



Colorado Department
of Public Health
and Environment

Status of Waste Tire Recycling in Colorado

2011 Annual Report to the Transportation
Legislation Review Committee



Executive Summary

Calendar year 2011 marks the eighth year the Colorado Department of Public Health and Environment (the department) has compiled data related to the number of waste tires collected at waste tire processing, collection and storage facilities and by waste tire haulers and end users in Colorado and the status of Colorado's Waste Tire Program. Waste tire processing facilities are processing tires into different tire-derived products that are used as tire-derived fuel, as alternative daily cover at solid waste landfills, as fencing and windbreaks, and as safety products. Tires stored in monofills will be reused at a later date for various tire-derived products, including tire-derived fuel. The second largest monofill is close to obtaining the necessary permits to burn processed tire shreds, or tire chips, as fuel to power a cement kiln. Additionally, the Colorado Waste Tire Program passed two sets of regulations in 2011 regarding waste tire management and implementation of the waste tire processor and end use reimbursement fund.

This 2011 calendar year annual report on waste tire recycling in Colorado is being transmitted to the Transportation Legislation Review Committee as

'Waste tire processing facilities are processing tires into different tire-derived products'

required by House Bill 04-1428 and section 25-17-202.7, C.R.S. The statute requires the department to issue a report to the Transportation Legislation Review Committee on or before July 1st each year that includes the total number of waste tires recycled in the state. This information is submitted to the department pursuant to the Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Sections 10.3.6, 10.5.7, 10.6.7 and 10.7.7).

The department gathers this information through annual reporting from waste tire processing, collection and storage facilities and waste tire haulers and end users. To improve the data received, the department continued outreach efforts to educate waste tire facility operators regarding their compliance and reporting responsibilities.



Colorado Department of Public Health and Environment Hazardous Materials and Waste Management Division Solid Waste and Materials Management Program



Principal Author: Shana Baker, Environmental Protection Specialist

Contributing Authors and Technical Assistance:

Charles G. Johnson, Solid Waste and Materials Management Program Manager
Brian Gaboriau, Waste Tire Grants Administrator
Nick Boudreau, Environmental Protection Specialist
David Snapp, Environmental Protection Specialist

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For additional information or copies:

Charles G. Johnson
Solid Waste and Materials Management Program
Hazardous Materials and Waste Management Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
(303) 692-3348

Waste Tire Update

Data submitted to the department by waste tire facilities (waste tire processing and collection facilities and waste tire monofills) and waste tire haulers and end users indicates there were 5,014,143 waste tires generated in the state of Colorado during calendar year 2011. Considering Colorado's latest census population estimate of 5,116,796 people, this rate of waste tires generated is slightly less than the accepted nationwide industry standard that predicts a waste tire generation rate of one waste tire/person/year.

A total of 493,457 of the 5,014,143 waste tires generated in Colorado in 2011 were hauled to a recycling facility in Utah for processing and 715 waste tires were transported to a tire disposal facility in New Mexico. Conversely, 422,160 waste tires were shipped to Colorado waste tire facilities from out-of-state sources.

Colorado waste tire processors, and a Utah-based waste tire processing facility that processed Colorado-generated tires recycled a total of 5,097,944 tires in 2011. This corresponds to 100 percent of the tires generated in 2011 by Colorado sources being recycled (Page 5, Figure 1). This figure represents an increase from the 93 percent recycling rate achieved in 2010 and an overall increase in the number of tires recycled.

The 100 percent recycling rate indicates that processing facilities in Colorado and surrounding states processed a number of tires equivalent to the number of waste tires generated in Colorado. However, these processors only had the capacity to recycle 93.8 percent (5,097,944) of the total



Tires can be processed into various sizes to meet end use specifications.

number of tires generated in Colorado plus those sent to Colorado from states to the east and northeast (5,436,303 total tires).

Figure 2 (Page 5) provides an annual comparison of Colorado's waste tire recycling rates for the last eight years. The waste tire recycling rates remained relatively consistent each year until 2009 when the recycling rate moved up sharply to levels above 90 percent. This increase can be attributed to more accurate data collection methods, identification of an out-of-state recycler of Colorado tires and an increase of tires used as tire-derived fuel.

