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Progress Report on Using Scrap Tires and Crumb Rubber in Highway Construction Projects

Submitted jointly by the
Texas Natural Resource Conservation Commission and the
Texas Department of Transportation

As required by Senate Bill 1, 77th Legislative Session
TNRCC-Rider 19 and TxDOT-Rider 44

January 1, 2002

Austin, Texas

TNRCC

Texas Department of Transportation

Progress Report on Using Scrap Tires and Crumb Rubber in Highway Construction Projects

Submitted to the following Committees:

Senate Natural Resources, House Natural Resources,
House Environmental Regulation,
Senate State Affairs, House Transportation,
Senate Finance, House Appropriations

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TNRCC Publication Number SFR-069/02

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Preface

This report is being submitted as required by Senate Bill 1, (General Appropriations Act), 77th Legislature, Texas Natural Resource Conservation Commission Rider 19 and Texas Department of Transportation Rider 44, shown below.

Texas Natural Resource Conservation Commission Rider 19 and Texas Department of Transportation Rider 44:

> **Agency Coordination.** The Texas Department of Transportation and the Texas Natural Resource Conservation Commission shall coordinate their efforts on the acquisition and potential uses of crumb rubber and shredded tire pieces in the various phases of highway construction. The Texas Department of Transportation and the Texas Natural Resource Conservation Commission shall provide to the appropriate Legislative Committees a report on their progress by January 1 of each fiscal year.

Executive Summary

This report is the third annual *Progress Report on Using Scrap Tires and Crumb Rubber in Highway Construction Projects,* submitted on January 1 each year to the Legislature. This report represents the cooperative effort between the Texas Natural Resource Conservation Commission (TNRCC) and the Texas Department of Transportation (TxDOT) to assess the scrap-tire situation in Texas and identify beneficial uses of tires, including highway construction.

Significant changes occurred in calendar 2000 that will bring about a positive transformation with regard to the number of scrap-tire stockpiles in Texas. These changes include:

- End-use markets continued to develop and the volume of material reportedly consumed by end users increased approximately 10% (from 20.1 million scrap tires in 1999 to 22.3 million in 2000). The number of scrap tires reportedly consumed by end users is approaching the number of scrap tires generated in Texas annually and is expected to continue increasing.

- Scrap-tire stockpiles were reduced by approximately 4%, primarily through reduction in storage volumes at operational scrap-tire storage sites.

- An appropriation to the TNRCC will enable the agency to develop contracts to reduce the volume of stockpiled scrap tires in Texas by nearly 64% within the next several years.

- The volume of scrap-tire material used in TxDOT projects increased 79% from the previous fiscal year.

- Several companies set up tire-processing operations in Texas or are making plans to locate in Texas.

- A rider in the TNRCC's appropriations will require the agency to coordinate with the Comptroller's Office to ensure that businesses that sell, transport, or store scrap tires are audited. Those audits are to be reviewed and analyzed by the TNRCC.

There are, however, still some obstacles to overcome. When all funds appropriated by the Legislature for cleanup of existing scrap-tire stockpiles have been exhausted, very limited funding will be available for the maintenance or cleanup of the remaining stockpiles. Additional funding would be necessary if the state is to eliminate the remaining stockpiles.

Although annual end-user demand for scrap tires is approaching the annual scrap-tire generation rate, demand for scrap tires is not consistent throughout all areas of the state. Areas with insufficient infrastructure tend to have a higher incidence of illegal scrap-tire dumping. Additional infrastructure development is needed in some regions so that viable end uses are available statewide.

TNRCC and TxDOT will continue to coordinate efforts to develop and maintain accurate data on scrap-tire usage and provide information to further promote beneficial recycling of tires. In addition, the agencies will continue to coordinate regarding scrap-tire uses, TxDOT specifications for the usage of scrap-tire rubber, and other recycling options in an effort to recycle or reuse every scrap tire discarded in Texas.

Introduction

Each year, Texans discard 24 million tires—a little more than one tire for every person residing in the state. Texas' discard rate is just above the national average, according to John Serumgard, executive vice president of the Scrap Tire Management Council in Washington, D.C. In addition to the 24 million tires discarded annually, there are 1.9 million whole tires in previously identified illegal sites and the equivalent of 58.7 million shredded and whole scrap tires stockpiled at TNRCC-registered sites. In calendar 2000, Texas had an inventory of almost 85 million scrap tires.

The TNRCC, which oversees the collection, processing, and recycling or disposal of used tires, estimates that 9 out of 10 tires discarded each year find an end use or are disposed of legally as waste. However, the backlog of tires stockpiled over the last decade—most shredded into small pieces—continues to be a problem. As limited funds are available, most of the inventory remains intact. In today's market, whole tires—not tire shreds—are most in demand by cement kilns and other facilities that use tires as fuel. Nearly 60 million shredded tires, weighing a total of 1 billion pounds, remain in stockpiles, creating a potential fire hazard with no end use in sight.

This accumulation of shredded tires is a carryover from the state waste tire recycling program, which operated from 1992 to 1997. During that time, the state managed all used tires, charging a $2 recycling fee for every tire replaced on vehicles and using the proceeds to ensure the used tires were picked up from local businesses and transported to processors for shredding or recycling. The funds also were intended to clean up illegal sites and to help retrofit energy-recovery facilities and reimburse them for using tires as fuel.

