2004-05 INNOVATIVE GRANT APPLICATION FORM

Project Information (on applicant letterhead)

1) **Applicant Name:** Leon County

2) **Primary contact person:** Nancy Paul

3) **Complete Address:** 7550 Apalachee Parkway

Tallahassee, FL 32311

4) **Telephone Number(s) (including SunCom number):** (850) 414-9346

5) **E-mail address:** PaulN@mail.co.leon.fl.us

6) **Project Title:** Use of Processed Fluorescent Tube Glass and Other Glass Cullet in the Manufacture of Concrete Products

7) **Grant Request Amount:** $150,000

8) **Length of project (months):** 12 months

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Authorizing Signature

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Title

PROJECT ABSTRACT:

This project will collect, process and use fluorescent tube glass (FTG) and other container glass from Leon and surrounding counties to replace virgin materials now used in the production of concrete products at CDS Manufacturing, Inc (CDS) in Quincy, Florida, 20 miles west of Tallahassee. Grant funds requested ($150,000) will be used to purchase equipment to create local markets for used glass in Leon and surrounding counties as well as to decrease the need for and use of virgin materials (i.e., concrete aggregates) in the manufacture of new and existing product lines at CDS.

The primary focus of the project is the use of FTG (in concrete products) which is currently stockpiled at the Leon County landfill after the extraction of hazardous mercury by Onyx Special Services (Onyx). Onyx is a statewide mercury reclaimation processing facility located in Tallahassee. Onyx receives FTG and street lamp glass at their Tallahassee plant from TECO, Florida Power, Gulf Power, City of Tallahassee, other Florida utilities and private sector businesses. Leon County takes approximately 1,800 tons of this material annually at the landfill. The surrounding counties of Jefferson, Wakulla, and Gadsden also currently have few or no end markets for their collected container glass.

The successful outcome of this project will provide Leon and surrounding counties markets for container and FTG glass. As an established manufacturer of pre-cast concrete products and the most recently approval to construct a concrete batch plant, CDS will be using these types of glass in their production process. Specifically, the glass will be used in the manufacture of architectural pre-cast concrete, underground vaults/septic tanks, stormwater/sanitary pre-cast and cast-in-place concrete.

PROJECT DESCRIPTION

The goal of this project is the formation of a partnership between Leon County, Onyx, and CDS to provide a local end-use market for used and processed fluorescent tube glass and other container glass by reducing the tonnage of this material being stockpiled and diverting it into the construction materials industry.

Recycling processors are prohibited from landfilling recycled materials. This project will create new, innovative and beneficial uses for glass cullet and FTG. In a period where the uses of glass cullet are diminishing, as traditional feedstock for the glass industry, this project is critical to sustaining curbside and drop-off recycling programs statewide. This project will create new local markets for local governments' glass and satisfy Leon County's issue of landfilling FTG.

Fluorescent tube glass, because of its mercury content, is considered a universal waste in Florida. Currently, this material is collected from various locations in Florida and processed by Onyx in Tallahassee to remove the mercury. The recovered or separated mercury is shipped out of state for reuse while the non-hazardous glass is sent to the Leon County. Much of this glass had been used as road base and cover material at the Class I portion of the County's landfill. However, now the County has opened it's new transfer station and the County's Class I landfill is being closed. Another use for this glass must be found. Approximately 1,800 tons of this type of glass has historically been used at the Leon County landfill annually. In addition to FTG, used glass containers make up approximately 6-7% of Florida's MSW waste stream on a weight basis. End markets for container glass (for recycling into new glass containers) has become increasingly difficult because of the shut-down of several glass manufacturing plants in Florida and because of the expense involved in transporting this waste stream over long distances.

This project will establish a collection and processing operation in Leon and surrounding counties for both FTG and mixed glass cullet to supply a high-volume demand created by CDS in their manufacture of pre-cast and cast-in-place concrete products. Spent fluorescent tubes, generated statewide and shipped to Onyx in Tallahassee for mercury removal, will be collected and processed by Onyx. CDS will take the processed glass from Onyx to be used as replacement of certain aggregates (mostly sand) currently used in their production process. In addition, other mixed glass cullet will be collected from Leon and surrounding counties for the same purpose.