Figure 3 (Page 5) captures the top 10 end-use markets for waste tires recycled during calendar year 2011. Of the 10 end-use markets identified, the top five included the processing of waste tires to be used as tire-derived fuel by cement kilns, use of tire shreds as alternative daily cover at solid waste landfills, the processing of waste tires into crumb rubber for use in roadways and molded rubber products, resale of salvage tires

for reuse or retreading, and tire bales for use as fencing and windbreaks.

Figure 4 (Page 5) reflects the number of waste tires in storage at registered waste tire facilities statewide at the end of calendar year 2011. The on-site waste inventory increased by 69,452 tires during the year. As of 2011, 60,274,182 waste tires were stored in tire monofills while 969,421 waste tires were stored temporarily at waste tire processing and collection facilities.

In general, in 2011 a majority of waste tire processing and collection facilities decreased their storage inventory by increasing waste tire processing capacity or shipping tires offsite for processing into tire-derived product. Figure 5 (Page 5) illustrates the amount of waste tires used as products. In 2010, 4,519,277 tires went to end-use markets. In 2011, that figure grew to 5,097,944, an 11 percent increase in the number of tires going to end-use markets. The number of tires going to end-use markets increased by 2.5 percent in 2009 and by 7.5 percent

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Waste Tire Update

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in 2010. This increase represents a continuing trend of more waste tires going to end-use markets within and outside of Colorado.

By contrast, Figure 6 (Page 5) describes a further decline in the number of waste tires added to waste tire storage inventories in 2011. During 2008, 783,000 waste tires entered the waste tire storage inventory, compared to 572,121 tires entering waste tire inventory in 2009 and an increase to 604,151 tires in 2010. The department observed a decline in 2011 with only 69,452 additional waste tires entering

'In 2011, the number of waste tires going to end-use markets grew to 5,097,944, an 11 percent increase over 2010.'

waste tire storage inventories due to the removal of waste tires from temporary storage at processing and collection facilities and tires processed into tire-derived product for end use.

Fire Prevention Fund Update

Waste Tire Fire Prevention Funds funded a Dec. 10, 2011 Scrap Tire Prevention and Firefighting Seminar in Colorado Springs. Twenty attendees from the El Paso County area learned about fire prevention and planning, equipment and supplies used to fight a tire fire, and health and safety aspects of fighting a tire fire.

Regulatory Authority and Program Elements

The Colorado Department Public Health and Environment Department's Solid Waste and Materials Management Program, located within the Hazardous Materials and Waste Management Division, and the Division of Environmental Health and Sustainability are responsible for overseeing the Waste Tire Program.

The Solid Waste and Materials Management Program is responsible for ensuring compliance with laws and regulations pertaining to waste tire management and administers the waste tire fire prevention and law enforcement grant funds. The Division of Environmental Health and Sustainability Waste Tire Program provides funding for the reuse or recycling of waste

tires generated in Colorado through the processor and end user, recycling incentives, illegal waste tire cleanup, and waste tire market development grant funds.

The Waste Tire Program receives no monies from Colorado's General Fund and is 100 percent fee supported. Senate Bill 09-289 changed how the Colorado Department of Revenue collects the \$1.50 tire fee to support the Waste Tire Program, shifting collection to each new tire sold in Colorado rather than collecting the fee at the disposal point.

House Bill 10-1018 allocated funding from the \$1.50 fee to cover program staff and administrative costs, and appropriated a percentage of the fee to cover the five department-administered grant funds :

- Processor and End User Fund: Funding for waste tire processors and end users to encourage the use of waste tires.
- Waste Tire Cleanup Fund: Provides grants to counties and municipalities for the removal of illegally disposed waste tires.
- Waste Tire Market Development Fund: To develop markets for waste tires.
- Waste Tire Fire Prevention Fund: Provides grants to fire agencies to purchase tire fire equipment and supplies and to fund training.
- Law Enforcement Grant: Grants to law enforcement and fire agencies for waste tire enforcement/oversight.

