compost is well-recognized in professional markets, commanding fairly high prices, typically in various soil blends and engineered soils. End uses include golf course design, athletic field construction, high-profile landscaping projects and state Departments of Transportation roadside applications (e.g., for vegetation establishment, slope stabilization and plantings).

Having a paying market for the biosolids compost is an expected outcome of most projects today. For example, one fairly new project in Stafford County, Virginia, operated by the Rappahannock Regional Solid Waste Management Board, set out these market establishment goals for its finished product, Rappa-Grow: "To produce a high quality soil amendment made from biosolids and shredded yard waste; To sell 20 five-gallon buckets of finished compost each week for the first year, ultimately diverting 4,000 tons of biosolids and selling up to 1,000 tons of compost annually; and To teach 225 residents how to compost and divert more than 100 tons of organic waste from the landfill each year."

In one state, a satisfied biosolids compost user (a grower) sent a brief note to the treatment plant commending the nice results experienced in using the city's biosolids compost. "If you told me the compost would help this much I would think you were blowing smoke," he wrote. "But I guess I can't think that way. I soil tested the field. The organic matter and the calcium change are awesome!"

GENERAL TRENDS, CURRENT OBSTACLES

Findings of the BioCycle/NEBRA survey of biosolids composting projects in the U.S. indicate that this management method for wastewater treatment solids is holding its own. The total number of projects is slightly lower in 2010 than in 1998, but new facilities are opening and some existing ones are expanding.

Table 2. 2010 BioCycle/NEBRA survey of U.S. biosolids composting projects (cont'd.)

State/Location	Status/Operator	Biosolids Quantity (dry tons/yr)	Composting Method
NEW YORK (cont'd.)			
Newfane	Operational	293	In-vessel
Ontario	Operational (LBD Enterprises)	53	ASP
Rockland County	Operational	5,600	In-vessel (Siemens IPS)
Schenectady	Operational	2,086	In-vessel (ABT)
Sodus	Operational	20	n/a
Wappinger Falls:	Operational	220	In-vessel
Tri-Municipal Sewage			
Waterville	Operational	250	ASP
Webster	Operational	112	ASP
Weedsport	Operational	36	AW
Yorktown Heights	Operational	300	ASP
NORTH CAROLINA			
Banner Elk	Operational		n/a
Beech Mountain	Operational		ASP
Burlington	Operational		Windrow
Burnsville	Operational		ASP
Dallas	Operational (Earth Farms, LLC)		Windrow (Backhus)
Delway	Operational (McGill Environmental)		ASP (In-building)
City of Goldsboro	Operational	640	In-vessel (Siemens IPS; Roto-Mix)
Hickory-Catawba	Operational	3,129	In-vessel
Lexington	Operational		ASP
Merry Oaks	Operational (McGill Environmental)		ASP (In-building)
Morganton	Operational		ASP
Rockingham	Operational		ASP
Shelby	Operational	4,818	In-vessel (Siemens IPS)
Valdese	Operational		ASP
OHIO			
Akron	Operational	13,000	In-vessel (Paygro)
Columbus	Operational	9,000	ASP
Hamilton WWTP	Operational	1,400	In-vessel (WS)
Lake County: Mentor WWTF	Operational	2,500	ASP
OKLAHOMA			
Ardmore	Operational	520	In-vessel (Siemens IPS; Roto-Mix)
Grove	Operational		Windrow (Brown Bear)
Oklahoma City-North Canadian	Operational		Windrow
Tahlequah	Operational		Windrow
Yukon	Operational		Windrow
OREGON			
Grants Pass: Redwood Sewer District	Operational	769	AW
Klamath Falls	Operational	400	ASP
Newberg	Operational	682	In-vessel (WS)
PENNSYLVANIA			
Athens: Valley Joint Authority	Operational	350	ASP
Centre County: University Area Joint Authority	Operational	2,500	In-vessel (Siemens IPS)
Indiana	Operational	50	ASP (In-building) (Roto-Mix)
Manheim	Operational (J.P. Mascaro)		ASP
Mansfield	Operational		AW
Mechanicsburg	Construction	220	ASP
Springettsbury Twp.	Operational		ASP
Tremont	Operational		Windrow
West Hanover Township	Operational (WeCare Organics)	229	Vermicomposting (Vermitech)
RHODE ISLAND			
Bristol	Operational	475	In-vessel (Siemens IPS)
SOUTH CAROLINA			
Florence	Operational		ASP
Grand Strand Water & Sewer/Myrtle Beach	Operational	700	ASP
Kingstree	Operational (Williamsburg Recycling)	1,600	In-vessel

Table 2. 2010 BioCycle/NEBRA survey of U.S. biosolids composting projects (cont'd.)

