

**NORTH CAROLINA
RECYCLING BUSINESS
ASSISTANCE CENTER**

A cooperative effort
of the
N.C. Department of
Environment and
Natural Resources
and the
N.C. Department of
Commerce.

Recycling Works

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Wallboard scrap is "gold" for North Carolina recycler

*By Matt Ewadinger, RBAC Manager,
and Kathleen Gray, Market Development Specialist*

A North Carolina company manufactures value-added products from calcium sulfate (gypsum) reclaimed from wallboard scrap discarded during construction.

Waste Reduction Products Corp. (WRPC), Chatham County's version of King Midas, has turned scrap wallboard into "gold," building a successful recycling company.

WRPC evolved from a study of the construction waste stream commissioned in November 1993 by Research Econometrics in Research Triangle Park.

"The study identified wallboard scrap, also referred to as drywall or sheetrock, as a major component of the construction waste stream that had been overlooked as a reusable material," said Don Evans, director of the study and a founder of WRPC. "The results revealed several

products that could be economically produced from the reclaimed scrap, which led to the incorporation of WRPC on June 16, 1995," said Evans. He recalls the difficulty he experienced convincing builders and their bankers of the study results, which showed that each square foot of construction produces one pound of wallboard scrap.

Diverting scrap from landfills

The WRPC wallboard reclamation system begins with the installation of a

stationary compactor at the point of generation. The closed compactor box collects more than twice as much material as open top containers and protects the wallboard from the weather. WRPC has targeted North Carolina's manufactured housing industry (second in production nationwide) for reclamation services because of the large flow of wallboard scrap generated by mobile and modular home factories.

As WRPC researchers have designed products to be made from wallboard scrap, they also have considered how to change a pattern of behavior that views the material as waste.

(See Gypsum, page 7)



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Scrap tire material grant program announced

Program funding estimated to be \$1 million per year

By John Nelms, RBAC Industrial Development Specialist

DENR's scrap tire management program is initiating a new strategy authorized by the North Carolina General Assembly to encourage scrap tire recycling in the state. DENR is now offering grant funding to support market development for scrap tires. The goal is to make scrap tire recycling sustainable in the state.

Paul Crissman, supervisor of the Special Waste Branch in DENR's Solid Waste Section, led an inter-agency task force in developing plans for the implementation of the grant program. He solicited input about the process from interested parties. Most comments addressed allocation of funds between tire material products, tire derived fuel, and research and development. Those comments were considered in developing current plans for the grant program.

Program funding is estimated to be \$1 million per year with \$5 million total for the duration of the program. The tax that supports this program is scheduled to sunset June 30, 2002.

At present, awards will be limited to tire derived fuel (commonly known as TDF, which is burned in combustion chambers to produce energy and heat) research and development, and rubber products such as tires, gaskets, hoses, and seals. Funding allocation for each category is presented above.

The ranges for funding are intended to be guides and not a firm commitment. Depending on the quality and quantity of proposals, all or none of the funding allocation will be met.

Category	Planned Funding	Minimum Grant Amount
Tire Derived Fuel	\$300,000 to \$500,000	\$50,000
Rubber Products	\$300,000 to \$500,000	\$50,000
Research and Development	\$300,000 to \$500,000	\$50,000

The terms of the grant awards will be for one year and will require a cash match of at least 20 percent. Also, the proposals need to meet the following criteria to be eligible:

- Applicant must have existing operation in North Carolina.
- Project activity will occur in North Carolina.
- Project will result in new and expanded use of North Carolina scrap tire material.
- Projects will be limited to activities consistent with the types of grants described above.

A request for proposal was issued in early 1998 with a proposal deadline of March 6, 1998. For more information, call Paul Crissman at (919) 733-0692, ext. 254.

Did you know?