By the Numbers: Overview of Colorado's Waste Tire Activity

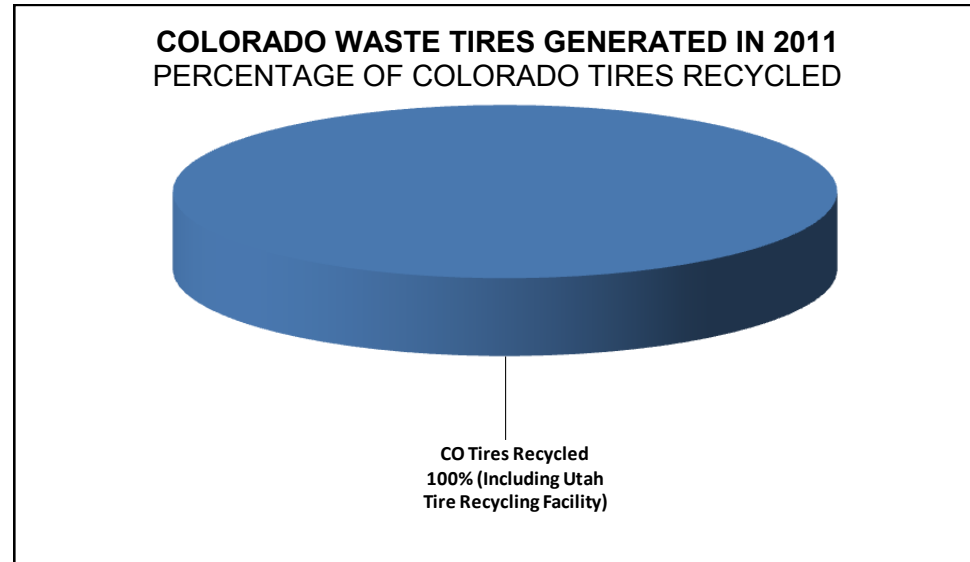


Figure 1

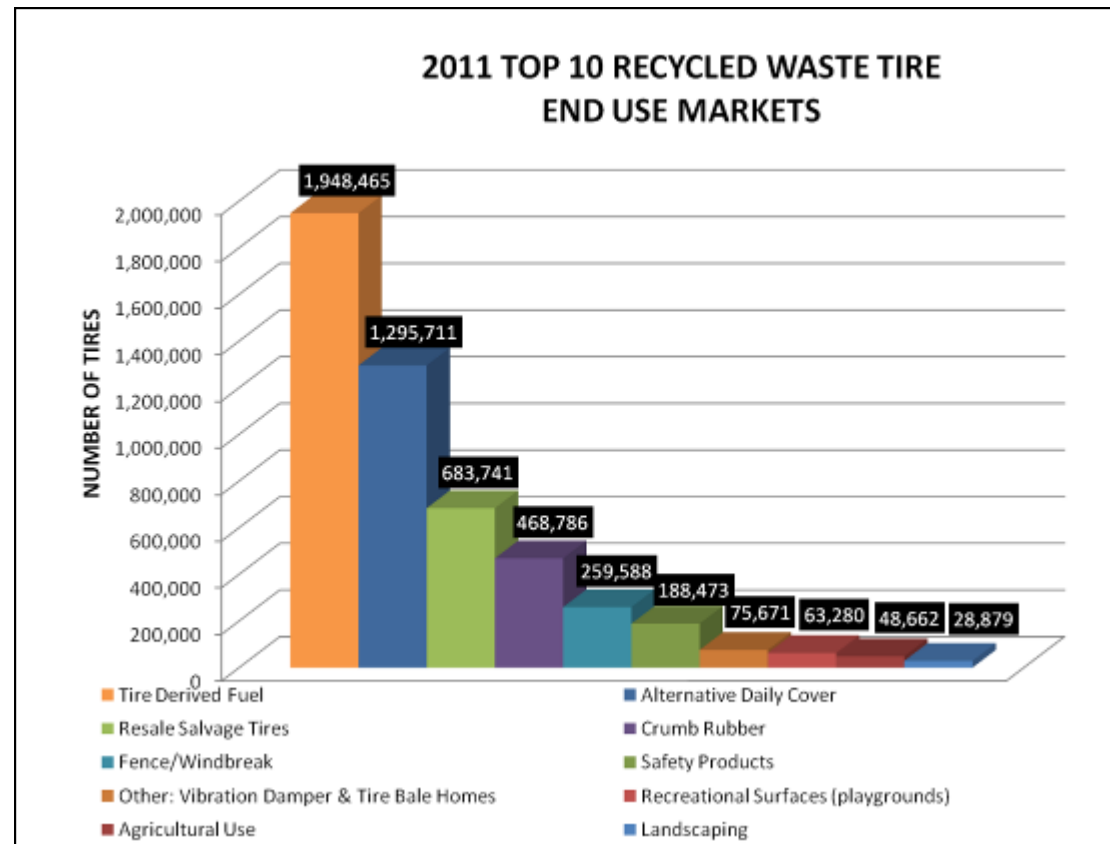


Figure 3

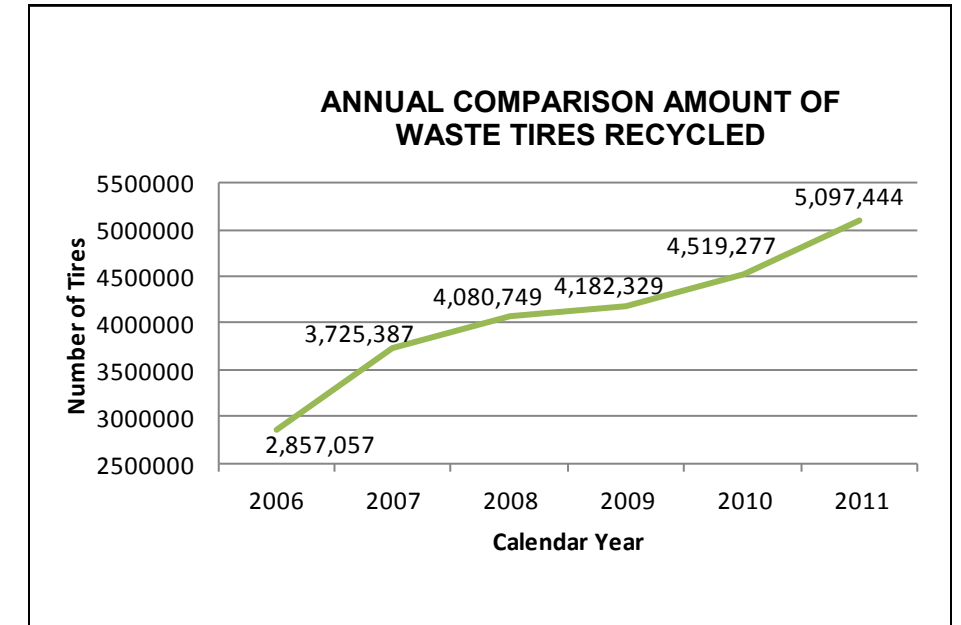


Figure 5

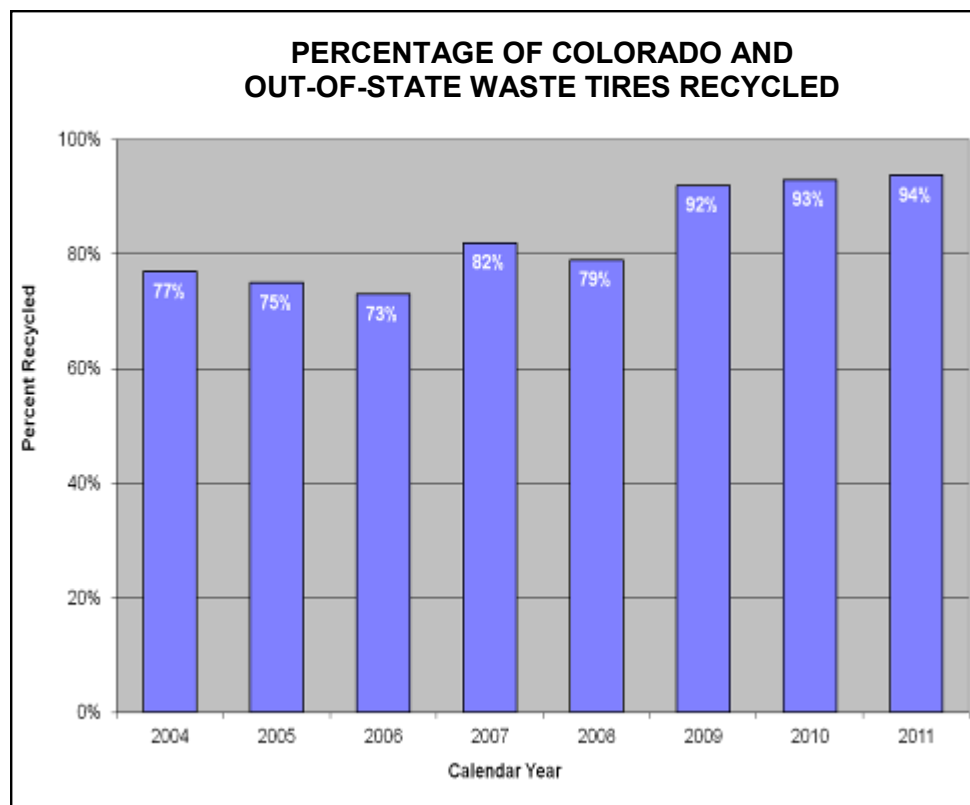


Figure 2



Figure 4

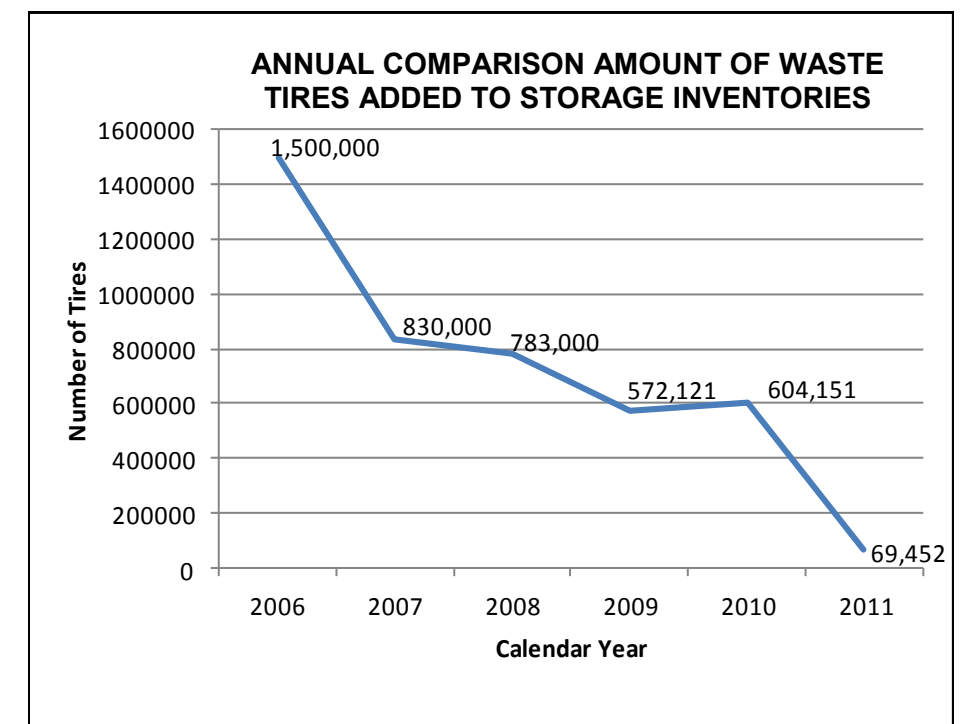


Figure 6

Waste Tire Update

Waste Tire Cleanup Fund Update

The Waste Tire Cleanup Fund provides funding for the cleanup of illegal or abandoned waste tire sites and offers incentives to use waste tires in public projects. Funds are split two-thirds for cleanup and one-third for incentives.

Counties and municipalities may apply for funding year round. The department works with counties and municipalities to ensure the sites fit the definition of “illegal” or “abandoned.”

Seven cleanups in six counties were completed in 2011. The total cost was \$342,157 with a total of 147,826 illegal or abandoned waste tires removed (see chart below). Cleanup project costs can vary among sites depending on where the cleanup site is located, the site’s topography, and if tires are above ground or buried.

Grantee Name	Funds Spent for Cleanup	Tires Removed
Conejos County	\$50,000	5,800
Larimer County	\$49,938	17,265
Fremont County	\$30,250	7,559
El Paso County (2 sites)	\$10,104	8,154
Mesa County	\$155,765	25,000
Arapahoe County	\$46,100	84,048
Total:	\$342,157	147,826

Processor & End User Fund Update

Funds for the beneficial use of waste tires are available to both processors and end users. Monthly reimbursements are based on approved tons and available funding.