When the tire program was not renewed by the Legislature in 1997, the mandatory fee was dropped, allowing tire dealers to set their own fees. Supply and demand was left to a market-driven system. Most surplus tires had been shredded to curtail rodent and mosquito problems and to provide material for making usable products. Eventually, however, millions of those tires accumulated in areas where few end uses were available or transportation options were limited.

Dealing with Existing Stockpiles

Tracking and monitoring scrap tires is an ongoing challenge for the TNRCC, with the primary concern being how to prevent the castoffs from being dumped illegally and creating health or safety hazards. Rodents and mosquitoes find whole tires to be ideal breeding grounds. And mountains

of discarded tires pose an extreme fire hazard. Tire fires are extremely difficult to extinguish and can burn for days. A 1995 tire fire in Midlothian burned for 22 days and cost $1.6 million to combat.

Furthermore, tires burning in the open create significant health and environmental hazards. Civilians living near a smoke plume must be evacuated, and firefighters have to cover their skin and breathe through respirators. Moreover, burned rubber decomposes into oil and can pollute the surrounding soil and nearby surface water or groundwater.

The TNRCC is using these three strategies to deal with existing stockpiles:

- Reduce stockpiles at authorized (or formerly authorized) sites, starting with the largest and most problematic stockpiles.
- Identify and clean up sites where tires have been dumped illegally.
- Reduce illegal disposal by better accounting for the fate of tires when scrapped and by promoting legal options for disposing of tires.

Reducing Stockpiles at Authorized Facilities

In December 2000, the TNRCC reviewed the status and risks posed by whole and shredded scrap-tire stockpiles in Texas (see Table 1 on page 13). On finding that two sites each contained approximately 100 piles of whole tires, tire shreds, and other rubber debris, the TNRCC recommended that the Legislature consider appropriating funds to clean up those facilities.

In response, the 77th Texas Legislature in TNRCC Rider 35, "Waste Tire Disposal Grants," appropriated $7.5 million to address these two stockpiles, directing that:

> … (the) Natural Resource Conservation Commission shall give preference to proposals that involve recycling the material and result in local job creation. In addition, grant recipients must agree that any environmental threat of fire associated with waste tires and scrap tires will be eliminated within one year of the effective date of such grants.

With the funding in place, the TNRCC has developed separate bid packages for the cleanup of each of these high-priority sites. Cleaning up these two sites will reduce the volume of scrap-tire material in Texas stockpiles by 64%. This 920,000-cubic-yard reduction corresponds to the equivalent of 44.5 million tires. Although cleanup is likely to continue through September 2003, significant progress is expected on these two stockpile locations in 2002.

Priority Cleanup 1: Gibson-Atlanta (Cass County)

The TNRCC's first priority for cleanup is the Gibson Recycling, Inc., site, an abandoned waste tire storage and processing facility southwest of Atlanta. This 75-acre site holds the equivalent of 30 million scrap tires. The bid package for the cleanup of this site was scheduled to be published in December 2001 for 30 days and should be awarded by February 2002. The bid package includes these specifications:

- Bids will be accepted for the removal of scrap tire material from this facility to an authorized end user, for remediation of the facility by placement of scrap-tire materials in an on-site land remediation unit that meets specified engineering standards, or both.

- All scrap-tire materials must either be removed from the site to an authorized facility or placed in an on-site land remediation unit within 365 days of the contract award date, unless the completion date is extended in writing by the TNRCC.

To ensure that cleanup could proceed quickly if funds were to become available, in December 2000 the TNRCC published a request for site cleanup proposals. Based on the 19 proposals received, the most cost-effective and environmentally protective cleanup method is to use the tire shreds to reclaim the land for reuse. This involves mixing up to 50% tire pieces by volume with inert materials on site. The TNRCC contracted with an engineering firm to develop a corresponding design, which was included in the bid package.

Priority Cleanup 2: ERRI/TCI (Jones County)

The second shredded tire cleanup priority for the TNRCC is the Environmental Recovery and Recycling (ERRI)/Texas Crumb Industries (TCI) site, an inactive scrap-tire storage and processing site northeast of Stamford. This site holds the equivalent of approximately 14.5 million scrap tires. As this site had experienced several fires over the past several years, the TNRCC was concerned that ERRI/TCI was not taking adequate precautions to prevent a catastrophic fire from occurring and lacked the financial resources to maintain the facility properly.

After selecting the contractor for cleanup of the Gibson-Atlanta site and determining the amount of funding remaining for other site cleanups, the TNRCC will publish a request for bids for cleanup of the ERRI/TCI site. This bid package is scheduled to be published February 2002 and awarded in March 2002. Bids will be accepted for the removal of scrap-tire material from the ERRI/TCI site to an authorized end user, for the remediation of the facility by placement of scrap-tire materials in an on-site land remediation unit, or for projects involving both disposal methods.

Other Cleanups

When all funds appropriated by the Legislature for cleanup of the Gibson and ERRI/TCI sites have been exhausted, very limited additional funding will be available for the maintenance or cleanup of any remaining stockpiles. Additional funding will be needed to eliminate the remaining stockpiles.

