

A Biosolids Public-Private Partnership Success Story in Charlotte County

Robert Pepperman

Charlotte County, located in southwest Florida, provides many services to its 165,000 full-time residences. Like most communities in the Sunshine State, Charlotte County experiences the seasonal migration of “snowbirds” during winter months; the County Chamber of Commerce projects the population swells by about 30 percent in the period between January through April.

Charlotte County Utilities (CCU) provides potable water and wastewater treatment and disposal, and reclaimed water for irrigation, serving more than 60,000 homes and businesses throughout unincorporated Charlotte County. Four wastewater treatment facilities are operated by CCU: Burnt Store Water Reclamation Facility (WRF), able to treat 0.5 mil gal per day (mgd); the 2-mgd Rotonda WRF, which is a membrane bioreactor (MBR)-style plant designed to mechanically filter wastewater and to provide an environment for biological nutrient removal (BNR); the West Port WRF, which treats 1.2 mgd; and the 9-mgd East Port WRF. The East Port WRF receives and dewateres residuals from the

County’s other plants. Historically, CCU transported its dewatered biosolids to a private landfill approximately 100 mi away.

Solid Waste Management (SWM) provides solid waste and recycling services throughout the County. The 108-acre County SWM landfill, located on Zemel Road in the southern portion of the County, is a key component of these services. The Zemel Road Landfill was opened in 1975 and is projected to be in operation until 2026. As part of the development of the facility, several important infrastructure improvements sized to support the built-out landfill were made, including surface (storm) water collection and retention, leachate treatment and disposal, and a landfill gas collection system. Additionally, the County developed an approximately 10-acre portion of the landfill on which white goods, yard waste, and tires could be collected and prepared for recycling.

The maps (Figures 1 and 2) show the location of Charlotte County in Florida and generally depict the location of the Zemel Road Landfill near the south-central border of the County near Lee County.

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In 2007, the County solid waste management team recognized that the 10-acre processing area (Figure 3) might have an additional use—composting of CCU’s biosolids. By composting at Zemel Road, CCU could reduce its transportation costs considerably, while also reducing the “tipping fee” it paid to a third party. Prior to that time, SWM engaged an outside vendor to grind yard waste, and then the ground yard waste was utilized as cover on the landfill. Blending the two streams would save the County money, while still providing the cover material needed.

The solid waste team isolated an approximately 1-acre area within the processing area by creating a “speed bump” berm on the perimeter. Within that area, SWM received dewatered biosolids from CCU and blended it with ground yard waste. Windrows were created and SWM

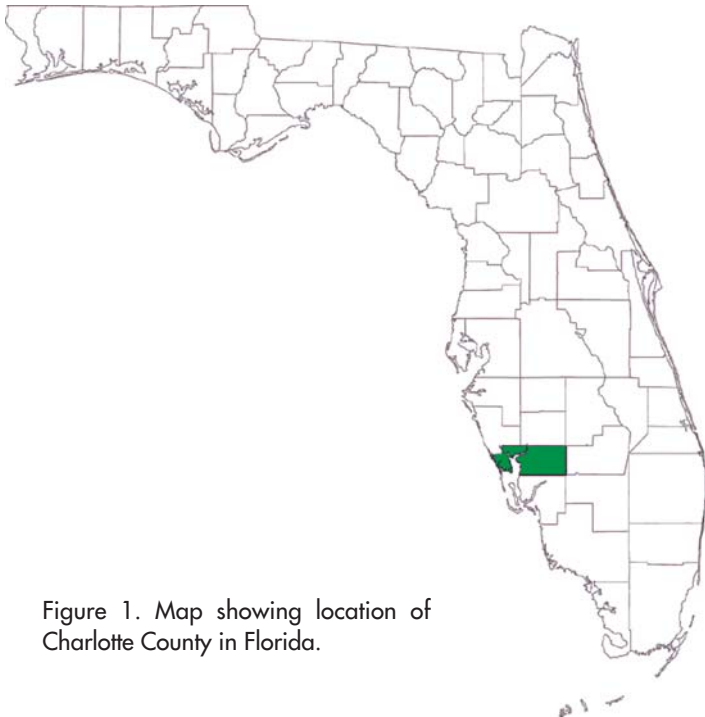


Figure 1. Map showing location of Charlotte County in Florida.