State/Location	Status/Operator	Biosolids Quantity (dry tons/yr)	Composting Method
SOUTH DAKOTA			
Rapid City	Operational	2,100	In-vessel (Siemens IPS)
TENNESSEE			
La Follette	Operational	~200	ASP
Sevierville: Sevier SWA	Operational	4,015	In-vessel (Bedminster); Windrow
TEXAS			
Austin: Hornsby Bend WWTP	Operational	6,000	Windrow (Scarab)
Austin: LCRA Highland Lakes	Operational		Windrow
Belton: Brazos River Authority	Operational		Windrow (Scarab)
Bryan	Operational		Windrow (Scarab)
Copperas Cove	Operational		Windrow (Scarab)
Denton	Operational	3,200	Windrow (Scarab)
McAllen	Operational		Windrow (Scarab)
San Antonio: Leon Creek	Operational (Garden-Ville/Texas Disp.)	17,600	Windrow (Scarab)
San Antonio: New Earth Soils	Operational	18,700	Windrow (Backhus)
Texarkana	Operational	1,294	Windrow (KW)
UTAH			
American Fork: Timpanogos Spec. Serv. District	Operational		Enc. ASP (GORE)
Brigham City	Operational		Windrow
Central Davis County	Operational		Windrow (Roto-Mix)
Central Weber	Operational		Windrow
Coalville	Operational		Windrow
Orem	Operational		ASP
Park City: Snydersville Basin	Operational		ASP
Provo	Operational		Windrow
Salt Lake City: Central Valley	Construction		Enc. ASP/Windrow (MOR, Transform, Scarab, Roto-Mix)
South Davis County	Operational		ASP/Windrow
Springville	Operational		Windrow
St. George	Operational		Windrow
Syracuse: North Davis Sewer District	Operational	2,500	Windrow
Tremonton	Operational		ASP
West Jordan: South Valley WRF	Operational		Windrow (Scarab)
VERMONT			
Bennington	Operational	160	In-vessel (Siemens IPS)
Springfield	Operational	150	ASP
Wilmington	Operational	12	In-vessel (Green Mountain)
VIRGINIA			
Franklin	Operational		ASP
Harrisonburg/Rockingham	Operational	4,250	ASP
Livingston	Operational		ASP (Kuhn; ECS ⁶)
Luray	Operational		n/a
New Market	Operational		ASP
Spotsylvania County	Operational	12,000	ASP (Kuhn)
Stafford: Rappahannock Regional SWMB	Operational		Windrow
Virginia Beach: Hampton Roads San. District	Operational	4,180	ASP
Waverly	Operational (McGill Environmental)		ASP (In-building)
WASHINGTON			
Arlington	Operational	500	ASP (ECS ⁷)
Benton County: Horn Rapids Landfill	Planning	748	n/a
Chelan County	Operational	139	Windrow
Cheney	Operational	260	ASP (In-building; Roto-Mix)
Columbia County	Operational		n/a
Entiat	Operational	25	Windrow
Everett	Operational	500	Enc. ASP (ECS)
Forks: Olympic Corrections Center WWTP	Operational	10	ASP

“Growth in the biosolids composting market continues to be steady,” says Tim O’Neil, president of Engineered Compost Systems in Seattle, Washington. “We continue to see more of a market for biosolids composting in places with reasonable access to amendment to mix with the biosolids. One of the biggest challenges we see is competition from cogeneration — burning wood for energy.”

O’Neil adds that although there is flexibility in the types of bulking agent used for composting with biosolids, the bottom line is the biology of the system. “You can skimp, but only to a certain point,” he says. “We have people who use a relatively low ratio of carbon amendments to biosolids. Having a system that is thermally efficient means that they can hit PFRP (Process to Further Reduce Pathogens), but it doesn’t mean they will have a nice smelling compost. With agitated systems, you can get away with a little less amendment, but with static systems you need the bulking agent for the structure.”

