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- 6) Grant Request Amount: \$536,820
- 7) Project Timeframe (months): 24 months
- 8) Project Abstract:

Sarasota County Government seeks funding to develop Florida's first integrated food discard management program using an intrinsic value hierarchy. Significant quantities mean significant opportunities. FDEP estimates 1.3 million tons of food waste was collected in Florida in 1998.

The program will collect food discards generated by supermarkets, restaurants, and institutions (e.g., schools, prisons) and distribute it within the community based on the food's highest and best value.

1. **Food for People:** food that is of highest quality will be collected by a local food bank.
2. **Food for Animals:** food that is of good quality, but not suitable for human consumption will be collected by the food bank in special containers and aggregated for pick up by local farmers.
3. **Food for Plants:** food that is not suitable as food will be collected and processed through composting and vermi-composting into valuable soil amendments.

Each of these program components will function independently, yet complement one another, and form a food discards management pyramid. This powerful diversion strategy, which is unique in Florida, will capture the greatest value in food discards from an environmental, social, and cost-effective standpoint. In addition to food, this project will recover: food soiled paper, yard waste, unmarketable paper (e.g., paper materials recovery facility (MRF) residue), waxed cardboard, and other components of the MSW stream, qualifying this project as addressing "targeted materials."

Innovative Technologies and Processes

Food discards account for 5% to 10% of the overall municipal solid waste stream (exclusive of industrial discards) and offers a huge opportunity for recovery of value from materials otherwise destined for disposal as waste.

Not in common use in Florida.

- ***Integrated Hierarchy.*** Not one Florida county has implemented a sustainable, integrated food discards management hierarchy.
- ***Source Separation.*** There are no permitted source-separated food discards composting programs utilizing post-consumer materials currently operating in Florida. Only Sumter county composts any appreciable quantity of food discards, and there the food is mixed with MSW. The product, a mixed-municipal-solid-waste compost, has limited end-market applications.
- ***Vermi-composting*** is not in common use in Florida on a commercial scale and, up until now, has not been used as a technique for increasing the value of compost. In addition, the vermi-composting system will be constructed of recycled and/or reused materials (minimum 25%).
- ***Innovative Carbon Sources.*** We will develop procedures for incorporating innovative carbon sources (food-soiled paper, wax cardboard, unmarketable paper) for compost bulking while maintaining quality controls. While attempts have been made to incorporate these challenging materials, this project will combine evaluation of recipe formation with processing method to arrive at sustainable programs that will last beyond the grant period.

Novel application of an existing technology or process.

- ***Hierarchy of Diversion.*** Hierarchical use of food discards, source reduction (food for people), food reuse (as animal feed); food recycling (including onsite in-vessel composting and vermi-composting). While each of these individual components have been used throughout the ages to manage food discards, our holistic, integrated approach is a novel one.
- ***Co-Collection Efficiency.*** Some near-expiration foods that are appropriate for animal feed can be co-collected with food for people, while maintaining compliance with FDA and supermarket guidelines for food safety. This novel approach will save farmers time and increase the supply of fresh food for animals.
- ***Permit.*** The project will seek a solid waste permit to accept and compost food discards and develop guidance for others seeking permits to compost source-separated organic MSW. The permit process is used to protect human health and the environment. The Project Team will work closely with FDEP to share information about successes and challenges in the permit process, and will develop proposals for streamlining this process to stimulate investment in food discards composting, should FDEP choose to do so.

Overcoming obstacles to recycling/waste reduction in new or innovative ways.

- ***Compost Markets (Value).*** Compost is a historically low priced commodity in Florida. Because of this, many operators minimize investment in composting and sell inferior, typically un-finished materials. These poor products compound market disinterest in compost. We overcome this obstacle by creating a compost that is more beneficial to end-users' horticultural needs.
 - ✓ This project utilizes food with urban plant debris, to create a finished product with more nutritional value than yard trash compost.