Figure 2. Map depicting general location of Zemel Road Landfill.

added an “enzyme” that claimed to accelerate the composting process. The windrows stayed in place for about four weeks (the windrows were not turned or aerated by any mechanical means), during which time the temperatures were monitored to demonstrate compliance with Class A pathogen reduction standards. After any windrow had achieved the regulatory-mandated time and temperature, the mixture was moved to the landfill for use as final cover. No attempt was made by the County to certify the compost as meeting Class AA standards, and therefore, there was no development of a market for the compost.

At about the same time, SWM recognized that the landfill gas produced could have value in the marketplace. In 2008, it entered into an agreement that allowed a private third party to collect and treat the landfill gas and then install engines to produce electricity. The third party entered into a power purchase agreement with a local utility, and development of the landfill gas-to-energy facility proceeded for the next few years.

As the planning and development of this project commenced, the SWM team recognized that much of the energy derived from producing electricity via internal combustion engines would be lost in the form of exhaust heat and jacket cooling water. Synagro, which dries biosolids for other Florida municipalities, was one of the companies contacted by SWM to determine if there was an interest in utilizing the “waste heat” to dry biosolids. While Synagro’s development team and engineers determined that the waste heat could be utilized to dry biosolids, the amount of waste heat available was insufficient to process enough biosolids to recover the capital and operating costs for the drying facility.

In addition to operating nine biosolids drying facilities, Synagro also operates several regional or merchant composting facilities. These other operations provided its development team with a unique perspective—it was able to envision developing a regional composting facility on the 10-acre site on which the County was already managing yard waste and composting CCU biosolids.

Synthesis of the Public-Private Partnership

Synagro manages the biosolids for over 20 communities in Florida. The value proposition for many of its clients has two key factors as its foundation:

- Many treatment facilities do not treat their sludge to a degree that meets land application standards. As a consequence, a substantial



Figure 3. County’s 10-acre processing site.

mass of the state’s wastewater solids are disposed in landfills. The Florida Department of Environmental Protection (FDEP) estimates that, in 2012, approximately 111,552 dry tons of biosolids were disposed in landfills, representing about one-third of the state’s total production.¹

- Few smaller facilities have installed their own dewatering systems. Synagro operates nine mobile centrifuges throughout the state, rotating these units among plants without internal dewatering. After dewatering, Synagro transports and manages the cake solids.

Many of the dewatered solids in southwest Florida have to be disposed in landfills that are generally 50-150 mi from the point of origin. Transportation costs, as well as landfill tipping fees, have been escalating over the past few years. Transportation costs are largely a function of fuel, and in the 2010 time frame, over-the-road diesel fuel was in a rising environment, ultimately reaching just around \$4.00 per gal in 2011-14.²

During this time, FDEP was in the process of modifying its biosolids land application regulations to limit nutrient applications in the sensitive waters of the state; in the case at hand, most notably the Okeechobee drainage shed, which includes the Caloosahatchee River (Figure 4). As land application became less viable

as a management technique for biosolids generated in southwest Florida, landfill pricing also started to climb. Tipping fees at the few landfills in central Florida that were able (and willing) to accept biosolids began to escalate from the mid-\$20’s per ton to \$38-\$45/ton almost overnight. Odor, structural stability, and regulatory limits on the ratios of biosolids to solid waste were all cited as the reasons for these increases, but whatever the reason, costs of disposal were becoming problematic for the partner generators.

Under these circumstances, it became clear that controlling its own biosolids management site would provide value not only to the company but also to its customers and partners. The Zemel Road site provided a tool to reduce transportation costs for Synagro’s municipal partners, while avoid paying tipping fees to third-party companies.

The Public-Private Partnership

The public-private partnership, or P3, business model is typically a tool by which a community and private enterprise can expeditiously develop and implement a project that serves the community’s stakeholders, while relying on the expertise of the private entity to design, operate, and maintain the project; in

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some cases, the private entity also provides financing for the project, and ownership of the project or assets typically resides with the financing entity.

The preferred P3 project format is often a function of the time available to meet the project goals and the relative cost of money. Where an expedited project delivery schedule is necessary, a P3 with a design-build component accelerates the project (versus the traditional design-bid-build).