CDS is a Florida-based company (Quincy, Florida in Gadsden County, 20 miles west of Tallahassee) that began it's operations in 1995 and is currently manufacturing and marketing numerous products that contain recycled material content. CDS is a willing partner in the recycling industry and is continuously working to promote the importance of using recycled materials in the pre-cast and concrete industry. Furthermore, CDS has recognized that this technology is readily available and easily incorporated by concrete batch plants throughout the state of Florida. It is the objective of CDS to develop concrete mix designs using these glasses as aggregates and demonstrate to it's industry peers that these mix designs meet architectural and structural specifications and therefore should be considered to be universally accepted as an industry standard.

Should the project be a success in terms of producing a product containing recycled content glass that meets construction standards for concrete products, it's results could be transferable to virtually every county in the State that has a concrete batch plant and thus provide local markets for at least some of the relatively large amounts of glass now being landfilled in Florida because of the lack of such markets.

Criteria 1: TECHNOLOGIES

Sub-criteria 1 – Not in common use in Florida

The use of mixed glass cullet in concrete products has been recently established as a use in architectural pre-cast concrete, but has not been used in a high volume environment as would be required by a concrete batch plant. Onyx Special Services has stated they are not aware of the use of fluorescent tube glass in concrete products anywhere in Florida.

Sub-criteria 2 – Novel application of an existing technology or process.

This project is novel in that it proposes to utilize existing and common technology to provide a local market for processed (that is, non-hazardous) fluorescent tube glass and glass cullet. It is also novel in that there is already a large commercial market for the products (architectural pre-cast concrete, underground vaults/septic tanks, stormwater/sanitary pre-cast and cast-in-place concrete).

The project will demonstrate the technical feasibility of using non-hazardous glass materials (processed fluorescent tubes and mixed glass cullet) to replace virgin materials in the production of residential and commercial construction concrete applications.

Sub-criteria 3 – Overcoming obstacles to recycling/waste reduction in new or innovative ways

The obstacles being addressed by this project include:

- Demonstrating the technical soundness of using a non-hazardous waste material in the production of residential and commercial/institutional construction applications (i.e. concrete) has not been done before.
- Demonstrating the use of FTG in concrete products will provide a market for glass that will allow Onyx to hold pricing for their hazardous waste abatement services thereby passing the savings on to their customers statewide. This has the potential to reduce illegal dumping of fluorescent tubes that would release mercury into the environment.
- The lack of close-by or any available markets for either FTG or mixed glass cullet.
- Provision of another recycled content product for purchase by both governmental and private sector entities.

The project helps to overcome the above outlined obstacles by:

- Providing local (i.e., only 20 miles from Tallahassee/Leon County) markets for two materials that do not currently have end use markets in the area. Indeed, with the closing of the Leon County Class I landfill operation and the transfer of Class I waste from Leon County to Jackson County, the transportation and disposal of waste glass material, including the processed fluorescent tubes, is becoming more expensive and problematic.

Criteria 2: TARGETS

Both fluorescent tube glass and container class are generated by commercial/institutional entities. The FDEP has targeted commercial/institutional waste for this round of innovative grants.

The fluorescent tube glass now being generated on a statewide basis and collected by Onyx in Tallahassee. Without assistance from this project, FTG will be landfilled at additional costs to Onyx instead of being recovered and used in the manufacturing of another product.

Container glass is currently a very difficult material to recycle in the Leon and surrounding county area because of prohibitive distances to end use markets that make their transportation too expensive for recovery. This project would also help alleviate this condition by providing a local market for some of the area's container glass.

Criteria 3: BENEFITS

Sub-criteria 1 - Environmental Benefits (15 points)

- Methodology

This project will enhance resource conservation through the reduced use of virgin materials in the manufacture of existing and newly developing product lines at CDS, as well as increase recycling in Leon and surrounding counties of a waste stream (estimated at 1,800 tons/year) that currently is being stockpiled at Leon County's landfill**.** The project will also provide a market for mixed glass cullet being stockpiled by the County's recycling contractor. It is expected that 500-800 tons of both fluorescent and container glass could be processed and used in concrete products. Currently, CDS is pouring approximately 856 tons of concrete every month. Of this number, 71% (607 tons) represents coarse and fine aggregates. The initial estimates for concrete tonnage used in their batch plant would be 6,000 tons per month (4,260 tons of aggregate). **The fluorescent tube and other glass cullet is an ideal substitute to replace (in part) these virgin aggregates**. This grant will allow CDS the resources to develop concrete mix designs that would maximize tonnages of glass used while maintaining strength and other structural performance specifications.