- ✓ Vermi-composting will be used to “finish” the composting process. Worms have a way of improving the value of compost for plants, and vermi-compost and worm castings command a premium price.
 - **Overcoming Collection Challenges.** Two of the major obstacles to food discards management is the limitation on collection infrastructure and failure to integrate collection strategies.
 - ✓ The project also implements an innovative collection system for collecting compostable food discards, focusing on transportation efficiencies.
 - ✓ The project will evaluate composting food discards at the generator’s site (its origin), and transporting partially-composted materials. It is anticipated this will reduce odors, volume, and weight of materials that need to be transported.
 - **Programmatic Obstacles.** The Project Team will seek guidance from the Florida Organics Recycling Center of Excellence (FORCE) and other existing resources to build off existing knowledge and to avoid making mistakes demonstrated by previous organics recycling projects. Areas of innovation include demonstration of new composting recipes using food discards and urban plant debris, implementation of original management strategies, and use of non-traditional carbon sources. Innovative demonstrations will include:
 - ✓ Recipes. Source separated food composting has been limited by lack of knowledge about recipe formation. Recipes are the proportional combination of several materials to make a mixture of materials that has the chemical and physical characteristics to promote optimal decomposition by aerobic organisms and to avoid malodorous emissions. The project will develop recipes that incorporate unique materials (e.g. wax cardboard, which has only been co-composted with food waste on a limited basis in Florida). Furthermore, all recipes will be shared through the project’s web site, and in presentations at industry events.
 - ✓ Proper Daily Management The management of food discards through composting and vermi-composting has been attempted many times before. Odor suppression, which will be address by all proposed systems, is the key obstacle to expanded composting. To avoid odor generation, the project will demonstrate specialized aeration equipment (such as innovative turners and a modified passive/active aerated static pile), mobile small-scale in-vessel composting systems, and vermi-composting.
 - **Harvesting Worm Castings** is a challenge because you do not want to harvest your worms with your castings, and you do not want to disturb your worms while they are actively working the material. To overcome this challenge, we will lease a specialized castings extractor that allows worm castings to be removed from the system without harvesting worms. It is hoped this will increase operational efficiency. The process also results in increased aeration of the worm beds.
 - **Odor Suppression.** Odor has been the primary cause of composting operation failure. The Project Team will build on the successes of the Massachusetts and Vermont food discards composting projects, which have been lauded by the Environmental Protection Agency as model projects that are market based, low technology, and cost-effective.
 - **Quality Assurance.** The Project Team will overcome concerns about compost quality by testing finished product for quality, including nutrient analysis, compost maturity, problem metals, and pathogens. The Florida Organic Growers Association (FOG) is interested in participating in the project to help clarify if the project can produce compost from municipally generated organic discards that meets the stringent requirements of this environmentally oriented group.
- Both the overall approach and system components apply novel approaches and new technologies to overcome obstacles to effectively manage food discards. The project will provide the most comprehensive and integrated food discard management system ever implemented in Florida.

Environmental and Economic Benefits and Cost effectiveness.

Environmental benefits

Because the project is built on a food management hierarchy, the embodied energy of the food is captured on all levels, and materials can be used in their highest and best use. Embodied energy represents all the environmental and economic inputs required to bring a product into being.

Methodology.

- ***Source Reduction.*** People do not eat “recycled” food, thus this project is source reduction at its core. Each item that can be diverted to use as food-for-people has the greatest environmental impact, because this food has already been produced to the point of readiness for human consumption. Thus all the production, transportation, and distribution impacts are already embodied in the item. In a holistic sense, providing food for people has a great environmental return, as well, because providing food for people responds to a basic human condition, and fulfills the need for fresh nourishment. The *Food for Animals* program also provides source-reduction.
- ***Green House/Global Warming Gas Reductions.*** Using EPA guidance, the Project will be among the first in the nation to quantify diversion in terms of preventing/offsetting the production of global warming gasses. The composting component will reduce greenhouse gas production by approximately 800 metric ton carbon equivalents (MTCE) annually, based on the designed capacity of 50-60 tons per week of food discards.
- ***Energy Innovation (Pollution Prevention).*** The Project Team plans to utilize solar power generation options for operating the in-vessel system. This would enable the mobile in-vessel system to be operated without electrical hook-ups or noise generation. Further, it allows the system to operate without generating greenhouse gas emissions or pollution.

Toxicity/Hazards.

Composting food discards aerobically can result in many environmental toxicity benefits by reducing the chemical reactions that occur as food discards break down in landfills and other waste treatment systems. Composting results in **reductions in:**

- ***Methane generation.*** Methane is a flammable gas that must be managed when generated.
- ***Leachate generation.*** Leachate generated in landfills must be treated and disposed of properly.
- ***Odors and Leachate*** in solid waste compactors and dumpsters, where health concerns can arise.
- ***Vermin/vectors*** at waste management facilities, e.g., landfills, due to reduced food attractants.