Cleaning Up Illegal Tire Dumps

There are approximately 1.9 million whole scrap tires illegally stockpiled on private property. These stockpiles were placed on a list by TNRCC in 1997, and were previously referred to as priority enforcement sites. The 75th Legislature granted $9 million to remove the tires from these sites and prepare the tires for an end use.

Initially, there were 960 sites on the priority enforcement list. The TNRCC was successful in cleaning up 795 of these sites. Tires removed were used in construction of new landfills as well as for daily cover in operating landfills, in the installation of septic tanks, in the construction of a golf course, as tire-derived fuel, and for LRPUTs. The remaining 165 documented sites either contain tires that are in a condition for which there is no end use or are inaccessible—that is, are located away from existing roads or in deep ravines.

To clean up illegal disposal sites, the TNRCC often relies on supplemental environmental projects (SEPs), an innovative program in which an environmental violator may propose to apply a portion of the fine to clean up the local community. In 2000, approximately 117,000 illegally dumped tires were properly disposed in 19 counties (Atascosa, Austin, Bexar, Cameron, Coryell, Dallas, Denton, Falls, Fayette, Gillespie, Guadalupe, Hidalgo, Hill, Knox, La Salle, Maverick, Medina, Nueces, and Williamson). In 2001, more than 81,000 illegally dumped tires have been properly disposed through the SEP program in Gregg, Hidalgo, Jim Wells, Karnes, and Menard Counties.

Reducing Illegal Dumping

The TNRCC estimates that approximately 22 million of the 24 million annually discarded tires are finding end uses or are being disposed of legally in landfills. The 2 million unaccounted-for tires could be due to a number of factors, including but not limited to inaccurate reporting, failure to report, use in agricultural applications that do not require reporting, or illegal dumping.

To reduce the incidence of illegal dumping, the TNRCC is taking measures to improve accounting for the fate of scrap tires and promoting legal disposal options. As with any other solid waste, the TNRCC

responds to complaints and takes enforcement actions against illegal transporters, processors, and storage sites.

Improving Accounting for Scrap Tires

The TNRCC is coordinating with the Comptroller's Office to ensure that businesses that sell, transport, or store scrap tires are audited and that the results of the audits are transmitted to the TNRCC for review and analysis. The TNRCC will continue coordinating with the Comptroller's Office and submit a report to the Legislative Budget Board and the Governor detailing these audit results and summarizing other efforts and findings by December 1, 2002.

This audit fulfills the directive given the TNRCC by the Legislature in Rider 34:

> … enforce statutory requirements relating to waste, scrap, or used tires. It is the intent of the Legislature that all reasonable steps be taken to minimize the illegal storage, transport, or disposal of waste or scrap tires. The Commission shall audit or otherwise monitor businesses that sell, transport, or store such tires and identify illegal or improper activities as well as study methods for achieving a greater level of compliance for tire disposal within the State of Texas. The Commission also shall seek opportunities for coordination with other agencies, such as the Comptroller of Public Accounts, through interagency agreements or contracts. Cooperating agencies would use routine contracts with taxpayers during audits or other activity to obtain copies of tire manifests or other information relating to tire transport or storage in accordance with Health and Safety Code Section (§) 361.112. Such agreements should provide that the coordinating agency transmit such records to the Commission for review and analysis and should be designed to have minimal costs for the coordinating agency. The Commission shall submit a report no later than December 1, 2002, to the Legislative Budget Board and the Governor detailing their efforts and findings in accordance with this provision.

Promoting Legal Disposal Options

The TNRCC has developed a database that is available to the public through the Internet at **www2.tnrcc.state.tx.us/TireQuery/index.cfm**. This database allows the user to search for authorized transporters, processors, recyclers, generators, storage sites, land reclamation projects using tires (LRPUTs), and scrap-tire facilities.

To promote recycling in rural areas, the TNRCC last year collected nearly 49,000 tires at county collection events.

End Uses

Total Tires Consumed

Used tires have the potential to be a valuable resource, and most are finding end uses. The demand for used tires is growing in terms of energy resource, civil engineering, land recovery, and other applications. In 2000, the most recent year for which data is available, an estimated 22 million tires were consumed. The usage categories are explained below in order from largest to smallest (see Figure 1 below).

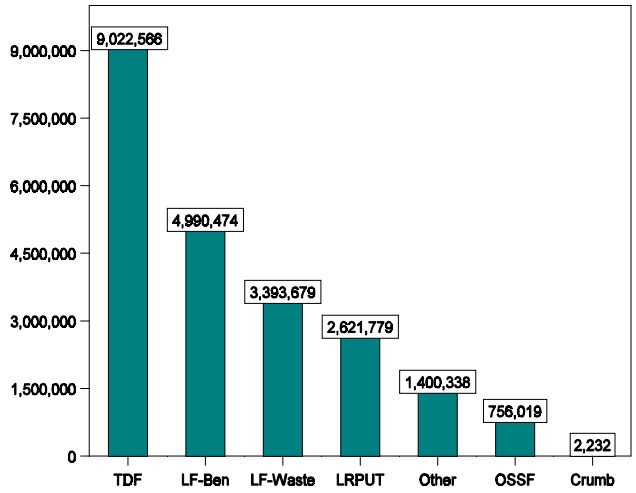
Tire-Derived Fuel (TDF): Tires are burned in some cement kilns and paper pulp mills to supplement the fuel mix of coal, wood bark, and/or natural gas. Texas has more cement kilns using tire-derived fuel than any other state, according to the Scrap Tire Management Council.

