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6) Grant Request Amount:	$200,000
7) Project Timeline:	12 Months

GEOHAY™

PROJECT ABSTRACT

In January of 2002 the carpet industry and several state government/quasi-governmental agencies signed the Memorandum of Understanding for Carpet Stewardship (MOU). The MOU is a form of extended producer responsibility that commits the carpet industry to work toward reaching a 20-25 percent recycling rate (27-34 percent landfill diversion rate) by 2012. This is a challenging goal because the current national recycling rate for carpets is less than 4 percent. In order for the carpet industry to meet the goals of the MOU it needs support in building recovery and market infrastructures for carpets.

Over the last several years the State of Florida funded two Innovative Recycling Grant projects for carpets in an attempt to facilitate diversion of part of the 130,000 tons of carpets are disposed in the state each year. Both projects were groundbreaking in that they evaluated the costs and effectiveness of various methods of diverting carpets from the waste stream. However, both projects ultimately experienced difficulties related to limited markets for recovered carpets and neither are currently diverting carpets from the waste stream. In particular, the August 2001 "temporary" shutdown of the world's largest carpet recycler, Evergreen Nylon Recycling LLC (Augusta, GA), created a great setback to increasing carpet recovery. The plant has yet to reopen.

Okaloosa County proposes to address the lack of markets for post-consumer carpets by incubating a Florida-based end market for recovered carpets through the Innovative Grant Program. GeoHay™ is an erosion/stormwater control product that is made from recycled synthetic fibers. Currently, Mary Ann Industries (Villa Rica, GA) manufactures GeoHay™ with pre-consumer recycled fibers under license from the patent holder for the product, who is a resident of Okaloosa County, Florida. For the immediate future, Mary Ann Industries does not intend to replace pre-consumer fibers with post-consumer carpet fibers at its manufacturing plant.

GeoHay™ is a proven product and Mary Ann Industries is thriving as sales of GeoHay™ are expanding nationwide. With the support of Okaloosa County and leverage of Innovative Grant funds, the patent holder would have sufficient resources available to open a manufacturing plant in Okaloosa County, providing for additional production capacity for GeoHay™ to meet increasing demand. A portion of the processing equipment would be purchased using Innovative Recycling Grant funds and leased from Okaloosa County until the equipment is depreciated. Unlike Mary Ann Industries, this production facility intends to consume significant amounts of shredded post-consumer carpet and the facility would ensure that a Florida market exists for recovered Florida carpets.

The scope of work for this project will consists of 3 primary tasks.

Task 1: Locate and Equip a Manufacturing Facility

This task entails locating and entering into a lease for a manufacturing facility. Okaloosa County has been selected as the location of the facility for the following reasons:

1. **Transportation access.** One of the nation's primary East-West interstate highways, I-10, crosses through Okaloosa County.
2. **Production cost.** Because of its relatively low population density, land is inexpensive, which results in comparatively low lease prices compared to other locations. Furthermore, because of Okaloosa County's low cost of living, inexpensive labor is readily available.
3. **Market proximity**. As the fourth most populous state in the country, Florida has the potential to supply large amounts of recovered carpets to the proposed manufacturing facility. Furthermore, Okaloosa County is well-situated for supplying GeoHay™ to both Florida and a rapidly growing major market for the product, Texas.

An existing metal building facility will be located and leased. Minimum requirements for the facility include a loading dock, office area, and suitable plant floor space for a minimum of one manufacturing line. Buildings with the flexibility to add additional future processing lines will be preferred.

The building will be outfitted with equipment to manufacture GeoHay™ from shredded post-consumer carpet. Equipment lease options, where available, will be preferred over equipment purchases during the period of this grant request. A carpet shredder will not be installed at the facility during the grant period because its throughput and expense are greater than required by the initial facility business plan. During the period of the grant Columbia Recycling Corp. (Dalton, GA) will shred and ship post-consumer Florida carpet to the facility. Long-term plans include purchasing a shredder and adding additional GeoHay™ processing lines.