From January through June 2011, \$710,857 was reimbursed for 24,987 approved tons (processed and end used). From July through December 2011, \$2,404,941 was reimbursed for 27,000 processed approved tons and 19,864 end used approved tons.

The passage of 6 CCR 1007-2 on July 1, 2011 changed the reimbursements calculation to a 2:1 ratio of end-used waste tires to processed waste tires.

'Seven cleanups in six counties were completed in 2011. The total cost was \$342,157 with a total of 147,826 illegal or abandoned waste tires removed.'

Recycling Incentives Update

The Waste Tire Cleanup Fund also incentivizes the use of Colorado waste tires in public projects to promote tire-derived products around the state. Projects include playground surfacing, athletic fields and infill for existing recycled turf surfaces.

During 2011, 11 recycling incentive grants in seven counties were completed. The total amount awarded was \$612,044, using 112,301 waste tires (see chart below).

Organization	Funds Spent on Project	Tires Used (approx.)
Adams State College	\$65,812	26,000
Lewis Palmer School District #38	\$10,930	1,840
Cheyenne Mountain School District 12 (3 projects)	\$218,096	25,827
City of Evans	\$39,163	7,035
Pueblo County School District	\$77,555	7,390
Town of Severance	\$49,057	6,003
Centennial School District R-1	\$66,281	11,675
Liberty J-4 School District	\$45,150	8,931
City of Aspen	\$40,000	17,600
Total:	\$612,044	112,301

Meet the Waste Tire Program Staff

Charles Johnson

Charles Johnson is the Solid Waste and Materials Management Program Manager at the Colorado Department of Public Health and Environment. Charles has worked with the Hazardous Materials and Waste Management Division since 1991. He has issued hazardous waste operating and post-closure permits and provided oversight for corrective action site inspections and characterization, remediation, and post-closure care projects. Charles has presented at conferences and was an instructor for ITRC courses on alternative landfill technologies and ecological reuse. Charles is the current ASTSWMO Subtitle D Task Force Chair and a member of SWANA. He earned a bachelor's degree in geology from the University of Texas in Austin in 1980, a master's in geology from Texas A&M in College Station in 1983, and a master of science in civil engineering from the University of Colorado in Denver in 1992. Charles may be reached at: (303) 692-3348 or charles.johnson@state.co.us.

Shana Baker

Shana Baker is an Environmental Protection Specialist for the Hazardous Materials and Waste Management Division. Shana has been with CDPHE since 2003. She works in the waste tires and waste grease arenas in the Solid Waste and Materials Management Program and was involved in the development and promulgation of the regulations related to waste tires, waste grease and medical waste. Shana is involved in public educational outreach, compliance assistance, regulatory compliance/enforcement, data management, and waste tire fire and law enforcement grant funding. She is a graduate of Colorado State University with a bachelor of science degree in environmental health and has a master's degree from the University of Denver in environmental policy and management (environmental health and safety concentration). Shana may be reached at: (303) 692-3305 or shana.baker@state.co.us.

Nick Boudreau

Nick Boudreau is an Environmental Protection Specialist for the Hazardous Materials and Waste

Management Division. Nick has been with the department since February 2011. Among his responsibilities are the development and promulgation of the waste tire solid waste regulations related to House Bill 10-1018 - Waste Tire Facilities and Waste Tire Haulers and waste grease regulations related to House Bill 10-1125 - Waste Grease Facilities, Transporters and Personal Users of Grease. His duties also include public educational outreach, compliance assistance and regulatory compliance/enforcement, data management, and waste tire fire and law enforcement grant funding. He is a graduate of Illinois State University with a bachelor of science degree in environmental health. Nick may be reached at: (303) 692-3459 or nicholas.boudreau@state.co.us.