Beneficial Use in Landfills (LF-Ben): Shredded tires are used as drainage material in landfill leachate collection systems.

Buried in Landfills (LF-Waste): Unused tires are split, quartered, or shredded and buried as solid waste. This end use is the least desirable because the tires take up valuable landfill space.

Land Reclamation Projects Utilizing Tires (LRPUT): In areas that were strip mined or mined as gravel pits, tire pieces are mixed with soil and used as fill material. Because buried tires do not decompose, demand for tires in this category is fast-growing.

Other: This category includes tire bales, commercial products such as sandals and horsepens, and civil engineering uses such as erosion control .



Key to Abbreviations:

TDF =	Tire-Derived Fuel
LF-Ben =	Landfill Beneficial Use
LF-Waste =	Discarded as a Waste Product in a Landfill
LRPUT =	Land Reclamation Project Using Tires
Other =	Commercial products and civil engineering uses
OSSF =	On-Site Sewage Facility
Crumb =	Crumb Rubber

Figure 1. Reported End Uses for Scrap Tires, FY00

On-Site Sewage Facility (OSSF): Tire shreds are good filter material and can be used in place of gravel in the drain fields of septic systems.

Crumb: Finely ground tire rubber is used to modify asphalt and to make such products as traffic-control devices, rubberized lumber, and poured-in-place playground surfaces.

Tire-Derived Fuel

Tire-derived fuel (TDF) was the single largest use of scrap tires in Texas in 2000, consuming more than 9 million tires (see Tables 2 and 3 on pages 14 and 15). The TNRCC promotes TDF as a suitable, environmentally responsible end use for scrap tires. The agency is encouraging cement kilns to use higher volumes of this fuel source. Tires have a higher BTU value[1] and burn cleaner than coal, utilizing 100% of the tire. A 1997 U.S. Environmental Protection Agency (EPA) study concluded that the controlled combustion of tires in boilers and kilns can be done safely and will not exceed compliance standards for air emissions if the tires supplement the fuel mix by no more than 20%. The TNRCC requires all companies burning tires to do trial burns and to meet the emissions requirements of their air permits. Supporters also say this practice eliminates the risks posed by open tire burning.

In the 77th Legislative Session, in TNRCC Rider 36, "Grants for Tire-Derived Fuels," the TNRCC was appropriated $2 million for the purpose of awarding grants to support the use of tire-derived fuel. These grants are to be used to implement the settlement of lawsuits related to the state implementation plans for air quality. The TNRCC is currently working on this funding issue and intends to implement the provisions of the rider prior to the next legislative session. The Legislature's new TDF grants could result in another 2 million to 3 million used tires being consumed annually as fuel.

In Rider 29, "Waste Recycling," the Legislature required the TNRCC to communicate and work with electric utilities and other industries in Bexar, Cameron, Comal, El Paso, and Hidalgo Counties to encourage the use of TDF. TNRCC staff have contacted and are working with an electric utility in the El Paso area regarding the possibility of using TDF to produce electricity. In May 2001, the TNRCC co-hosted a "Tire-Derived Fuel Workshop—An intensive discussion of TDF use, regulations, and processing" with the EPA and the Scrap Tire Management Council. The TNRCC also presented information regarding the use of TDF during its 2001 Environmental Trade Fair and will offer updated information at the

[1] BTU = British thermal unit, a measure of the amount of heat that can be obtained from a fuel.

2002 event. The TNRCC will continue to work with electric utilities and other industries in all areas of the state to encourage the use of TDF.

TxDOT's Scrap-Tire Rubber Use

In fiscal 2001 (September 1, 2000–August 31, 2001), TxDOT significantly increased its use of scrap-tire rubber, using almost 14,000 tons of rubber—the equivalent of 1,366,100 tires. This number represents a 79% increase over use in fiscal 2000, which itself was an increase of 57% over the previous fiscal year's total. The more than 1.3 million scrap-tire equivalents is the largest amount of scrap-tire rubber ever used by TxDOT in a single year. (See Figure 2 below.)

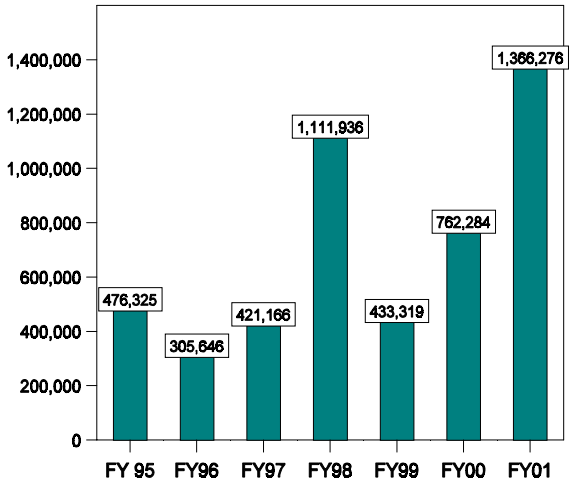


Figure 2. Scrap-Tire Equivalents Used by TxDOT, FY95–01

In January 2001, TxDOT received the "Outstanding Recycling Program Award" from the Rubber Pavements Association for their efforts to increase the acceptance and use of all recycled materials, especially crumb rubber.

