

## **12.0 CURRENT MARKET CONDITIONS**

“A good composting facility is first a good marketing company that happens to make compost” (Das, 2000). The idea that if we can make it, people will buy it is one of the great fallacies of the whole by-products recovery industry. It is important to produce a quality product but it is more important to market that product not just so it can be sold, but sold at a highly competitive price. Land application and composting are the most well known methods for beneficial reuse while incineration and landfilling are responsible for the majority of disposal. This section will go into a more detail by citing specific information on companies and individuals that provide disposal options for municipal biosolids.

### **12.1 Land Application**

Henry Floyd, a Cartersville Farmer remarked "It costs so much to build and maintain landfills, and it doesn't make any environmental sense to dump biosolids into landfills when they can be used to grow crops and aid in recycling. We get all the biosolids we can, whether they're wet or dry, because we think it's better than commercial fertilizer" (WEF). This opinion is not shared by all farmers but there are many who understand and have land applied biosolids at agronomic rates that sing the praises of this "product."

The rules and regulations surrounding land application of biosolids are quite extensive, as can be noted in the previous section on the land application permitting processes. One reason for the rigor in requirements is due to the high potential for problems resulting from incorrect application procedures. The idea that the liability is on the biosolids generator sometimes lead municipalities to choose reuse options with less apparent liability rather than dealing with all the monitoring and contract work that is required with land application. Private companies that specialize in land application procedures have been able to capitalize on this by providing a complete service available to municipalities. These services include all phases of land application processes such as site and process permits, land contracts, hauling and truck routes, monitoring and application schedules. Five prominent companies in the private biosolids land application business in Georgia include Biogro, OMI, Synagro, S&ME and Bio-Nomics, INC.. Appendix G contains information for compost & horticultural growers and land application research sites.

### **12.1.1 Biogro**

Biogro is a division of Wheelabrator Clean Water Systems, a subsidiary of Wheelabrator Technologies Inc., that offers a full range of processing and treatment methods that prepare biosolids for beneficial end use. Biogro assembles systems that reduce volume, facilitate handling and transport, destroy pathogens and control odor. With regard to land application of biosolids, Biogro manages all phases of the process. They have specialists that assist farmers, prepare site permits and conduct all aspects of the project so that everything meets EPA, state and regional regulations.

Biogro can be contacted at their main office:  
A Wheelabrator Technologies Company  
180 Admiral Cochrane Drive  
Annapolis, MD 21401  
(410) 224-0022

or locally:  
William Cotter  
PO Box 388  
Pineville, NC 28134  
(704) 752-8673  
[bcotter@wm.com](mailto:bcotter@wm.com)

### **12.1.2 OMI**

OMI, Operational Management International, Inc., is an Atlanta based, employee-owned global leader in the management of water, wastewater and utility systems. OMI offers a wide range of services-from project conception and development to design, financing, construction, and operations and maintenance (O&M) for customers in government and industry. The company manages more than 140 facilities around the world. The company has been managing water and wastewater systems for municipal clients throughout Georgia since 1982.

OMI presently works with many Georgia municipalities with various water and wastewater projects. Some of their Georgia clients include Americus, Barnesville, DeKalb County, Forsyth, Gwinnett County, Hinesville, Houston County, Rockdale County, Swainsboro, Vidalia, Vienna, Warner Robins, Warrenton, Washington, and Wrens.

OMI can be contacted at their main office:  
PO Box 6607  
6060 South Willow Dr. Suite 200  
Greenwood Village, CO 80111-5142

or locally:  
Langley Commons  
175 Langley Drive, Suite C-4  
Lawrenceville, GA 30045  
(770) 237-0324

### **12.1.3 Synagro**

Synagro Technologies Inc., with headquarters in Houston Texas, is a provider of turnkey operations of municipal biosolids land application technologies. Presently, Synagro collects, transports, treats and beneficially reuses the biosolids generated by municipal, industrial, commercial and residential customers in more than twenty states with a state of the art biosolids management program in Georgia. They promise to help clients ensure residual quality to make every land application a success, alleviate paperwork burden from clients by automatically filing with authorities in the client's name and even will provide seminars and meetings to help educate and improve communities understanding of land application of biosolids.