Brian Gaboriau

Brian Gaboriau is a Waste Tire Grants Administrator in the Division of Environmental Health and Sustainability. Brian has been with the department since August 2008. Brian's responsibilities include the development and promulgation of the waste tire processor and end user reimbursement regulations related to House Bill 10-1018, managing the Waste Tire Cleanup, Recycling Incentives, and Market Development Grant Funds and reimbursements for the Processor and End User Program. He is a graduate of the University of Northern Colorado with a bachelor of science degree in business administration (management) and Regis University with a master of business administration degree in international business. Brian may be reached at: (303) 692-2090 or brian.gaboriau@state.co.us.

Waste Tire Resources on the Web

Waste Tires Home Page:

www.cdphe.state.co.us/hm/wastetires

Waste Tires Forms:

www.cdphe.state.co.us/hm/sw/swforms.htm#tire

Grants and Incentives:

www.cdphe.state.co.us/oeis/wtprog/wastetire.html

Waste Tire Legislation

Two bills were passed during the 2005 legislative session that directly affected the management of waste tires in Colorado. The Waste Motor Vehicle Tire Hauler Act (HB 05-1126) required the registration of commercial transporters of waste motor vehicle tires. The intent of this legislation was to ensure transportation and delivery of waste tires to proper storage and recycling facilities and to minimize the illegal dumping of tires.

Senate Bill 05-141 regulated the disposal of residentially generated waste tires. Effective July 1, 2007, this bill limited the disposal of residentially generated tires in landfills.

Senate Bill 09-289 was passed during the 2009 legislative session. Among other things this bill reallocated collection of the tire fee to the point of sale at tire retailers instead of the point of disposal, thereby improving collection of the funds. This bill also required facilities to use only commercial tire haulers registered with the state to transport waste tires, required the state to develop a plan for the elimination of tire monofills within 10 years, and required the department to implement an outreach and education program for facilities handling tires. The combined result of this bill was to ensure waste tires were commercially transported to appropriate facilities, and that more of these tires were ultimately recycled.

House Bill 10-1018 provided a cradle-to-grave or cradle-to-cradle regulatory approach for waste tires. This bill specified new registration, decal and manifest requirements for waste tire haulers and waste tire facilities. The bill also required waste tire



monofills to submit an inventory reduction plan to the department as a part of the facility Certificate of Designation. House Bill 10-1018 placed administrative authority for the waste tire funds with the department, and allocated resources for new personnel to manage the fund and provide program enforcement.

House Bill 10-1018 transferred oversight of the Processor and End User, Illegal Waste Tire Cleanup, and Recycling Incentive Funds from the Department of Local Affairs to the department's Division of Environmental Health and Sustainability. HB 10-1018 also created three new funds: the Waste Tire Market Development, Waste Tire Fire Prevention, and Law Enforcement Funds, which are also administered by the department.

New regulations went into effect April 1, 2011, to implement the requirements of HB 10-1018 by setting up a cradle-to-grave or cradle-to-cradle management construct for waste tires to ensure that all newly generated waste tires are accounted for and properly recycled or disposed. The regulations set out the requirements for each type of facility or entity within the waste tire lifecycle — tire retailers and wholesalers that generated waste tires as they replace old tires with new tires on vehicles; waste tire haulers and waste tire collection facilities that manage waste tires in transit; waste tire processors and end users that either manufacture waste tires into new products or turn waste tires into useable feedstocks; and waste tire monofills that store waste tires for extended periods. Regulations governing the Processor End User Fund also went into effect on July 1, 2011.

Accomplishments and Results

Calendar 2011 was a busy year for the Waste Tire Program. Hazardous Materials and Waste Management Division (HMWMD) and Division of Environmental Health and Sustainability (DEHS) Waste Tire Program staff were involved in the development of two new waste tire regulations. The Solid and Hazardous Waste Commission passed new regulations resulting from the passage of HB10-1018, for Waste Tire Facilities and Waste Tire Haulers and administration of the Waste Tire Processors and End User Reimbursement Program on Feb. 15, 2011 and May 17, 2011, respectively. The department actively engaged waste tire stakeholders during the development of both regulations. Stakeholders included representatives from the Rubber Manufacturers Association, waste tire haulers, waste tire processors, waste tire end users, waste tire monofills, local health departments, local law enforcement officials, and state and local fire agencies. Waste Tire Program staff continue to engage in various outreach efforts to inform the waste tire community of the new regulations and the Waste Tire Program, including conducting compliance assistance outreach visits and inspections at waste tire facilities and giving waste tire presentations to local code enforcement officers and county health inspectors and officials.