Apparent Disparity in Crumb Rubber Numbers

The amount of crumb used by TxDOT (1,366,276 scrap-tire equivalents) appears to be contradictory with the amount of crumb used in Texas (2,232 scrap-tire equivalents). This apparent conflict is caused because there is only one company producing crumb rubber in Texas, Granular Products and Services. This company produces crumb rubber from material that is buffed from tire carcasses in preparing them for retreading. The scarcity of Texas crumb-rubber suppliers necessitated that road construction contractors obtain crumb rubber from out of state. The good news is that a new crumbing facility should be set up in Baytown in February 2002. The operator of the new facility will be Resource Technologies Group (RTG), currently the largest manufacturer of crumb rubber in North America.

Major Crumb Applications

In fiscal 2001, TxDOT used scrap-tire rubber in four primary applications: crumb-rubber-modified hot mix, crack sealer, a preblended chip seal, and hot-applied rubber.

The largest use of rubber last year was hot-applied rubber (TxDOT Specification Item 318). This use more than tripled from the previous fiscal year (see Figures 3 and 4 on the facing page). This material is most

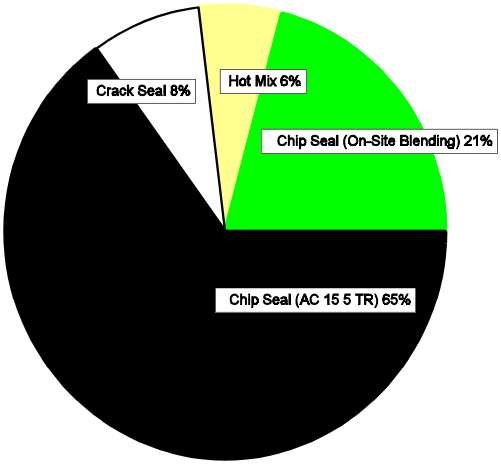


Figure 3. TxDOT's Use of Crumb Rubber, FY00

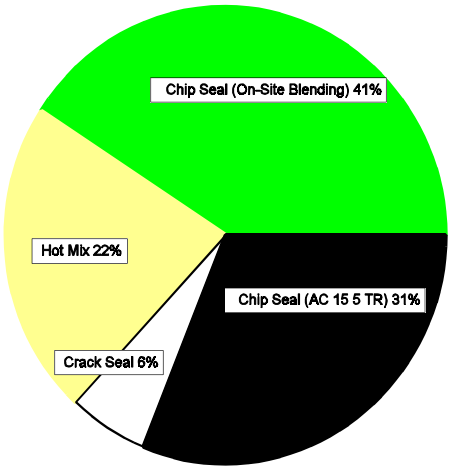


Figure 4. TxDOT's Use of Crumb Rubber, FY01

typically used as a rubber underseal to prevent water from getting into and destroying the foundation of the road pavement or to help any asphalt surface stick to a concrete base. Hot-applied rubber uses between 15 and 20% crumb rubber.

The use of crumb rubber in hot-mix asphalt also increased in fiscal 2001. Crumb rubber comprises between 15 and 20% of the asphalt used in this mix. Using crumb rubber as a hot-mix modifier can increase pavement life, reduce pavement cracking, and reduce road noise. Despite its many positive attributes, adding crumb rubber is not a one-size-fits-all solution for every pavement. Traffic volumes, pavement design, and, most importantly, available funding all influence the potential for use of crumb-rubber-modified pavements. Funding for road construction and maintenance in Texas is insufficient to meet demand. Using crumb rubber to modify asphalt can significantly increase the purchase price. Frequently, from a financial standpoint, it is not possible to use crumb-rubber-modified asphalt, even though its life-cycle cost is lower.

In fiscal 2001, TxDOT also used a sizeable amount of scrap-tire rubber as a component of a preblended chip seal material known as AC 15 5 TR. This material contains 5% tire rubber and is used as a preventive maintenance technique to extend road life. AC 15 5 TR is applied on the road surface, followed by a layer of rocks, to cover cracks and prevent moisture from reaching the lower pavement layers.

Market Development Efforts

TxDOT's dramatic increase in scrap tire use in fiscal 2001 can be attributable to a significant number of workshops designed to increase the awareness and use of scrap-tire rubber among those in the road construction industry in Texas. The first such workshop, co-hosted by TxDOT, the TNRCC, and EPA Region 6, was held on January 17, 2001, in Austin. This workshop provided information about a variety of different end uses for scrap-tire rubber, including asphalt rubber pavements, scrap-tire bales, scrap tires as artificial reefs, and crumb rubber as a top dressing to protect grass from heavy pedestrian traffic damage, among others.

In addition to this workshop, TxDOT and Texas Tech University hosted seven regional workshops in the spring and summer of 2001 that provided information about recycled materials suitable for construction purposes available within each region. Scrap tires and their potential end uses were covered in every workshop. More than 200 people attended these workshops representing city, county, and state road construction personnel, as well as, contractors and material suppliers.