"The economy has a copper roof," according to industry experts. Copper, a raw material traded internationally, is used in nearly all of the key economic sectors, including construction, telecommunications, high technology, and transportation. The market for copper, more than any other recy-

clable material, is a strong barometer of the worldwide economy.

Although you may not collect, process or trade in copper scrap, if you're involved in recycling, it is wise to monitor this market.

Source: Resource Recycling, Feb. 1998, vol. XVII, no. 2.

Recycling is part of Self-Help's Environmental Business Loan Fund Proposal

By Matt Ewadinger, RBAC Manager



North Carolina's community development bank proposes the creation of an Environmental Business Loan Fund that would expand recycling and other environmentally responsible businesses in the state.

After several years of analyzing and lending to the environmental industry, including recycling businesses, Self-Help has expressed an interest in establishing a loan fund targeted at companies that are environmentally responsible and whose work addresses environmental problems.

What will the loan fund accomplish?

This loan fund will nurture fledgling businesses until they become "bankable" and graduate to full-service private sector financing. According to Robert Schall, president of Self-Help Ventures Fund, "The purpose of the loan fund is to finance businesses that cannot receive conventional financing, whether from a bank, a venture capital firm, or other standard source."

The loan fund should be able to leverage other sources of financing to reach and serve as many businesses as possible. Additionally, the fund should afford stakeholders — including the fund manager, the technical and business assistance providers, and loan recipients — the opportunities to prove that certain innovative recovery methods, products, or manufacturing processes are economically viable.

The creation of an Environmental Business Loan Fund will require three conditions:

- **Capitalization.** The fund would require sufficient

capital to permit it to meet the potential annual demand for financing environmental businesses (now estimated at excess of \$2 million) and to support specialized staff. Capital funds would be sought from a combination of grants and loans from various private and public sources, including state government. A \$2 million appropriation from the North Carolina legislature, for example, could provide the impetus for a \$10 million fund. Self-Help has experience with establishing similar funds and has been successful with matching state appropriations with loans and grants from banks, insurance companies, corporations, foundations, and federal sources.

- **Operating Support.** The loan fund would not be self-supporting until it has lent most of its capital. Thus, operating support from foundations and government sources would be necessary to offset administrative costs until such time as interest earnings from loans can meet these costs. Self-Help would seek funds from foundations and corporations to help offset early start-up costs.

- **Technical Assistance.** The financing elements of an Environmental Business Loan Fund must be complemented by a strong technical capacity to assist firms with market development and technology commercialization. Self-Help would provide business assistance to loan fund applicants in the areas of financial management and general business management. More specialized technical assistance would be provided by RBAC, the Environmental Technology Consortium, and the Small Business and Technology Development Center.

The RBAC staff would like to know what North Carolina readers think about establishing an Environmental Business Loan Fund. Please respond to the telephone number or address on the back page of this newsletter, or send e-mail to Matt_Ewadinger@p2pays.org.

North Carolina Department of Transportation

Scrap tire market growing steadily

By Azam M. Azimi, Ph.D., P.E., and Marie Casey, North Carolina Department of Transportation

Some uses for scrap tires

- **Tire-derived fuel (TDF)**
- **Civil engineering applications**
- **Road embankment fill**
- **Lightweight backfill**



Scrap tire recycling and fuel markets have been growing steadily since the late 1980s. At present, the market consumes more than 60 percent of some 260 million scrap tires generated annually within the United States. Tire-derived fuel (TDF) is the largest single market for scrap tires nationally, consuming about 50 percent of total scrap tires per year. Cement kilns are not only one of the fastest growing fuel markets for tires, but also are used for producing cement from metal in tires.

North Carolina generates about 9.2 million used tires each year. About six percent of scrap tires produced in North Carolina go to TDF markets.

