

**Answers to Questions not addressed during the
EPA Region 8 Scrap Tire Reuse & Recycling Webinar, February 23, 2010**

Engineering/Technology

Q: In the tire shredding process, what is the standard management for the steel from the tire?

There is no standard for management of steel. Generally, there are two ways to deal with steel: Process the tire efficiently enough so the steel (wire) is free of rubber and fluff and send it to a steel recycling yard (typically the steel needs to be baled, but how the steel is shipped and the amount of acceptable rubber on the steel is based on the agreement between the tire processor and the steel mill). If the tire processor is not efficient then the steel, with rubber still on it, is landfilled. [Michael Blumenthal, Rubber Manufacturers Association]

When steel is removed during efficient processing, massive magnets are used during multiple grinding stages in the process of size reduction. Then it is usually baled and sent to the steel mill. [Mark Schuknecht, U.S. EPA]

Q: Has a benchmark of devulcanization technologies been made for ground rubber?

No. To the best of the Rubber Manufacturers Association's (RMA) knowledge, there are no commercially viable devulcanization operations in the U.S. [Michael Blumenthal, Rubber Manufacturers Association]

Q: Where can I get the quickest education on the new pyrolysis and gasification systems that are out there and are accepted and effective conversion of tires to reusable products?

At present, there is no large-scale, commercially viable pyrolysis or tire gasification operations in the U.S. There is general information on these technologies on the RMA website (www.rma.org/). There is a report from the State of California that sums up this situation well. If you can not find it on our web site (www.rma.org/), send me an email at mblumenthal@rma.org and I will forward the report to you. [Michael Blumenthal, Rubber Manufacturers Association]

We don't believe there is a good answer. As far as we can tell, despite many attempts there are no such systems that have achieved steady-state commercial scale operations in the U.S. Most of the technologies being tried out today are proprietary and still under development. [Mark Schuknecht, U.S. EPA]

Markets

Q: Tire mulch does not provide nutrients to plants and would not be as healthy for the plant community as organic matter. Have you considered promoting tire mulch as a cover for compost as a soil amendment?

Tire shreds are well accepted as a landscaping/mulch product, even though they are not an organic material and do not provide nutrients. Tire mulch does keep moisture in (the soil) and does not let weeds settle in. There have been a couple of attempts to use tire chips as a bulking agent in composting, but those experiments did not work out so well. [Michael Blumenthal, Rubber Manufacturers Association]

Tire mulch is being successfully used for plants where the nutrient needs are being taken care of by other means. The application has to be chosen carefully since zinc compounds in particular are known to leach from the rubber mulch into the plants' root zone. While zinc is essential to plant growth as a micronutrient, it is generally effective in only very small amounts. The application of tire mulch on plants or as a component of compost should not be done without consideration of the specific conditions. Tire mulch may be used for other reasons than just nutrient value. Ground rubber has been used by some soil amendments, as a bulking agent, or to increase infiltration or to promote drainage. Its primary use is for aesthetic value or to retard weed growth. [Mark Schuknecht, U.S. EPA]

Q. How do we increase the demand for molded products made in the U.S. from scrap tires? Small businesses make great products, but not many buyers, hard for the manufacturers to stay in business...

The Rubber Manufacturers Association (RMA) sponsors the "From Scrap-to-Profit" conference (<http://www.scraptoprofit.com/>). The next one will be held November 3 – 4, 2010, in Little Rock, Arkansas. This is one of the topics that we cover in detail. To answer the question, it's a function of several activities, depending on the product.

In general, the product has to have the same (or better) performance characteristics as what it is competing against. If there is an industry or national standard for that class of products, then your product has to meet those standards. We have several PowerPoint presentations from previous Scrap-to-Profit conferences. If you are interested in seeing those presentations, send me an email (mblumenthal@rma.org) with that request. [Michael Blumenthal, Rubber Manufacturers Association]

This is the central question to increasing ground tire rubber recycling: Providing good value for the price and educating the buyers. [Mark Schuknecht, U.S. EPA]

Q: Can tires be used as cover in Federal (Corp.) lakes as cover? Is there a system in place for construction of fish cover using tires in federal impoundments?

I am not aware of any restrictions, but I would suggest checking with the appropriate federal agency. There are engineering plans for building artificial reefs from scrap tires on the Rubber Manufacturers Association (RMA) website at www.rma.org/. One word of caution: while tire reefs are effective they also tend to be rather expensive to construct. [Michael Blumenthal, Rubber Manufacturers Association]

I am unsure about this question and whether it is referring to the creation of artificial reefs. Tires tend to be marginally buoyant in water; that is, they tend to migrate and the bales break apart. Clean up of broken apart tire reefs in Florida has been expensive and difficult. Could this question be referring to this youtube clip? <http://www.youtube.com/watch?v=GqRxj3Cg8xY> [Mark Schuknecht, U.S. EPA]

Q: We have a tire recycling plant in Region 9. What/where can we get similar information in the State of California?