The Rubber Pavements Association also hosted several regional workshops promoting the use of crumb rubber modified pavements. TxDOT staff, city and county road construction personnel, and contractors attended these workshops which featured speakers knowledgeable in formulation techniques and benefits of adding crumb rubber to asphalt. These workshops were held in Lubbock, Houston, San Antonio, Lufkin, El Paso, Abilene, and Pharr from fall 2000 through spring 2001.

These workshops helped increase the demand for tire rubber products. To increase the supply of rubber processors and products, TxDOT responded to numerous requests for information from companies considering locating or expanding operations in Texas. As an example, both TxDOT and TNRCC staff worked extensively with a company considering establishing a scrap-tire baling operation in the Valley, near McAllen. This company, which had operations in another state, was looking to establish a Texas presence. TNRCC staff provided information about scrap-tire stockpiles available in the area. TxDOT looked for end uses for the bales that would be produced. The company seemed to have support from local representatives to identify available property and ensure a continuous supply of scrap tires. The apparent activity has slowed, however, although the company indicated that it was still considering establishing a Texas facility.

Outlook

Future Plans

To help facilitate the use of scrap-tire bales, TxDOT enlisted Texas Tech University to research previous uses of scrap-tire bales and develop specifications. Specifications were developed for use of tire bales as a fill material in embankments. There are plans to use 20,000 whole scrap tires to produce 200 scrap-tire bales. These bales will be used to repair an embankment slope slide near downtown Fort Worth. Construction on this project is expected to begin early in 2002.

Additionally, the Texas Transportation Commission voted to accept a donation of crumb rubber from Ford Motor Company. The crumb will be generated from Ford-replaced tires removed from Texas vehicles. This

crumb rubber will be used as an asphalt modifier on select TxDOT road projects.

Another effort planned to continue the increased demand for scrap-tire rubber in the coming year is a conference sponsored by the EPA, the TNRCC, and TxDOT scheduled for January 30, 2002, in Dallas. This conference has a number of other cosponsors, including the Rubber Pavements Association and Ford Motor Company. The 2002 conference will focus on the benefits of asphalt rubber pavements and how to design them. See Appendix 2 on page 18 for the conference agenda.

Plans were announced recently to locate a rubber-modified asphalt manufacturing plant in Big Spring. This plant is expected to be operational in the spring of 2002.

Conclusion

The scrap-tire situation improved in calendar 2000, and significant changes occurred that will bring about a positive transformation with regard to the number of scrap tires stockpiled in Texas:

- End-use markets continued to develop and the volume of material reportedly consumed by end users increased approximately 10% (from 20.1 million scrap tires in 1999 to 22.3 million in 2000). The number of scrap tires reportedly consumed by end users is approaching the number of scrap tires generated in Texas annually and is expected to continue increasing.

- Scrap-tire stockpiles were reduced by approximately 4%, primarily through reduction in storage volumes at operational scrap-tire storage sites.

- An appropriation to the TNRCC will enable the agency to develop contracts to reduce the volume of stockpiled scrap tires in Texas by nearly 64% within the next several years.

- The volume of scrap-tire material used in TxDOT projects increased 79% from the previous fiscal year.

- Several companies set up tire-processing operations in Texas or are making plans to locate in Texas.

- A rider in the TNRCC's appropriations will require the agency to coordinate with the Comptroller's Office to ensure that businesses that sell, transport, or store scrap tires are audited. Those audits are to be reviewed and analyzed by the TNRCC.

However, there are still some obstacles to overcome. When all funding appropriated by the Legislature for cleanup of existing scrap-tire stockpiles has been exhausted, very limited funding will be available for the maintenance or cleanup of the remaining stockpiles. Additional funding will be needed to eliminate the remaining stockpiles.

Although annual end-user demand for scrap tires is approaching the annual scrap-tire generation rate, demand for scrap tires is not consistent through all areas of the state. Areas with insufficient infrastructure tend to have a higher incidence of illegal scrap-tire dumping. Additional infrastructure development is needed so that viable end uses are available statewide.

TNRCC and TxDOT will continue to coordinate efforts to develop and maintain accurate data on scrap-tire usage and provide information to further promote beneficial recycling of tires. In addition, the agencies will continue to coordinate regarding scrap-tire uses, TxDOT specifications for the usage of scrap-tire rubber, and other recycling options in an effort to recycle or reuse every scrap tire discarded in Texas.