The department used various methods to provide information to tire retailers and wholesalers, waste tire haulers, waste tire processors, waste tire end users, and waste tire collection facilities of the new Waste Tire Facilities and Waste Tire Haulers regulations. In March 2011, the department mailed more than 1,400 postcards notifying recipients of the new regulations and registration requirements. This effort, along with working with waste tire haulers to notify waste tire generators of the new registration requirements, resulted in 1,255 businesses that either generate, collect, store, process, and/or use waste tires registering with the department in 2011. 2011 registration numbers were:

- Waste tire generators (tire retailer, wholesaler or fleet service facility): 1,214
- Waste tire haulers: 56
- Waste tire collection facilities: 15
- Waste tire processors: 10
- Waste tire end users: 2
- Waste tire monofills: 3

A website dedicated to waste tires was created by the HMWMD and DEHS to provide information to



Waste tire registration decals: Left - Waste Tire Hauler decal. Right - Waste Tire Facility decal.

the waste tire community and general public. These two websites have the following waste tire content:

- Waste tire regulations.
- Information and applications for the Illegal Waste Tire Cleanup, Recycling Incentives, Processor and End User, and Waste Tire Market Development Funds.
- Waste tire forms including the Waste Tire Certificate of Registration Form (Form WT-1) that can be completed and submitted online, the Uniform Waste Tire Manifest Form (WT-2), and an online complaint form.
- A listing of currently registered waste tire haulers and waste tire facilities.
- English and Spanish guidance documents.
- Information regarding development of a waste tire abatement list.
- Waste Tire Advisory Committee information.

The HMWMD and DEHS waste tires websites experienced 9,568 web hits in 2011, with the HMWMD website receiving 6,258 web hits and the DEHS website receiving 3,040 hits. Additionally, waste tire registrants used the HMWMD website to submit 1,043 Form WT-1's online.

Waste Tire Advisory Committee

The Colorado Waste Tire Advisory Committee (the committee) was created by House Bill 10-1018 in the 2010 legislative session. The committee consists of nine members: one member from the department and the other eight members appointed by the Governor with one member representing each of the following: law enforcement from jurisdictions that have a waste tire facility, local fire authorities that have a waste tire facility within their jurisdiction, tire retailers, tire end users, tire manufacturers, waste tire haulers, waste tire processors, and waste tire monofills. Each member serves a three-year term.

The committee is required to meet at least quarterly and more frequently as needed. In 2011, the committee met each month, except May 2011. The last 12 months of committee meeting minutes, com-

mittee bylaws, upcoming meeting schedules, and committee appointed members is available at: www.cdphe.state.co.us/hm/wastetires/advisory.htm.

These individuals have been appointed by the Governor to the committee and represent the following:

- Joel Bolduc, Waste Tire End Users
- Christopher (Chris) Houtchens, Waste Tire Haulers
- Larry Hudson, Tire Manufacturers
- Charles Johnson, CDPHE
- Trent Peterson, Waste Tire Monofills
- James (Jim) Reid, Local Fire Authorities
- Michael (Scott) Skorka, Tire Retailers
- Richard (Rick) Welle, Waste Tire Processors
- Vacant, Law Enforcement Authorities

2011-2012 Waste Tire Advisory Committee Members



From top left: Trent Peterson, Charles Johnson, Joel Bolduc, Rick Welle, Chris Houtchens. From bottom left: Scott Skorka, Jim Reid. Not pictured: Larry Hudson.

Waste Tire Facts and Facility Information

Waste Tire Statistics

In 2011, using waste tires as tire-derived fuel replaced the use of 68,810 tons of coal, or enough energy to power 10,928 homes for one year, and preserved 1,250 acres of forest from deforestation.¹



Using waste tires as tire-derived fuel results in lower nitrogen oxide (NO_x) emissions when compared to many US coals. ²



Nationally, more than 84.9 percent of waste tires are recycled or beneficially used for fuel or other applications.³



¹United States EPA “Greenhouse Gas Equivalencies Calculator” updated June 2011

³United States EPA “Tire-Derived Fuel” updated October 2011

³Rubber Manufacturing Association “U.S. Scrap Tire Market 2009 Summary” 2011