Economic Benefits

- ***Jobs.*** Composting facilities employ four times more people on a per-ton basis than landfills (WasteCap Wisconsin). The Sarasota project will create two to three new permanent full-time jobs, will be replicable, and will demonstrate economic feasibility of commercial food discard composting and vermi-composting.
- ***Decreased Generator Costs.*** The project aims to reduce generator costs by \$20 - \$40 per ton (depending on internal costs to perform source separation).
- ***Commercialization of Source-Separated Organics Management.*** The project plans a market-based approach to assure on-going success. This includes a tip fee for the compost operator, disposal savings for the generator, and compensation to the hauler. An anticipated tip fee of \$20/ton is \$44/ton below County landfill tip fees. In addition, the proposed facility location is within seven miles of approximately 60% of the County’s population.

- **Low Cost Animal Feed.** Two of 16 Publix Stores currently source separate material for farmers. The project will analyze why these arrangements are effective and permitted, and build on this success to encourage other stores (both Publix and other supermarket chains) to support this end-use. The Project Team is mindful of the changing regulations in this component, and has limited the scope and extent of dependence on this sector to utilize food discards.
- ✓ **Food Pelletization.** The concept of pelletization and other value-added preparation will be considered. However, the Project Team is aware that, most currently operating food-to-feed pelletization programs require a minimum of 80 to 150 tons per day to be economically feasible, and multi-million dollar infrastructure development. Such a facility is beyond the scope of this proposal. Currently, the Team is aware of only one jurisdiction considering this technology: Reedy Creek, which is home to Disney World and related Theme Parks. While there is much to learn from Reedy Creek's experiences, the Project Team believes that the collection infrastructure issues facing medium sized counties require further innovation to be cost effective.
- **Building Community Value:** The project will serve the community by partnering with and incubating community entrepreneurs in the manufacture and sale of worms, worm castings, and compost as a value-added soil amendments. Whereas bulk yard waste compost has a retail value of \$0 plus shipping to \$15.00, delivered, per cubic yard, worm castings are sold for up to \$ 2.00 per lb. in small quantities or by bulk at approximately \$35.00 to \$70.00 per cubic yard.

Cost-effectiveness

- **Food Value.** Diversion of approximately 600,000 lb. of perishable food for people, holds a value of approximately \$1,008,000.00 (per All Faiths Food Bank average grocery food values), and will provide approximately 350,000 to 400,000 meals to area residents in need.
- **Feed Value.** Diversion of approximately 10,000 lb. of perishable food for animals will result in approximately 100 lb. of meat donated to area food banks. Thus the market value of this component alone effectively provides a two-to-three-fold return on investment.
- **Cost Avoidance.** Composting and Vermi-composting will result in annual cost avoidance of approximately \$114,400.00. Thus the payback for this component of the hierarchy is 3.0 years at the initially anticipated rate of diversion, not including compost sales.
- **Compost Market.** Quality compost will be produced which we anticipate will have a market value of \$20 to \$40 per ton (\$8 to \$20 per cubic yard), or about \$50,000.00 to \$100,000.00 per year. This profit level is sufficient to attract the private sector to continue the project after the grant period.
- **Co-Collection Efficiencies.** Current systems require farmers to make “milk-run” collections at multiple locations. By aggregating fresh food for animals, participant farmers will be able to reduce transportation costs.
- **Worms,** Vermi-compost has a retail value of \$100+/ton in some areas of the country. However, these prices have not been paid in Florida. Part of the challenge is developing these compost markets. We are sharing information with the Florida Organic Growers Association (FOG) and will be field testing compost products on FOG member farms in the area. We also plan to send compost samples to The Organic Materials Review Institute (OMRI) to have the project's product certified for use in organic agriculture. These activities are anticipated to increase the value and cost effectiveness of the project.
- **Onsite Composting.** We will compare the cost of a small-scale in-vessel system used at the generator's site to the total cost for centralized processing. We anticipate both savings to the generator and environmental benefits through this model. Current research indicates that the

majority of odor is produced during the first two weeks of composting. Therefore, on-site composting could have a significant impact on odor reduction. Additional potential benefits include: reduction in the weight and volume of materials that need to be managed, increased stability of materials that must be handled, and more cost-effective transportation of residue.