Table 1. Tire Stockpiles at TNRCC-Registered Sites (in Scrap-Tire Equivalents)

Facility	Reg. No.	Location	Stockpiles as of End of Fiscal:		
			1998	1999	2000
*Gibson Recycling, Inc.	79500	Atlanta	27,116,847	29,823,360	29,823,360
*ERRI/TCI	79502	Stamford	7,703,288	7,856,868	7,856,868
Safe Tire Disposal	79506	San Antonio	6,884,890	7,446,237	6,368,737
Safe Tire Disposal	79505	Penwell	5,422,546	5,008,890	5,023,711
Safe Tire Disposal	79507	Cleveland	6,060,909	5,585,892	4,988,284
**Gibson Recycling, Inc.	79508	Beaumont	2,048,100	2,048,100	2,048,100
Safe Tire Disposal	79505	Midlothian	4,436,634	1,969,017	1,348,077
Nathaniel Energy	44115	Fort Worth	0	0	871,332
Waste Recovery Inc.	79503	Baytown	558,866	475,650	330,106
Tres Pesetas	79540	Lubbock	104,200	48,253	38,661
Cameron Land & Cattle	79547	San Antonio	0	0	0
Island Industries	79545	Corpus Christi	0	0	0
J&M Trucking	79543	San Antonio	0	0	0
**Scrap Tire Recycling	79501	Pasadena	NR	NR	700,000
ACME	79539	Atlanta	37,227	42,139	32,142
Thoshanowasti	79544	Amarillo	22,682	38,282	21,576
**Touche International	79557	Whitesboro	NA	212	500
Tres Pesetas	79030	El Paso	0	87,191	0
Total			62,167,698	61,151,592	58,750,954

*Cleanup of site scheduled for 2002.
**No annual report filed; these numbers are estimated.

Table 2. Reported End Uses for Scrap Tires, FY00 (in Scrap-Tire Equivalents)

Name	County	Quantity with the Reported End Use of:						
		TDF	OSSF	Crumb	Land Recla-mation	Landfill		Other
						Beneficial	as Waste	
Able Tire Co.	Johnson	3,946,203					14,250	
Acme Tyre	Cass	2,541	10,338	2,232				995,569
American Tire Disposal	Bexar						119,110	
Cameron Land & Cattle	Starr							147,790
Camie's Tire Co.	Bexar							
Green Tree Resorts	Harris				15,039			
J & M Trucking	Bexar						255,907	
Island Industries	Nueces						172,900	
La Porte Tire Center	Harris						1500	
Nathaniel Energy	Dallas	4,065				5,166	20,761	
Recycled Rubber	Travis							275
Safe Tire (Cleveland)	Liberty		597,607					
Safe Tire (Midlothian)	Ellis	38,277	126,303			4,158,065		
Safe Tire (Odessa)	Midland						221,879	
Safe Tire (San Antonio)	Bexar	1,466,716	21,771			827,243		
Silver Creek	Tarrant				2,227,300			
*Thoshanowasti	Randall	3,630					90,996	92,726
Tres Pesetas (El Paso)	El Paso	15,130	147,582		379,440			53,900
*Tres Pesetas (Lubbock)	Lubbock	232,032					258,987	50,190
Uni-wide	Harris							50,231
Waste Recovery	Harris	3,313,972					758,016	9,657
Transporters							1,493,623	
Total Tires		**9,022,566**	**756,019**	**2,232**	**2,621,779**	**4,990,474**	**3,393,679**	**1,400,338**

Table 3. Tire-Derived Fuel Consumption by User (in Scrap-Tire Equivalents)

Facility	Type	Location	Authorized TDF Quantity	Quantity Burned		
				in 1998	in 1999	in 2000
*Capital Cement	Cement	San Antonio	2,150,000	1,280,000	1,006,250	950,000
Donahue	Paper/pulp	Houston	2,055,000	1,455,000	1,354,797	1,596,373
Holnam	Cement	Midlothian	10,565,000	105,000	112,025	75,800
*North Texas	Cement	Midlothian	8,415,000	3,465,000	3,741,149	3,748,561
Texas Industries	Cement	New Braunfels	3,365,000	725,000	657,100	580,000
*Texas Lehigh	Cement	Buda	3,180,000	45,000	7,388	8,080
Southdown	Cement	Odessa	2,055,000	0	0	263,710
Sent out of state**						2,072,245

*These users burn whole tires. All others burn tire shreds.
** Tires were sent to Oklahoma, Louisiana, Tennessee, and Alabama for use as TDF.

Appendix 1. Scrap-Tire Processors in Texas

A Better Buy Tire Company
PO Box 2849
Belton
Registration No. 6200028

American Tire Disposal Company
PO Box 185
Katy 77492
Registration No. 6026988

C & S Environmental Tire Salvage
PO Box 302
Paris 75460
Registration No. 6026701

Cameron Land & Cattle Company
7132 Oak Drive
San Antonio 78256
Registration No. 79547

Camie's Tire Company
10870 FM 1783
Gatesville 76528
Registration No. 79559

CC Crawford Retreading Company
101 W Avenue D
Ennis 75119
Registration No. 6025279

City of Laredo
5512 Thomas Avenue
Laredo 78041
Registration No. 6200048

Dearth Brothers, Inc.
3515 Almeda-Genoa Road
Houston 77047
Registration No. 79555

DWI Hobby Shop
PO Box 1262
Marble Falls 78654
Registration No. 79548

G&H Scrap Tires
420 E FM 495
Pharr 78577
Registration No. 6027076

Green Tree Resorts L.L.P
11800 Sheridan Road
Houston 77050
Registration No. 6200006

H&H Tire Shop
6427 Montgomery Drive
San Antonio 78239
Registration No. 6026600

Island Industries
2503 N Port
Corpus Christi 78401
Registration No. 79545

J&J Used Tires
5100 Mount Houston
Houston 77093
Registration No. 6027052

J&M Truck Tire Shop, Inc.
11420 Hwy 16 S
San Antonio 78224
Registration No. 79543