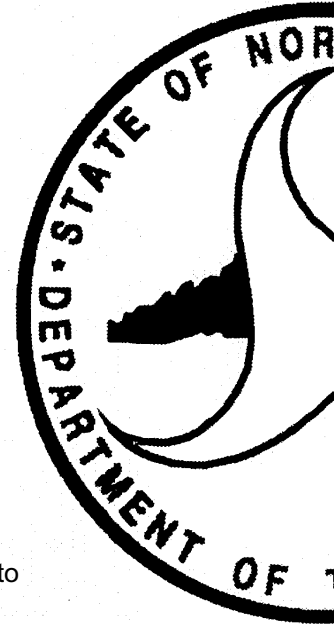
Another rapidly growing market for scrap tires is civil engineering applications, which use tire material in lieu of conventional construction material. North Carolina uses about one million scrap tires in its highway construction annually. This is about 11 percent of the total scrap tires generated in North Carolina. Typical applications include

road embankment fill (more than 90 percent) and lightweight backfill.

One concern often expressed about using scrap tires in engineering applications is the potential for leaching into water streams. North Carolina's Department of Transportation's (DOT) specifications aim to protect against leaching potential. DOT requires that tires be placed at least four feet above water table, have at least four feet of compacted soil on the sides and top of the embankment, and be mixed at a 40 percent rate of tires in alternate layers with soil. Monitoring wells adjacent to the first few scrap tire projects have indicated no leaching.

Another environmental concern is the internal heating of the shredded tire fills. Some western states experienced fires in their scrap tire filled projects in 1996. This created a temporary halt in the fill application of scrap tires on a national basis. After a thorough investigation into the cause of the fire by Federal Highway Administration (FHWA), a set of recommendations, "Design Guidelines to Minimize Internal Heating of Tire Shred Fills," was developed. All N.C. DOT's scrap tire fill projects are in full compliance with these guidelines. Additionally, N.C. DOT has measured the internal temperature of a few completed chipped tire fill projects and found the readings at each location were well below the ambient temperature. As a result of these verifications, the department has resumed incorporating chip tires into embankment fill.

DOT's goal is to use one million scrap tires in highway projects during fiscal year 1998.



uses recycled products, reduces solid waste



Procedures for use of recycled products in NCDOT projects

The North Carolina Department of Transportation (NCDOT) has established a Recycled Products and Solid Waste Utilization Task Force to review recycled products and materials for use in highway construction and maintenance operations. The Task Force is the central contact for various agencies, municipalities, or industries which have specific proposals to use recycled materials.

Once a proposal has been submitted, an examination of engineering, environmental, and economic factors is conducted by the Task Force. Other agencies, such as the New Products Evaluation Committee and the Department

of Environment and Natural Resources, also may be involved depending on the nature of the material and its proposed application. The Task Force then identifies appropriate department projects for using the material. The location, quantity, and type of material used is recorded and monitored periodically for performance and environmental concerns.

Anyone interested in submitting a recycled product or solid waste use proposal should request a product information package from Marie Casey, resource conservation engineer with the NCDOT Design Services Unit, at (919) 250-4128, or e-mail mcasey@doh.dot.state.nc.us. The information also can be submitted through the department's web site at www.doh.dot.state.nc.us/preconstruct/highway/dsn_srvc/value/recycle/.

DPPEA SOLICITS PROPOSALS FOR WOOD WASTE GRANT ROUND



The N.C. DPPEA announces a grant cycle to fund projects that reduce the flow of wood wastes to disposal facilities in North Carolina. The cycle seeks to fund the development of infrastructure and end use markets to help North Carolina achieve its goal of

reducing solid waste by 40 percent by June 30, 2001. The DPPEA has committed \$100,000 from the Solid Waste Management Trust Fund for this grant cycle. Applicants may request any amount of funding up to a maximum of \$25,000, but must provide a cash match equivalent to 20 percent of their grant request. For example, an applicant requesting a \$25,000 grant would have to match the grant award with at least \$5,000 in cash or direct expenditures.

Any viable project to reduce the flow of wood waste to disposal facilities is eligible for funding.