- ***Coordination with FORCE.*** The project will coordinate with FORCE, to maximize efficiency of project, streamline program implementation, add to the existing body of knowledge on composting, and replicate trials, as appropriate, to demonstrate commercialization of University scale research.
- ***Innovative low-tech solutions.*** Not all communities will be able to afford large scale in-vessel composting systems. Therefore, this project focuses on low technology solutions to odor suppression and management. We will evaluate the combination of a low capital investment strategy with a low labor strategy by focusing on recipe mixtures that include structure to promote airflow.
- ***Sustainability.*** Because Sarasota County is popular as a resort and retirement destination, there are numerous restaurants in the County. Six schools, the county courthouse, jail, and hospital are all located within several miles of the site. Overall, it is safe to say that there is a greater supply available to the program of commercial and institutional food residuals than the design capacity. Therefore, the program shall be sustainable beyond the project year, and all partners are committed to continuing the project if proven economically viable.

Transferability

Technology & processes.

The project is highly transferable to other locales throughout the state. All counties generate food discards, and nine to ten have or could benefit from a food bank. Virtually all counties have farms, and locations available for composting. The equipment to be utilized is commercially available, although not currently utilized in Florida.

The project will produce educational materials on preparing food discards for use in a food hierarchy (multi-language). These materials will be immediately available throughout the Publix Supermarkets chain, and will be readily transferable to other grocery chains (significant interest has been indicated by at least one other major chain, although a letter of commitment was not received in time for inclusion in this grant application).

Infrastructure Development. The Team notes that the collection infrastructure that this project will develop can be duplicated and used as a model and/or expansion point for developing a feed manufacturing system in Sarasota County, or other counties in the future.

Project results, including recipe information, collection structure, and permit information will be compiled in a series of documents that will be readily available, and will be posted on the Internet (see below).

Promotion of transferability.

The Project Team will add pages to Florida's Online Composting Center (www.compostinfo.com) to disseminate information on the project. We will include sections to include the following:

- Discussion of the Food Discards Hierarchy program and guidance on setting up a program based on this project's experience.
- Food for People. Listing resources for food banks and people seeking to support food banks.
- Food for Animals. Discussing health and other issues, markets, processes, new technology, and opportunities to expand programs.
- Food for Plants – composting. Specific guidance on commercial food discards composting, permitting requirements, setting up collection routes, operational issues, and equipment specifications based on our project's experience. Discussion of small-scale in-vessel systems use for onsite management vs. centralized facilities.
- Food for Plants – vermi-composting. Specific guidance on commercial food discards vermi-composting, permitting requirements, options for collecting material, operational issues, and equipment specifications based on our project's experience.

The Project Team will also promote the program through the following methods:

- Work with Recycle Florida Today - FORA division to disseminate information to the Florida organics recycling industry.
- Author at least two articles on the project and seek publication in state and national forums.
- Seek to present at annual conferences within the recycling industry including: Recycle Florida Today, Solid Waste Association of North America, and/or the National Recycling Coalition.

Local Support

The Project Team has assembled interest and commitments from generators, haulers, processors, and end markets, and has leveraged in-kind contributions of \$488,700, of \$1,025,520 total budget, a 48% match. The Project Team is actively seeking additional donations valued at \$30,000 to \$50,000, but which is not reflected in the project budget. An additional contribution of \$50,000 would result in a 52% match. The project intends to make cost-effective use of resources by leveraging the local expertise and donations.

Project Partners, and Explanation of Local Matching Funds.

Sarasota County. The County has committed \$20,000 to assist with facilitation, development, implementation, and promotion of the project (\$10,000 for each year of the project). These funds are distributed among several in-kind match categories, and generally includes staff time, reproduction/printing costs, postage, and miscellaneous expenses. The county will also donate ground urban plant debris, valued at approximately \$93,000 (200 cubic yards per week @ \$9.00 per yard delivered). *Ownership of any equipment purchased through this grant will comply with Florida Statutes guidelines on the use of grant funding.*

All Faiths Food Bank (AFFB). The project will fund a refrigerated truck for AFFB to support the food-for-people. AFFB will implement the food discards hierarchy program with expert subcontractors and maintain the food-for-people program for a minimum of five years. AFFB will be contributing approximately \$85,000 in-kind support, for annual operational and maintenance costs on the truck, hiring a dedicated driver, and staff support time (two years).

Publix Supermarkets (Publix). Publix will be taking a lead both on developing educational materials, and in developing the food-for-animals program, utilizing an existing network of supporters. Publix will be contributing staff time valued at approximately \$9,500, and purchase of specialized containers for the project (value undetermined).

Byron and Lou Crofut. The Crofuts will be taking a lead in the food-for-plants program. Their contributions to the project include donating land for siting the operation valued at \$2,500 per month (\$30,000 for one year operation, note that land in the area is selling for \$100,000 per acre). Equipment valued at \$800,000 (we estimate it would cost us \$80,000 to lease this donated equipment for the project period). As well as personnel time valued at approximately \$15,000.