Synagro can be contacted at their main office:  
1800 Bering Drive, Suite 1000  
Houston, Texas 77057  
(800) 370-0035

Or locally:  
Frankie Singleton  
PO Box 1770  
6490 Stadium Drive  
Clemmons, NC 27012  
(877) 267-2687

### **12.1.4 S&ME, Inc.**

S&ME, Inc. began it's residual management program as an integral part of an environmental and geotechnical services business. S&ME provides residuals management services to include:

- |  |                                |
|--|--------------------------------|
| - Residual Solids Management Plans     | - Crop Management Plans        |
| - Land Application Feasibility Studies | - Nutrient Management          |
| - Permit Acquisition                   | - Land Acquisition             |
| - Regulatory Oversight                 | - Agronomic Services           |
| - Soil Science Services                | - Record Keeping and Reporting |

Some of their clients are staffed and skilled in these services areas, but contract with S&ME for those services they are not equipped to perform. S&ME will tailor it's services to each client's specifications. S&ME does not perform land application, but can recommend land application contractors to perform spreading, pumping and hauling operations.

S&ME can be contacted at their main office:  
3718 Old Battleground Road  
Greensboro, NC 27410  
(800) 849-2985  
[www.smeinc.com](http://www.smeinc.com)

#### **12.1.4 Bio-Nomics Services, INC.**

Bio-Nomics is one of nineteen Carylton Companies that provide industry, municipalities and utilities with services maintaining process efficiency and environmental compliance. Bio-Nomics specializes in liquid waste management with innovative alternative disposal options for dewatered sludge cake such as incorporation with building materials. Utilizing specialized equipment they offer pumping, hydraulic dredging, dewatering and land application of liquid waste and dry waste. Bio-Nomics has performed land application to public and private lands for many Georgia Municipalities including Newington, Ocilla, Fitzgerald and Columbus.

Bio-Nomics can be contacted at their main office:

Bio-Nomics Services, INC.  
516 Roundtree Road  
Charlotte, NC 28217-2133  
(704) 529-0000  
(800) 782-6798  
[bio-nomic@worldnet.att.net](mailto:bio-nomic@worldnet.att.net)  
[www.carloncorp.com](http://www.carloncorp.com)

## **12.2 Composting**

As was stated earlier, market development is important for all products and especially critical for those products where a market may have to be created. Soil amendments derived from biosolids may be considered a new product in a specific region. POTW operators are highly skilled professionals that specialize in producing clean water from wastewater and as a result of this process, produce biosolids. Many times, the development of compost marketing strategies may not be an operators forte. There are marketing services that specialize in preparing and implementing marketing strategies specifically for compost.

### **12.2.1 Erth Products, LLC**

The literature has many accounts citing transportation costs as the single largest cost in influencing the success of any composting or beneficial re-use project (Kriesel, 1994). “Most important factor in the business” was the answer from Wayne King Sr., president of Earth Products LLC, when asked about the transportation aspect of his biosolids composting business. Earth Products is a static pile composting facility, located in the South GA town of Plains in

Sumpter County, that has 3-5 year contracts with many wastewater municipalities in and around the metro Atlanta area. Instead of sending an empty truck the 135 miles to Atlanta just to pick up biosolids, Mr. King transports finished product to Atlanta on the northbound route and biosolids return on the same southbound truck. By synchronizing shipping schedules for feed stock and market products, the shipping economics have been successful.

Erth Products was designed with growth in mind. The design capacity of the Plains facility is 500 wet tons of sludge a day and they are presently running at 200 wet tons a day. With capacity available, the composting operation has good flexibility with the type and consistency of the biosolids feedstocks. Any class sludge either digested and undigested can be composted with no problems. One selling point for municipalities is Erth Products ability to receive varying solids contents of sludge.

Erth Products markets its final compost under the name Erth Food. Erth Food is marketed in 17 states and several countries. Erth Food is marketed to landscape and development companies (26), golf courses (13), independent retail nurseries (31) and large distributors (14) at competitive prices.