Examples of eligible projects include, but are not limited to: 1) purchasing equipment to establish or expand wood waste processing, marketing or end-use; 2) establishing cooperative processing between several facilities using stationary or mobile equipment; 3) using wood for reuse or as manufacturing feedstock; and 4) developing or encouraging other end-use applications of wood byproducts. No pilot programs, feasibility studies, or salaries will be funded.

Proposals must be postmarked no later than **Thursday, April 9**. **NO FAXES WILL BE ACCEPTED**. Any proposal postmarked past the deadline will be recycled. A letter will acknowledge receipt of all proposals. Announcements of award winners will be made by June 1. For more information or to obtain a copy of the Request for Proposals, contact Diane Minor or Kathleen Gray at (800) 763-0136 or (919) 715-6500 or by e-mail to Diane_Minor@p2pays.org.

Newsletter receives positive responses from readers

By Kathleen Gray, Market Development Specialist

Readers recently were asked to evaluate the *Recycling Works* newsletter. Although the response was small (about five percent), it was overwhelmingly positive. A majority of respondents rated the newsletter as excellent or very good. The newsletter also received high marks for providing the right amount of technical detail and the timeliness of articles.

Half of the survey respondents indicated that case studies are the most beneficial type of article appearing in the newsletter, and almost 40 percent valued legislative updates most highly. Market prices and RBAC activity updates also were valued highly.

Topics suggested for future issues include secondary markets for wood waste and hardwood mulch, composting and organics recycling, using public/private partnerships to market recyclable materials, the success of "zero landfill" policies, efficient packaging/distribution systems, and creative reuse of building materials and architectural scrap. Other suggestions include coverage of national recycling activities (such as America Recycles Day), used oil and wood ash recycling opportunities, metal recycling, source reduction, and cooperative marketing.

On a positive note for waste reduction, almost half of the survey respondents share the newsletter with two or more people. A number of readers also took the opportunity to "get on the information highway," with more than 20 percent of survey respondents opting for electronic delivery of future issues.

If you prefer to receive the newsletter electronically or have helpful suggestions for topics or how to improve the newsletter, send e-mail to Kathleen_Gray@p2pays.org.

Recycling Works

READER RESPONSES TO NEWSLETTER'S COVERAGE

- **Nearly 60% rated the newsletter as excellent or very good**
- **Nearly 70% responded that articles contain enough technical detail**
- **50% rated articles as excellent or very good in terms of timeliness**

TYPICAL SURVEY RESPONDENT

- **Government employee**
- **Recycling collector/processor/dealer**

Be on the lookout . . .

RBAC is conducting a **confidential** survey of the recycling industry in North Carolina this spring. The information from the survey should help RBAC stimulate North Carolina's recycling economy by providing a clearer sense of the supply/ demand balance for recyclable commodities in the state.

RBAC is sending the survey to all processors of recyclables listed in the North Carolina *Directory of Markets for Recyclable Materials*. Thank you in advance for your cooperation in completing this survey.

Gypsum, from page 1

“The reduction in the number of pulls to empty collection containers, coupled with a 50 percent reduction in tipping fees formerly paid to landfills, creates significant economic benefits for drywall scrap generators,” said Gerry Sutton, WRPC director of operations. “Demonstrated disposal cost savings up to \$1,000 per week at many plants also has attracted the attention of commercial and residential builders, who are now working with community landfill operators to install the WRPC system,” Sutton said.

Company executives assert that offering a low cost alternative to disposal will substantially increase reclamation of wallboard scrap. In addition, WRPC’s ability to manufacture valuable products from post-industrial waste presents new opportunities for other gypsum waste generators — such as power generators and plants that manufacture citric acid, phosphoric acid, and titanium dioxide — to divert by-product waste from disposal.