Vermitechnology Unlimited. Vermitechnology Unlimited will be donating staff time for program implementation, training, and marketing (of end product) valued at approximately \$12,700.

Resource Management Group, Inc (RMG). RMG will be donating consulting staff time for program implementation, training, and marketing (of end product) valued at approximately \$22,500.

The food-for-plants program will require participants to pay for collection service and collection containers. During the grant period, private investment will match the grant funds on a dollar-for-dollar basis. After the grant year, the program participants will pay the full cost of collection and processing. This allows our program to offer participants in the first year of operation price incentive to participate while the system is being developed. It also provides us with a year of real cost data on which to base fees after the grant year.

Budget

Description	Cost	In Kind	Request	Timeline – Work Period in which activities will occur									
				1	2	3	4	5	6	7	8		
Food for People program													
Refridgerated Collection Truck	\$ 75,000	\$ 10,000	\$ 65,000	x	x	x	x	x	x	x	x	x	x
Outreach to Stores, Educational Materials	9,500	6,000	3,500	x	x		x		x				x
Driver	70,000	70,000	-	x	x	x	x	x	x	x	x	x	x
Food for Animals program													
Refridgerated Collection Truck (co-collected w/Food for People)	-	-	-	x	x	x	x	x	x	x	x	x	x
Outreach to Farms, Educational Materials	6,500	2,500	4,000		x		x		x				x
Outreach to Stores, Educational Materials	10,500	6,000	4,500		x		x		x				x
Food for Plants (composting) program													
Facility design and Permitting	51,100	9,500	41,600	x	x	x	x						
Operator Training	14,200	9,100	5,100				x	x	x	x			
Design collection route, market generators	12,480	-	12,480			x	x	x	x	x	x	x	x
Collection and Tip Fees	187,200	93,600	93,600					x	x	x	x	x	x
Collection container rental	23,400	11,700	11,700					x	x	x	x	x	x
Education/training of generators	18,100	7,700	10,400				x	x	x	x	x	x	x
Composting Pad (fill material)	12,500	-	12,500				x						
Composting Pad (transporting fill)	12,500	2,500	10,000				x						
Composting Pad (site preparation)	15,000	5,000	10,000				x						
Composting Site Misc. Improvements	5,000	2,500	2,500				x	x	x	x	x	x	x
Composting Equipment**** (lease)	110,000	80,000	30,000					x	x	x	x	x	x
Operator Compensation	15,600	-	15,600					x	x	x	x	x	x
In-Vessel System	30,000	-	30,000			x	x	x	x	x	x	x	x
Ground Urban Plant Debris	93,600	93,600	-					x	x	x	x	x	x
Sampling and analysis	6,400	1,400	5,000							x	x	x	x
Marketing Product	8,600	7,600	1,000									x	x
Screening	500	500	-									x	x
Lease Land	30,000	30,000	-				x	x	x	x	x	x	x
Insurance	4,000	-	4,000				x	x	x	x	x	x	x
Food for Plants (Vermi-composting) prog.													
Design, and Permitting	16,500	5,300	11,200	x	x	x	x	x					
Operator Training	10,300	5,200	5,100				x		x				x
Vermi-Composting Equipment	110,500	6,500	104,000				x	x	x	x	x	x	x
Operator Compensation	15,600	-	15,600					x	x	x	x	x	x
Horse Manure	3,000	3,000	-					x	x	x	x	x	x
Marketing Product	8,500	8,500	-									x	x
Worms	15,000	-	15,000					x	x				
Reporting, Dissemination of Information, Administration	24,440	11,000	13,440	x	x	x	x	x	x	x	x	x	x
Total	1,025,520	488,700	536,820										

Full Funding is required to fund all components of this project and to fully leverage local support.

Budget Notes: Our request has increased by approximately \$7,000, which reflects *increases* of \$1,000 for the food-for-people outreach and \$15,600 for operator for composting, and *decreases* of \$500 for food-for-animals outreach, \$4,000 for vermi-composting equipment, and \$5,000 for worms. Our overall budget increased from the pre-proposal, primarily through identifying additional sources of in-kind contributions through local support, and confirming the value of services to be contributed. The project assumes that permitting will take six months to a year, and will begin tasks earlier if the permitting process goes more quickly. We have already contacted the local FDEP office to begin establishing a working relationship.