Erth Products can be contacted at their main office:

Wayne King  
402 Line Creek Drive  
Peachtree City, GA  
(770) 487-6677  
(800) 28606677  
[Compostking@mindspring.com](mailto:Compostking@mindspring.com)

### **12.2.2 AllGro**

AllGro, a Wheelabrator Water Technologies Company, specifically provides compost marketing services to producers of quality compost. These services include development of advertising and sales literature, product recommendation sheets, product testing, university demonstrations, individual sales contacts, product distribution, delivery, invoicing and collection.

AllGro can be contacted at their main office:

Liberty Lane  
Hampton, NH 03842  
(800) 662-2440

The large companies that provide land application services also provide some levels of composting services. In Georgia, the majority of all composting operations is performed by the wastewater facility in conjunction with the local government or a third party company.

### **12.2.3 Clayton County Northeast**

In the process of writing this report, the Clayton County in-vessel composting operation closed down and stopped all operations. Clayton County decided to close this particular facility when it began to analyze the economics of operation to dispose of one ton of sludge and realized that it was costing much more than other disposal options. This operation, located in a residential neighborhood, was making an exceptional quality product with minimal to no production odor problems, and even bagged and effectively marketed the final compost. So why did it close down? Even when everything is being done correctly and effectively, the actual operating costs, those including salaries, utilities etc, to dispose of a small amount of biosolids, far outweighed the economics of scale. Still wishing to beneficially reuse their biosolids, Clayton County now has a contract with EarthFoods LLC, located in Plains, Georgia to take and compost their biosolids. Even with the cost for hauling biosolids 135 miles, Clayton County actually saves over \$1000/day by not operating their in-vessel composting facility.

### **12.3 Vermicomposting**

Work in the past has shown that earthworms can be used to breakdown activated sewage sludges to finely divided materials in a process known as vermicomposting (Edwards, 1988). The worms derive their nutrition from the organic matter, and in turn aerobically enhance the decomposition of the sludge. The worms maintain aerobic conditions in the mixture, ingest solids, convert a portion of the organics into worm biomass and to respiration products, and expel the remaining partially stabilized matter (Loehr, 1988). With volume reduction of solids at approximately 50% in only a matter of days, worms command attention as an alternative method for biosolids disposal. The end products of vermicomposting is a highly desirable soil like product known as castings and worms. Both castings and worms are being sold to both the wholesale and retail markets.

Brigid Dougherty of the Center for Agribusiness & Economic Development at the University of Georgia, wrote a report entitled “Market Opportunities for Biosolids-Based Vermiculture in Georgia.” She analyzes the market potential for vermiculture derived products. The full report can be found in Appendix H.

### 12.3.1 Orange County EPD

The Orange County (Florida) Environmental Protection Division (OCEPD) did research into the use of earthworms as an alternative pathogen stabilization method for biosolids. A partnership was formed in 1995 between the OCEPD, American Earthworm Company and the City of Ocoee, Florida with the goal of developing a Class A pathogen reduction method that is both cost-effective and meets all the criteria put for by the government.

After an initial pilot scale test, a full scale demonstration was performed. In order to meet all Part 503 requirements, the demonstration project needed to demonstrate a three to four-fold reduction of pathogen indicators that had been spiked into the biosolids in the test and control plots. Two rows (1.5m x 6m x 20cm), one test and one control were inoculated with 10<sup>5</sup> spike of fecal coliform, *Salmonella sp.* and enteric virus. Viable helminth ova was tested at a later time. The test row was seeded with *E. foetida* at a 1:1.5 earthworm biomass to biosolids ratio which is equal to the worm’s feeding rate in a 24 hour period. Results of the test are presented in Table 29. The results demonstrate that the EPA’s required pathogen reduction for indicator organisms was reached, suggesting that vermicomposting can be used as an alternative method for stabilization of Class A biosolids. In order to obtain the vector attraction requirements, the castings would need to be air dried to approximately 75% solids (Eastman, 1999)

**Table 29. Results of Full Scale Vermicomposting Pathogen Stabilization Test**

Pathogen	Time	Test Plot			Control Plot		
		Baseline Ave	Fold Reduction	% Reduction	Baseline Ave	Fold Reduction	% Reduction
Fecal Coliform	24	8.5x10 <sup>9</sup> MPN/1g	6	98.7	8.3x10 <sup>9</sup> MPN/1g	1	20
Viable Helminth Ova	144	8.26x10 <sup>5</sup> eggs	6	98.87	8.41x10 <sup>5</sup> eggs	1	74.24
Enteric Viruses	24	1.97x10 <sup>5</sup> PFU/4g	6	98.92	1.73x10 <sup>5</sup> PFU/4g	1	53.8
<i>Salmonella sp.</i>	24	4.6x10 <sup>9</sup> cell/25mL	13	99.99	5.2x10 <sup>9</sup> cell/25mL	3	93.18