The WRPC production process

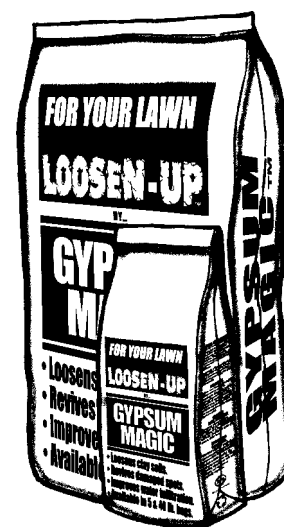
WRPC’s production process has required innovation from the start. Facility design was driven by a product line developed in a laboratory setting. Some of the production equipment did not exist. The company had to identify existing equipment with proven performance for manufacturing similar products, then modify the equipment to address the use of wallboard scrap as a feedstock and, ultimately, create a proprietary manufacturing and packaging system. The objective was to convert the scrap into useful raw material by changing it from gypsum covered with cardboard paper to calcium sulfate powder and cellulose fiber. The powder and fiber then could be combined to form pellets or separated as base materials for other products.

The production process enables reclaimed material to be reconstituted as value-added products by pelletizing or by cracking an extruded ingot into free-flowing crystals. “The process provides the flexibility to rapidly change from one product configuration to another, thereby accommodating sales demands and seasonal considerations,” said Mark Booth, WRPC president.

Finding major markets for products — the key to success

The patents for WRPC products are based on refined gypsum reclaimed from post-industrial by-products, not virgin ore. This use of a zero-cost-based

raw material enables competitive entry into major markets, such as home gardening, lawn care, golf course maintenance, spill absorbents for industry, animal waste management, and cat litter for pet owners. “Each of these markets, which ranges from \$1 billion to \$20 billion in annual sales, is receptive to a high performance product that is cost competitive with its virgin material counterpart,” said Malcolm Proper, WRPC marketing director.



Future development

As product demand increases, WRPC plans to expand its operations into other states. At least three states have been targeted, and staff anticipate such expansion occurring in about a year. “Our facility is the first of its kind, so we’ve had to learn the process by doing it,” Sutton said. “But we’ve taken what we’ve learned, fine-tuned our current system, and plan to make our next systems even bigger and better.”



Recycling Works is published by the N.C. Recycling Business Assistance Center (RBAC), a program of the Division of Pollution Prevention and Environmental Assistance of the N.C. Department of Environment and Natural Resources (DENR). For more information call (919) 715-6500 or (800) 763-0136, or write to DPPEA, P.O. Box 29569, Raleigh, NC 27626-9569.

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Reduce Reuse Recycle

**The RBAC is a program
of the N.C. Division of
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Call (919) 715-6500 or
1-800-763-0136 for free
technical assistance and
information about
preventing, reducing, and
recycling waste.

North Carolina market prices for recyclables

Prices current as of Jan. 15

Item	Western Region	Central Region	Eastern Region
METALS			
Aluminum Cans, lb. loose	\$0.54	\$0.52	\$0.55
Steel cans, gross ton baled	\$83	\$91	\$63
PLASTICS			
PETE, lb. baled	\$0.11	\$0.06	\$0.10
HDPE, lb. baled	\$0.16	\$0.07	\$0.20
PAPER			
Newsprint, ton baled	\$30	\$20	\$35, #8
Corrugated, ton baled	\$85	\$35	\$90
Office, ton baled	\$140	\$120	\$140
Magazines, ton baled	\$40	\$0	**
Mixed, ton baled	\$15	N/A	\$5
GLASS			
Clear, ton crushed	\$42	\$40	\$25
Brown, ton crushed	\$24	\$32	\$21
Green, ton crushed	\$15	\$8	\$2

**Facility sells magazines with newsprint.

Note: Prices listed above are compiled by RBAC and are for reference only. These prices are not firm quotes. RBAC obtained pricing information from processors for each category and developed a pricing range.

RBAC IS ON THE NET

The RBAC can be accessed through the Internet. Visit us at
<http://www.p2pays.org>



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