JL Jones Tire Inc.
401 XIT Drive
Littlefield 79339
Registration No. 6008454

John's Tire Shop
2501 N. Chadbourne Street
San Angelo 76903
Registration No. 6200029

LaPorte Tire Center
11011 W. Fairmont Parkway
LaPorte 77571
Registration No. 6025572

Lopez Traction Facility In.
PO Box 1966
Laredo 78044
Registration No. 6013295

Lubbock Waste Tire Recycling
14636-C Montana Avenue
Lubbock 79405
Registration No. 44154

Nathaniel Energy Corporation
1323 Fulghum Road
Hutchins 75141
Registration No. 44155

Real Deal Recycling
502 SE First Street
Mineral Wells 76067
Registration No. 99279

Recovery Technologies
Wade Road
Baytown 79503
Registration No. 79503

Recycled Rubber Mats
Austin 78758
Registration No. 79550

Road Runner Tire & Auto
2509 Agnes Street
Corpus Christi 78405
Registration No. 6200013

Roy's Tires
11802 CR 6500
Lubbock 79363
Registration No. 6200021

Rubber Recycling Resources
1400 South Travis
Cleveland 77371
Registration No. 79556

Safe Tire Disposal Corporation
PO Box 592
Cleveland 77327
Registration No. 79507

Safe Tire Disposal Corporation
PO Box 1888
Penwell 79776
Registration No. 79505

Safe Tire Disposal Corporation
PO Box 460
Midlothian 76065
Registration No. 79504

Safe Tire Disposal Corporation
11150 Applewhite Road
San Antonio 78224
Registration No. 79506

Silver Creek Materials, Inc.
PO Box 150665
Fort Worth 76108
Registration No. 6079554

Thoshanowasti
315 W. Farmers Avenue
Amarillo 79118
Registration No. 79544

Tire Express Service
PO Box 3881 5302
Mission 78572
Registration No. 6027056

Toms Tires Service
PO Box 61144
Midland 79765
Registration No. 6015064

Touche International
PO Box 159
Burleson 76028
Registration No. 79557

Tres Pesetas, Inc.
14636 Montana Avenue
El Paso 79938
Registration No. 79030

UNI-Wide Auto Imports, Inc.
9909 Airline Drive
Houston 77037
Registration No. 79551

Appendix 2. Agenda of Dallas January 2002 Crumb Rubber Conference

Dallas Crumb Rubber Conference

January 30, 2002

Dallas Wyndham Garden Hotel 2015 Market Center Blvd. Dallas, TX 75207 P: 214-741-7481

SPONSORS

EPA United States Environmental Protection Agency — REGION 6 Arkansas Louisiana New Mexico Oklahoma Texas

U.S. Department of Transportation Federal Highway Administration

East Arkansas Regional Solid Waste Management District

Rubber Pavements Association Founded 1985

ITRA International Tire & Rubber Association, Inc.

Texas Department of Transportation

Texas Natural Resource Conservation Commission

Scrap Tire Management Council Reduce, Reuse, Recycle, Recover

AGENDA

7:30 - 8:00	**Registration**
8:00 - 8:20	Welcome & Introductions - Larry Starfield, EPA Reg. 6 Deputy Regional Administrator & Byron Lord, FHWA
8:20 - 8:55	**Environmental Challenges of Waste Tires - Ben Banipal EPA & John Forehand, TNRCC**
8:55 - 9:25	Scrap Tire Pile Management and Fire Prevention - Michael Blumenthal, STMC
9:25 - 9:55	**Scrap Tire Industry Overview - Mary Sikora, ITRA**
9:55 - 10:25	Crumb Rubber Production & Markets- Jim Anderson, RTG
10:25 -10:35	**Break**
10:35 - 11:05	TXDOT Recycling Programs - Rebecca Davio, TXDOT
11:05 - 11:35	**Asphalt Rubber History and Market Factors - Doug Carlson, RPA**
11:35-12:35	Lunch - Guest Speaker - Andy Acho, Ford Motor Company
12:35- 1:05	**Asphalt Rubber Manufacturing and Placement - Mark Belshe, FNF**
1:05 - 1:35	Arizona Case Study - George Way, ADOT
1:35 - 2:05	**Texas Case Study - Dale Rand, TXDOT**
2:05 - 2:35	California Case Study - Jack Van Kirk, Basic Resources
2:35 - 2:50	**Break**
2:50 - 3:25	Florida Case Study - Larry Smith, FDOT Ret.
3:25 - 3:55	**Asphalt-Rubber Reasearch and Life Cycle Costs - Dr. Jon Epps, UNR Emeritus**
3:55 - 4:25	Partnerships for Sustainability - Katherine Holtz, Freese Nichols, Inc.
4:25 - 4:35	**Session Wrap Up - Carl Edlund, EPA Reg. 6 Dir. of Multimedia Planning and Permitting**

REGISTRATION DEADLINE: JANUARY 11, 2002 Seating is limited to 150 people
Registration Fee $25.00 US
Call (480) 517-9944 or Ben Banipal EPA Reg. 6 (214) 665-7324 for more information.