Task 2: Establish Market Relations with Communities, Private Collectors, and RMPFs

Okaloosa and Leon Counties have already stated their intention to implement collection programs for post-consumer carpets if this proposal is funded. Outreach efforts will also be made to other Florida counties, communities, and state agencies in order to increase the supply of material to the plant. Furthermore, operators of private collection programs and RMPFs will be contacted in order to develop suppliers to the plant. Unlike previous collection programs that were evaluated in Florida, there will be no requirement for collectors or processors to sort carpets by type – this will greatly decrease the expense of local recovery programs. All broadloom carpets (not just nylon) will be accepted and recycled into GeoHay.™

Task 3: Convert Carpet to GeoHay™

GeoHay™ production will begin after equipment installation – initial plant feedstock requirements will be met with pre-consumer fiber as post-consumer recovery programs ramp up.

Task 4: Report and Technology Transfer

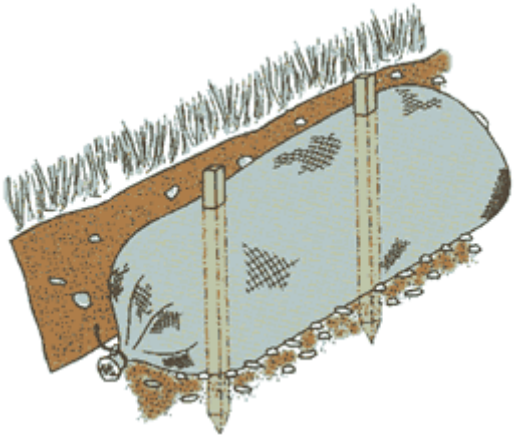
Quarterly and final reports will be prepared. Technical assistance will be made available to collection program sponsors/operators in order to guarantee diversion program success.

GeoHay™ is a novel, patented product that is recycled and manufactured through an innovative process.

GeoHay™ is made from 100 percent recycled materials. Although the GeoHay™ that is currently is on the market is made from pre-consumer fibers, this proposed project will manufacture GeoHay™ using post-consumer fibers from recycled Florida carpets. This is a new and uncommon use.

GeoHay™ is a substitute for staked hay bales and silt fences that are normally used to meet the permit requirements for temporary erosion control that at construction sites. Temporary erosion controls are required in order to reduce stormwater runoff and keep sediments in construction site stormwater from increasing the turbidity of surface water. GeoHay™ works by allowing water to flow through its structure while trapping suspended sediments. Unlike hay bales, GeoHay™ is reusable and doesn't fall apart or decompose with use. GeoHay™ is made from inert materials and is environmentally safe. It is competitively priced with and outperforms alternative temporary erosion control products.

GeoHay™ is made by shredding synthetic fiber products. The shredded fibers are then packed into a woven geotextile fabric that is cut and shaped into a cylinder, which can be made to varying lengths. Holes for wooden stakes are part of the design of GeoHay,™ which keeps GeoHay™ in place after installation. Shown below is a drawing of GeoHay™:



Virtually all other processes for recycling carpets require that they be separated by face fiber type (e.g., nylon 6, nylon 66, olefin, polyester) because of the chemical and/or thermal recycling processes that are involved in returning them to beneficial use. Other recycling markets normally only desire the two types of nylon carpets, which make up no more than 70 percent of post-consumer carpets that are generated. Furthermore, because the face fiber of broadloom carpets normally composes less than half the weight of a carpet, the actual recycling yield of diverted materials if often less than 35 percent of all carpets segregated for intended recycling. The GeoHay™ recycling process and product is innovative in that it will recycle all broadloom carpets that are diverted for recycling, including both woven backing materials and the face fiber.

Virtually all other carpet collection programs are privately operated by commercial contract installations (e.g., DuPont's program). This program is innovative in that it encourages the partnership of public sector recycling coordinators and targets carpets that are generated from commercial as well as residential replacement jobs. All programs of this type are thought to have stopped after the Evergreen Nylon plant closure, so this approach is innovative and not in common use.

Specific obstacles that will be overcome include:

1. Cost effectiveness of recovery programs – recovery program cost is significantly reduced by not requiring collectors to sort carpets by type using sophisticated identification equipment. Also, because all carpets that are collected are marketable, there is no disposal expense associated with carpet face fiber types that are not in strong demand. This project will recommend that diversion occur through simple tip and bale strategies at RMPFs in order to keep costs down. Tip fee savings over landfill disposal will be a primary economic driver for diversion.