In many parts of the country, land application of Class B biosolids is still a lower cost option than composting. In other places, relatively low landfill tipping fees are drawing in more biosolids, especially when access to land application sites decreases due to land development and/or public opposition to current beneficial use practices.

What is abundantly clear from the conversations we had with composting facili-

St. Peters, Missouri — aerated static pile composting with stationary mixer to blend biosolids and ground yard trimmings.



ty operators is that they are having a positive experience with their facilities, both in terms of their operations and the quality — and widespread popularity — of their end products. Whereas in 1998 there were more stories related to challenges with odor emissions, this survey did not find that being reported. The level of knowledge about how to effectively control odors and troubleshoot other operational challenges (e.g., too wet, too dry) is high, and there are plenty of veteran composters in most states who can assist their colleagues when problems arise. Clearly, the successful track record of facilities operating for decades builds greater confidence in the process and product. Additionally, vendors of composting equipment, who also now have decades of experience under their belts with biosolids composting, are an ongoing source of assistance — as are new products and technologies to improve process control and product quality.

One trend to track is more regionalization of biosolids composting, with larger facilities designed to process biosolids from other treatment plants in their area. Part II in the January 2011 issue will explore that trend in more depth based on interviews with several of these larger projects.

A GOOD DECISION

Sharing the experience of the City of Ishpeming, Michigan is not only a positive note to end on, but a sign of what we believe will be happening more over the next few years. Ishpeming needed to find another biosolids management alternative

Table 2. 2010 BioCycle/NEBRA survey of U.S. biosolids composting projects (cont'd.)

State/Location	Status/Operator	Biosolids Quantity (dry tons/yr)	Composting Method
WASHINGTON (cont'd.)			
Fort Lewis	Operational (JBLM)	539	ASP
Granite Falls	Operational	72	AW
Kingston	Operational (Emu Topsoil)		ASP (Roto-Mix)
Laconner	Operational		ASP
Langley	Operational		Static pile
Lynden	Operational	320	ASP (ECS ⁷)
Monroe	Operational		Static pile
Morton	Operational		n/a
Normandy Park:	Operational		ASP
Miller Creek WWTP			
Ocean Shores	Operational	100	In-vessel (ECS ⁶)
Omak	Operational	160	In-vessel (ECS ⁶)
Port Angeles	Operational	1,460	ASP (ECS ⁷)
Port Townsend	Operational	279	ASP (Roto-Mix)
Seattle	Operational (GroCo)		Static pile
Spokane	Construction (Barr-Tech)		Enc. ASP (ECS)
Westport	Operational	100	In-vessel (ECS)
WEST VIRGINIA			
Brooke County	Operational (J.P. Mascaro)		ASP
Wetzel County	Operational (J.P. Mascaro)		ASP
WISCONSIN			
Appleton WWTP and Outagamie County DSW	Pilot		n/a
WYOMING			
Gillette	Operational	750	ASP/Windrow
Sheridan	Operational	200	ASP/Windrow

¹ECS radio frequency teleprobes. ²Stationary vessel with reversing aeration. ³Incorporating feedstocks from Platteville in Spring 2011. ⁴ASP with CompDog™ pipeless aeration. ⁵ASP with reversing and in-slab aeration, bunker walls. ⁶Containerized vessels with reversing aeration. ⁷Reversing and in-slab aeration.

when a long-term agreement with an area landfill came to an end in 2009. “We had a good arrangement for many years with a local landfill,” says Deborah Pellow, Director of Wastewater Treatment for the City of Ishpeming. “We took their leachate and treated it at a reduced cost, and they took our biosolids for free. We were notified in early 2009 that the arrangement would end in 2010, as the landfill would be treating its leachate on site in aerated lagoons.”

City officials had decided before this point that they wanted to switch to a process that yielded a Class A, Exceptional Quality biosolids product. It had focused its evaluations on biosolids drying systems. Ultimately, they decided to go with in-vessel composting, using Engineered Compost System's stationary vessels (the full story will be included in Part II). From a cost perspective, says Pellow, a rough calculation shows that composting is about half the cost of what the city would have paid in tipping fees to continue disposal at the landfill. “Plus, we have a product that is very reusable and we can sell it,” she exclaims. ■

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BioCYCLE

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