### 12.3.2 Sunbelt Outdoor Supply

The Withlacoochee Wastewater Treatment Facility, located in Valdosta Georgia, has contracted with Sunbelt Outdoor Supply (SOS), located in Quitman Georgia, to supply SOS with biosolids that are used in a vermicomposting operation. Red Wiggler worms are used to compost approximately 2 wet tons/week of the Class B biosolids into an Exceptional Quality soil amendment that is sold to gardeners and nurseries. A second product of vermicomposting is the worms that are harvested and sold as fish bait in the local market. Both the castings and worms are considered “high end” products that command a respectable price when sold retail. Bob McKissack, owner and manager of Sunbelt Outdoor Supply, is enthusiastic about the potential to use vermicomposting on a large scale as a primary means of biosolids utilization for wastewater treatment plants.



**Picture 5. Bob McKissack, owner of Sunbelt Outdoor Supply, harvesting worms**

Vermicomposting is a relatively new process for Georgia in the field of waste utilization on a large scale. In order to facilitate vermicomposting as a viable beneficial reuse method, the University of Georgia’s Engineering Outreach Program has been working closely with the Withlacoochee Facility, SOS, and the EPD to ensure that all needed tests and requirements are accurately performed and met. Plans to scale up operations are in the works that will accommodate much higher volumes of biosolids.

## **12.4 Pelletization**

In Georgia, only Clayton County Water Authority has a working operation that pelletizes approximately 4,700 dry tons of sludge a year. The main reason that no other municipalities have chosen to pelletize biosolids is due to the high capital, operational and maintenance costs that such a facility requires and the need to market to commercial operations. As with the in-vessel composting facility that Clayton County closed down in the fall of 1999, the pelletizing operation is not necessarily the most cost efficient reuse method but it is definitely one of the most “environmental friendly” beneficial reuse operations in Georgia, cornering many awards and positive recognition.

## **12.5 Incineration**

While only six Georgia facilities are permitted to operate an incinerator for the purpose of biosolids disposal, they dispose of 23% of all Georgia’s biosolids. The 40 MGD wastewater facility incinerates over 12,000 tons/year of dewatered sludge and produces over 1,300 dry tons/year of ash. This is equal to almost a 90% reduction rate of the total solids. The final product, which is an inert ash that is approximately 1% carbon, is presently going to landfill.

### **12.5.1 R.M. Clayton**

Unlike R.L. Sutton, R.M. Clayton in Atlanta has contracted the “disposal” of their incinerator ash with General Shale, located two miles from the facility, to be used in the brick making/coloring process. Although General Shale charges between 18-22 \$/ton to take the ash, the POTW is still saving money by avoiding transportation and landfill tipping costs that range from 25-30 \$/ton. Another benefit that R.M. Clayton has seen with there process is that of capturing methane gas off the sludge digesters. The captured methane gas is then used to fuel the incinerators making the incineration a sustainable operation. More methane gas is captured then used as a fuel on site and this has lead to plans to further clean and sell the gas as a marketable commodity.

## **12.6 Landfilling**

The driving force of today's market is economics. What is the cheapest and most effective way to produce a safe and reliable product? In the case of biosolids disposal and utilization, the question may be "what is the cheapest and easiest way for me to get rid of my biosolids?" Many times the "ease" of which biosolids can be used or disposed plays a significant role in the decision process. For this reason, landfilling has become the default method of biosolids disposal for Georgia with over 40% of all biosolids going to landfill. In many cases, it is simply easiest to contract with a company to haul it to the landfill. Landfilling of biosolids carries no long term liability and no problems with permitting and regulations on the part of the generator. Tipping fees for landfilling biosolids at permitted landfills vary at each landfill but normally has a range between 25-35 \$/ton. This does not include transportation cost which will vary with quantity and distance.