2. Economies of scale – other recycling processes require multi-million dollar capital investments. This requires extremely high diversion quantities in order to obtain the economies of scale associated with high plant utilization that are required to cover the capital and operating expense and keep the plant operational. The GeoHay™ recycling process is much smaller in scale and less capital intensive, allowing for successful economics at much smaller diversion quantities.

3. Process residues – as discussed on the previous page, process residues are virtually non-existent because of the ability to use all carpets of all fiber types.

Normative management of post-consumer carpets in Florida is that removed carpets, whether from residential or commercial/institutional sources, are placed into a roll-off container for collection and transfer to a landfill site. Even for residential carpet replacement jobs, the installer normally returns the carpet to the waste container of the carpet store that sold the replacement job. Class I landfills are the normal disposal site for used carpets, although significant amounts of carpet are generated as part of construction/demolition/renovation activities and are received by C&D landfills (carpets compose from one to five percent of the C&D stream according to studies by the Center for Solid and Hazardous Waste Management).

Because carpets are part of the commercial/institutional waste generation and disposal stream, they are a targeted material as identified in the criteria for the Innovative Grant Program criteria. To the extent that C&D recyclers begin to divert carpet from the C&D stream, carpet can be considered C&D, another targeted material.

ECONOMIC/ENVIRONMENTAL BENEFITS AND COST-EFFECTIVENESS

Environmental Benefits: GeoHay™ provides significant environmental benefits in that it does a superior job in preventing sediment runoff from construction sites compared to alternative products, greatly improving surface water quality. Furthermore, because it is a reusable product it contributes to source reduction compared to the one-time-use alternatives (hay bales and silt fences). Furthermore, because GeoHay™ is made from recycled materials, it contributes to longer landfill life and less consumption of natural resources. Because the recycling process is mechanical and not thermal or chemical, there are no chemical byproducts or volatile organic compounds that are generated as part of the recycling process.

Economic Benefits: The project will generate a minimum of at least eight light-manufacturing jobs in Okaloosa County. Economic developers identify light manufacturing as desirable for local economic growth because of the high multiplier affect those types of jobs have on local economies. It is estimated that at least an equal number of jobs (i.e., more than eight) will be generated throughout the state in order to divert carpet from disposal. Furthermore, this will be a small business that is locally owned and operated in a rural part of the state where good jobs are needed. As the demand for GeoHay™ continues to increase, it is projected that more jobs will be created.

Cost-Effectiveness: The Sarasota County Carpet Recycling Project found that sorting and residue disposal composed from 82-95 percent of the cost local processing of collected carpets. By removing the requirement to sort and dispose of non-nylon carpets, the cost-effectiveness of local processing by a RMPF will be significantly improved. While little or no scrap value can be paid for the baled carpet, the significantly reduced tip fee that would be charged by a RMPF compared to local landfill tip fees (and the time savings with having an in-town tip location versus a remotely located landfill) are expected to provided strong incentives for carpet stores and their waste haulers to divert carpets from disposal. Calculations suggest that a RMPF tip fee of $20 per ton or less should provide a suitable return to RMPF operators. Recovery of polyurethane underlay pad will further increase the cost-effectiveness of processing carpets for RMPFs. Similarly, because the statewide average Class I landfill tip fee is $40 per ton, significant financial incentives will exist to facility diversion.

The intent of this grant request is to provide for seed money to partially equip the manufacturing plant. The patent holder of GeoHay™ will be making a significant investment in excess of this grant request for the rest of the equipment and facility. His full intention is to operating the business in a sustainable and fiscally responsible manner so that GeoHay™ will continue to be manufactured from recovered Florida carpets for years to come. Because of the proven market for GeoHay,™ this proposal is to not be confused with other proposals that may be focused on research and development, and which may not continue after the conclusion of the formal grant project timeline.

The seed money being requested in this proposal will save an estimated $35,000 per year in capital equipment costs. This "payback" or reduction in the cost of production will be immediate and will enable the recycler/manufacturer to offer a more favorable price to local community RMPFs for baled carpet than would otherwise be the case if the full capital cost of the project was privately financed.