When municipal capital is limited or needed for other improvements, a design-build-finance-own-operate-and-maintain (DBFOM) delivery is preferred. In such arrangements, the private entity will typically provide an equity investment to enhance financing. Where the community has capacity to obtain capital through general obligation bond issuance or other low-interest programs, a design-build-operate-and-maintain (DBOM) format fits best in this scenario.

Synagro has been operating with its partners under P3 approaches since the early 1990s, when it developed one of the first biosolids public-private partnerships with the City of Balti-

more. That project was delivered under a DBFOM approach, which built a biosolids drying facility sized to process 110 dry tons per day that has operated for the past 20 years. That contract was recently renewed by the City for an additional 10-year period.

Through this project and the dozen or so subsequent P3 projects undertaken, several key factors that can make (or break) a successful partnership between the community and the private sector were identified. These include:

- Early and appropriate establishment of roles, goals, support, and objectives for all involved stakeholders to ensure that all of the P3 issues can be predicted and solved. It is imperative to have a “win-win” situation for all parties so that the stakeholders can see the true value in the partnership
- The public entity should take the initial step to ensure that the private entity has the appropriate resources (financial, technological, experience, and support) to deliver on its P3 commitments.
- Once the private firm is successfully vetted, the next step would be to establish the P3 relationship among the parties, including hav-

ing open, honest, and consistent communications.

- A legal framework favorable to the successful completion of the project is imperative. The framework should not only spell out the commitment and responsibility of the public and private sectors to the arrangement, but also provide for appropriate milestones by which the performance of the parties can be judged. Ultimately, to secure the success of P3 projects, both the public and private sectors should bring their complementary skills and commit their best resources to achieve a good relationship.

The Charlotte County project generally followed these tenets as described in the following.

Charlotte County Biorecycling Center (CCBRC)

In April 2011, after the initial site review to consider the potential for use of the landfill gas-to-energy waste heat for drying, a concept was presented for use of the 10-acre area for a regional composting facility to the County’s solid waste team. A P3 relationship was suggested, based on the landfill gas-to-energy agreements through which the County would be entitled to certain “host” benefits in return for allowing Synagro to develop a composting facility on site.

Some of the host benefits offered to the County included:

- Lease payments
- Host fees for out-of-county biosolids delivered to the facility
- Elimination of certain expenses incurred by the County
- Local employment opportunities
- CCU biosolids management costs maintained at below market rates

To comply with Florida procurement law, Charlotte County issued a request for proposal (RFP) in July 2011, seeking firms that could enter into an agreement to lease and develop a composting facility on the 10-acre site at the Zemel Road Landfill. Through the RFP, the County indicated that the site available was only about eight acres (reserving some of the 10 acres for the landfill gas-to-energy operations), but also suggested that the adjacent 10 acres of unimproved land could be leased as well. The County indicated that it received about 9,000 wet tons per year of dewatered biosolids, along with approximately 23,000 tons of yard waste per year, that the project would have to assimilate. So as not to take away from any future capacity of the landfill leachate treatment facility, the County required the selected