- Toxicity

Toxicity is rated very low due to the environmental controls employed by and required of Onyx. They provide regular TCLP test results to Leon County for monitoring of the FTG.

Sub-criteria 2 – Economic Benefits (10 Points)

This project will lead to (at a minimum) one full time sales person and four full-time casting positions with CDS. It will also enable CDS to increase the products they currently offer under the product name CDS "Green Stone"®. Onyx will not incur tipping fees for disposal of their glass and the additional transportation to the regional landfill Leon County uses. Additionally, commercial/institutional sectors will avoid increased costs ultimately passed on to them by Onyx should they incur increased tipping fees.

Sub-criteria 3 – Cost Effectiveness (10 Points) Includes, but not limited to cost reduction, payback period, sustainability, and cost-effectiveness.

- This project will improve market economics for a waste material (fluorescent glass and container glass).
- This project will be self-sustaining should this project demonstrate the technical feasibility of using recovered materials in the manufacturing process.
- The overall costs of recycling and waste reduction could be substantially reduced on a **statewide** basis using this project as a "model" for other rural and urban communities.

Criteria 4: TRANSFERABILITY

Sub-criteria 1 – Transferability of technology and processes (5 points)

This project will be easily transferable to any county within the state that has a pre-cast facility and/or concrete batch plant and access to glass. Project results will also be "transferred" through an existing network of economic development, trade and recycling organizations in the State.

The environmental and economic benefits outlined earlier in this proposal could also be easily "transferred" to other jurisdictions throughout the State that are interested in investigating natural "matches" of manufacturers that use certain virgin materials for which recyclable materials (generated by residents and businesses throughout the State) could be substituted.

Sub-criteria 2 – How project will promote transferability (5 points)

SWIX, Leon County, Onyx and CDS will promote the "transferability" of this project by coordinating outreach with Enterprise Florida, Inc. (the State's Economic Development entity) and regional Economic Development Councils that are made up of local businesses throughout the State. The presentation of findings and results of this project to these groups will provide businesses/manufacturers and local governments throughout Florida with valuable information about how feedstock substitution utilizing the partnership of a local manufacturer and local government could work for their jurisdictions. In addition, SWIX, CDS, Onyx and Leon County will team up to provide brief workshops and written materials about the project to interest groups like FDEP, Florida Sunshine Chapter of SWANA, Florida RFT, and local/regional economic development councils.

Essential to technology transfer will be a compilation of a case study designed to outline the steps taken in establishing this particular public/private partnership as well as suggested resources that would benefit such a program in other areas. In addition, web sites will be targeted to assist with program dissemination and to provide links to the primary site that will have detailed information about the project. Potential partners in the web site information sharing will include SWIX, Leon County, RFT, SWANA, FDEP, CDS, and regional or local economic development councils throughout the State. Information exchange will be encouraged through the pursuit of article placement in recycling publications in the state such as the RFT newsletter, national trade journals and publications, and appropriate business and economic development journals. Furthermore, CDS will independently promote this technology through industry trade publications and state industry associations.

Summary of project transferability activities:

- Two presentations to Statewide interest groups (public and private sector) on project "background" and "how to" information.
- Case study compilation for use in workshops, presentations, and web sites.
- Web site posting of all information/reports related to this project by SWIX, FDEP, local and regional economic development councils, RFT, SWANA.
- Trade journal articles about project.

Criteria 5: LOCAL SUPPORT

The total requested grant funding for this project is $150,000. The project will generate matching (i.e., cash and in-kind contributions) of about 44% (see budget sheet attached). CDS Manufacturing is responsible for a majority of these in-kind and cash matching funds since this private sector company stands to benefit the most from a successful project that would enable CDS to continue to displace virgin raw materials through recycled content input for existing and newly developing product lines.

Leon County, Onyx and SWIX are contributing significant labor hours and transportation assets as in-kind matches for the project.