This project will emphasize cost reduction throughout the project so that the maximum amount of seed funds can go toward processing equipment. Over 85 percent of the grant request planned for equipment, with the balance being used for miscellaneous expenses and consultant support.

Technology and Process Transferability: Although GeoHay™ is patented and trademarked, technical assistance will be provided to collectors and processors of post-consumer Florida carpets. Because the plant will depend on a reliable supply of material, a strong effort will be made to support local collection programs and share best practices. Promoting the transfer of recovery "technology" is where technology transfer will be emphasized. Because any community and any RMPFs can support the recovery of post-consumer carpets transferring collection and processing best practices to a broad Florida audience will be emphasized.

Means of Technology Transfer: R. W. Beck will be the consultant that will be participating in this project. R. W. Beck was the consultant that worked with Sarasota County on their carpet recovery project, which was a comprehensive analysis of the costs of collecting and processing post-consumer carpets by a variety of mechanisms, including RMPF drop-off and C&D recycler processing. Because of Beck's unmatched background in this area, the quality of information on cost-effective collection will be unmatched. R. W. Beck will be available to provide on-site assistance to communities in implementing their recovery programs. Furthermore, attempts will be made to get on the agenda for a presentation to the RecycleFlorida Today membership at the association's annual conference.

The projects total cost is estimated at $80,000 per year in capital and facility costs. Similarly, labor costs are estimated at $250,000 per year, and utilities and materials costs are estimated at $70,000 per year. The total annual cost is therefore projected to be $400,000, exclusive of Consulting expenses and Okaloosa County grant administrative costs, which would only be incurred during the year of the grant, and which are estimated at $35,000 in total. Because the depreciation life of the equipment is estimated to average 7 years, the total project cost over the life of the equipment would be $2,835,000 (7 times $400,000 plus $35,000).

This proposal is requesting grant funding of $200,000. Because the majority of the grant will go toward capital equipment, the actual effect of the grant will be for the life of the purchased equipment (projected at an average depreciation life of 7 years). Therefore, the amount of matching funds that will be provided is $2,635,000 over the beneficial life of the grant. The percentage of matching funds compared to total project costs is therefore 93%.

BUDGET AND TIMELINE

The total budget for this project is estimated to be $2,835,000 over the initial seven year live of the processing equipment, not including revenues from the sale of GeoHay.™ Only $200,000 is being requested in grant funds. The table below details the proposed expenditure of grant funds:

Task	Administrative [1]	Equipment/ Facility	Operating	Promotion/ Education	Consulting /Technical Assistance	Tasks Totals
1. Locate/Equip Manufacturing Facility		$175,000				$175,000
2. Establish Market Relations					$4,500	$4,500
3. Convert Carpet to GeoHay™					$1,500[2]	$1,500
4. Report and Technology Transfer					$19,000	$19,000
Grant Expenditure Totals	-	$175,000	-	-	$25,000	$200,000
Matching Funds/In-Kind Contribution	$4,500	$385,000[2]	$2,240,000[2]	$4,500	$1,000	$2,635,000[2]

[1] Grant administration expenses.
[2] Accrued over seven years.

Proposed Timeline for Innovative Grant Project

Task/Month	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	Ongoing
1. Locate/Equip Manufacturing Facility	■	■	■	■	■	■												
2. Establish Market Relations			■	■	■	■	■	■	■	■	■							
3. Convert Carpet to GeoHay™							■	■	■	■	■	■	■	■	■	■	■	■
4. Report and Technology Transfer						■	■	■	■	■	■	■	■	■	■	■	■	

As can be seen from the timeline, the locating of a manufacturing facility and ordering of equipment will begin after notification of award yet before the contractual start date of the project. Furthermore, it should be noted that conversion of carpet to GeoHay™ is planned to continue for an extended amount of time given the large amount of matching funds that are to be provided for the project.

R. W. Beck, Inc. will assist in the project as a technical consultant. R. W. Beck has unsurpassed experience in carpet recycling and was the consultant that Sarasota County selected to conduct the Sarasota Carpet Recycling Innovative Grant Project. The full grant is requested in order to provide maximum material revenues to community collection program operators.