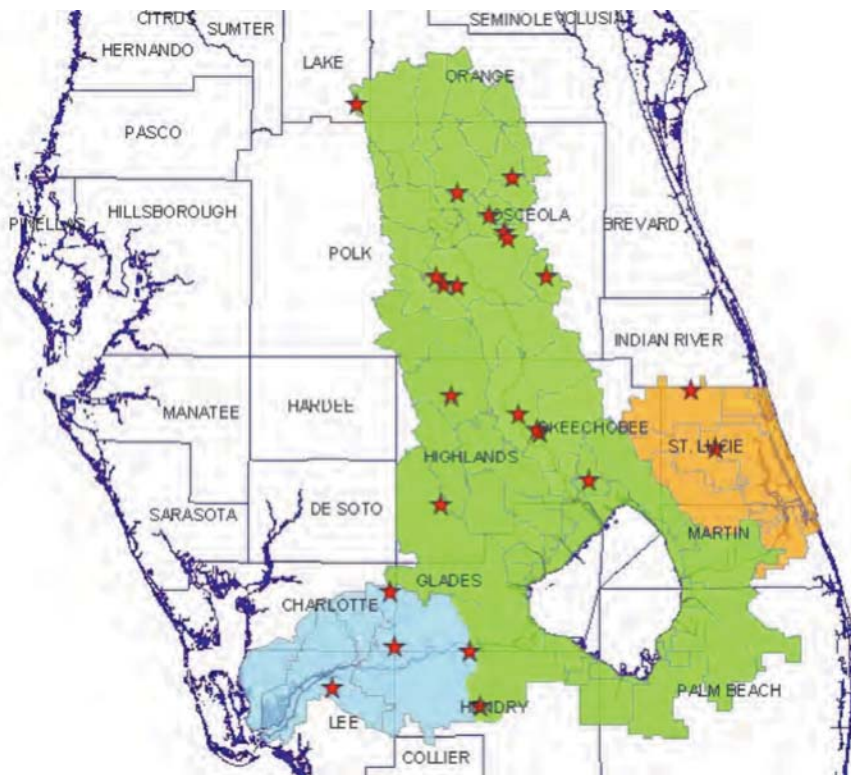


Figure 4. Permitted land application sites affected by new FDEP rule making³.

firm to install a canopy system over the composting site.

Two proposals were submitted to the County in August 2011 and it selected Synagro's proposal as the preferred submission. Synagro's proposal mirrored most of the other major public-private partnership arrangements in which the company had entered:

- ◆ *Lease and Hosting Benefits* – A 20-year lease for the site. The overall financial benefits to the County proposed were on the order of \$280,000 per year, or more than \$5,600,000 over the term of the lease. Among the benefits offered to the County was a supply of compost needed for landfill cover.
- ◆ *Guaranteed Performance* – Complete performance responsibility is guaranteed. For example, if some compost doesn't meet Class AA standards or if the facility temporarily does not have enough capacity to meet demand, there will be alternative disposal outlets available to manage such materials and/or put in the overtime necessary to re-compost those materials at no additional cost to the generators.
- ◆ *Product Marketing* – An internal product marketing group and a strong presence in Florida. The company is active in the groves and other agricultural enterprises in the region and can distribute products to those entities while building a more consumer-oriented market.
- ◆ *Reduction in Risk* – An inherent aspect of the product marketing responsibility is acceptance of product liability. Experience in product marketing allows for routine testing to confirm suitability of the compost for distribution, while carrying the appropriate insurance coverage to insulate Charlotte County from product liability issues.
- ◆ *Complete Regulatory Compliance* – Responsibility for regulatory compliance and reporting responsibilities for all generators. Work is carried out to assure compliance with Class AA standards, all sampling and analytical work is conducted with myriad reporting provided, and record keeping is done for both the compost process as well as the product that would serve multiple regional generators. Responsibility for all billing, collection, coordination of delivery, and associated paperwork.

After several rounds of negotiations, Charlotte County and Synagro entered into two agreements: a site lease agreement and a biosolids management and recycling agreement. The former document was fairly standard in that it provided a term (concurrent with the biosolids

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management and recycling agreement), the lease payments and schedules, and confirmed Synagro's ownership of the equipment and improvements made to facilitate composting.

The biosolids management and recycling agreement was tailored to the project and provided for a number of key components. Some generic or commonly incorporated provisions included:

- ◆ *Force majeure/change-in-law/uncontrollable circumstances:* These clauses describe how the parties may interact during these events, which are largely out of the control of either party.
- ◆ *Term:* The agreement provides for a 20-year base term with potential extensions and allows the County to purchase the facility at termination.
- ◆ *Design-Build-Own-and-Operate:* Responsibility for all aspects of the project belong to the company including:
 - Permits to construct, operate, and market the compost are in its name
 - Payment for external utilities
 - Obligation to produce Class AA compost
 - First right-of-refusal on adjacent land if expansion desired
 - All contracts and associated services/requirement for out-of-county biosolids are entered into by the company

In addition, the biosolids management and recycling agreement contains some project specific aspects, such as:

- ◆ Provides for County benefits including:
 - Below market rates for processing CCU biosolids
 - Host fee on out-of-county biosolids
 - Allows elimination of certain County costs (e.g., purchasing "enzyme" that represents an approximate \$70,000-per-year savings)
 - Compost available for landfill cover
- ◆ The company enjoys certain infrastructure benefits, such as:
 - Roadways are maintained by the County
 - CCU biosolids and county-generated green waste are delivered by the County to the site
 - Stormwater system is maintained by the County
 - County accepts wastewater generated by the composting facility

In order to minimize the impact to this latter benefit, covers on the active composting area were required in the RFP and were incorporated into the proposal.

Immediately after entering into the agreements with the County, the company sales and

development staff began the process of filling the facility's capacity. Some of that capacity was filled by the existing dewatering and solids management clients, but a substantial portion was also available for new customers. In reaching out to regional generators, two very surprising phenomena occurred:

1. For years, regional utilities and publicly owned treatment works had been solicited to sign commitment letters to support the "next big thing" that would solve all their biosolids management woes. These entities stated that they would consider sending their solids to the facility only after it was built.
2. Some generators just don't care about saving money. Transportation and composting capacities were offered to several generators with demonstrations on how they could save as much as 30 percent of current costs for landfill disposal, but surprisingly those generators weren't interested.

Nevertheless, the company responded to an RFP developed by the Englewood Water District (EWD) and entered into a 20-year contract that provided for delivery of its biosolids to the CCBRC. Several other clients were subsequently able to piggyback on the EWD contract.

The company's design-build contractor, Mills-Gilbane, initiated the construction of the facility in September 2013 and the Charlotte County Bio-Recycling Center began accepting biosolids for processing in February 2014. This very short construction period highlights one of the advantages of a public-private partnership—the private developer can expedite commercialization of the facility and the public partner enjoys services at the earliest possible date.

Conclusions

The first full year of operations has brought with it some challenges, along with the benefits of the P3. A primary attribute of a true P3 project is the capacity of the private partner to make changes on the fly.

Composting facilities are operated in other parts of the country, but few of those have the rainfall intensity in southwest Florida during the rainy season. The common afternoon thunderstorms last only a short time, but they produce prodigious amounts of rainfall. Much of the time, the rain will appear to fall almost horizontally; as a result, the windrows under the canopies were getting wet and the water was ponding within the canopies. While the temperatures necessary to meet Class A and vector attraction reduction (VAR) were never lost, trying to screen wet compost was difficult.

To remedy this, side walls were installed for the canopies and, last summer, some changes were made to the grading and stormwater management system. As a result, there is dryer product coming from the canopies and into curing.

Operations were planned for the seasonal impacts of increasing biosolids production during the November to March period. Based on some local records, it was extrapolated that the facility might receive 1,100-1,200 wet tons per week during peak production. However, because some customers had put off cleaning out tanks or disposing of excess biosolids knowing that the CCBRC would be on-line in early 2014, there were a few weeks with as much as a 50 to 60 percent increase over the average.

Even though CCBRC was capable of processing these large slugs of biosolids, diversion of solids to other outlets could be done if necessary. A guarantee was provided to customers stating that even if the facility is unable to handle the load, the biosolids would be managed in other acceptable ways at no additional costs to the generator.

While work continues on some of the challenges that are always encountered with a facility start-up, the facility is producing quality compost, the product is moving to end-users, and the generators are being well-served.

Charlotte County has seen continued benefits through increased revenues (host fees on out-of-county solids), a reliable outlet for the CCU biosolids, and adequate cover to meet the landfill's needs. A first-anniversary meeting was held in February 2015, with issues discussed and other areas of cooperation explored. Going forward, these meetings will be regularly scheduled in order for both parties to best support each other and the partnership.

References

- ¹ Biosolids in Florida: 2012 Summary, Domestic Wastewater Section, Florida Department of Environmental Protection, December 2013.
- ² Gulf Coast No. 2 Diesel Ultra Low Sulfur (0-15 ppm) Retail Prices, 2007-2014, U.S. Energy Information Administration.
- ³ Northern Everglades and Estuaries Protection Program, 373.4595, F.S, from "Overview of DEP's New Biosolids Rule Chapter 62-640, Florida Administrative Code (F.A.C.);" Presented by Maurice Barker, Biosolids Coordinator and Cheryl Minsky, Biosolids Specialist, Division of Water Resource Management, Florida Department of Environmental Protection. ◊