I suggest contacting Sally French at CalEPA (Department of Resource Recycling & Recovery) at sfrench@ciwmb.ca.gov. [Michael Blumenthal, Rubber Manufacturers Association]

Q: A list of current tire recycling facilities by state would have been great. Where can we take the tires?

There is a booklet called “The Scrap Tire & Rubber Users Directory” that contains just such information. Go to www.scraptirenews.com and find the offer for that booklet. [Michael Blumenthal, Rubber Manufacturers Association]

Some other on-line resources are available including NY:
<http://www.esd.ny.gov/BusinessPrograms/SecondaryMarketInfo.html>. [Mark Schuknecht, U.S. EPA]

Product Stewardship

Q: What is the RMA doing in the area of extended producer responsibility (EPR) or product stewardship? What are they doing to require extended producer?

The Rubber Manufacturers Association (RMA) is committed to the concept of shared responsibility; all stakeholders that are involved with the tire have some level of responsibility in the management of the tire. The tire manufacturers, through the RMA, have been actively working on scrap tire issues for the past 20 years. We provide information on all aspects of scrap tire management, have been active in getting states to create a funded tire program, assisted with development of large-scale markets for scrap tires, and provide information to all interested in this topic. RMA is not advocating for EPR. The indications we have obtained from most states is that they are not advocating for an industry EPR program. [Michael Blumenthal, Rubber Manufacturers Association]

Tribal

Q: What assistance would be offered to Tribes?

The Rubber Manufacturers Association (RMA) will provide the same training courses to tribes as it offers to any other potential user of scrap tire products. Examples are workshops on the use of tire derived aggregate or business

development (among others to be sure). Please send me an email at mblumenthal@rma.org and explain what you are interested in. [Michael Blumenthal, Rubber Manufacturers Association]

The Tribes can use the Scrap tire Workgroup as a valuable resource for information, advice, and contacts within the industry. The Workgroup Website is www.epa.gov/epawaste/conserva/materials/tiresworkgroup.htm. [Mark Schuknecht, U.S. EPA]

Also, any assistance would be specific to the needs requested from the tribe. Contact Charles Bearfighter RedDoor, the EPA National Tribal Programs Coordinator, at (703)308-8245, or reddoor.charles@epa.gov. Visit the tribal program website at <http://www.epa.gov/tribalmsw>. [Charles RedDoor, U.S. EPA]

Q: We have a lot of tires on the reservation and are looking for a way to get rid of them. Is there a scrap tires resource or contacts in EPA Region 9 for tribes?

The EPA Region 9 contact for the tribes is Heather White @ white.heather@epa.gov. For information specific to California, contact the California Integrated Waste Management Board (CTWMB) or the Department of Resources Recycling and Recovery (CalRecycle) @ <http://www.calrecycle.ca.gov/>. CalRecycle is the new home of California's recycling and waste reduction efforts. CalRecycle is a new department with the California Natural Resources and administers programs formerly managed by the State's Integrated Waste Management Board and Division of Recycling. Their website offers information on programs that are important to the long-term vitality of California's environment and economy. [Charles RedDoor, U.S. EPA]

Cara Peck is the Region 9 contact on the Scrap Tire Workgroup (peck.cara@epa.gov). [Mark Schuknecht, U.S. EPA]

Jeffrey A. Dhont, (415) 972-3020 or dhont.jeff@epa.gov, is the contact for industrial materials recycling at EPA Region 9 and may also be a resource for you. The issue of tires on reservation is somewhat sensitive. State scrap tire laws are not enforceable on reservations, and it is the Rubber Manufacturers Association's (RMA) understanding that state abatement projects are not fundable on reservations (since they are exempt from the state program). Having said that, you may want to contact the Bureau of Land Management (BLM) to see what resources they have. The second part of the question is whether the tires on the reservation were generated on the reservation or were they allowed to be brought onto the

reservation (arguably for profit). If that is the case, it is my understanding that those tires would be the responsibility of the reservation. If the tires were unlawfully dumped on the reservation, then I would check with the state's solid waste agency to find out if you would be eligible for abatement funds. [Michael Blumenthal, Rubber Manufacturers Association]

Q: I work in the tribal program where scrap tires are a major issue for tribes. This webinar has talked about a great deal of viable options for tires. An option I would like more info on is the market and vendors to buy the scrap tires or at least get them off the reservations.

It is very unlikely that anyone will buy the scrap tires on your reservation. Please see the answer to the previous question. Depending on the source of the tires, you may want to contact the Bureau of Land Management (BLM) to see what resources they have, or the state's solid waste agency to find out if you would be eligible for abatement funds. [Michael Blumenthal, Rubber Manufacturers Association]

Inquire with your Regional Tribal Programs Manager to inquire if GAP funding is available to develop a Waste Tire Management Plan and Waste Tire Program. [Charles RedDoor, U.S. EPA]

Q: I have a concern. Everyone has talked about state funding. What about funding for Tribes?

I would suggest this is a larger issue than just tire fees for scrap tires. My understanding is that tribes are exempt from most state scrap tire programs, and as such, would not be eligible recipients for state scrap tire funds. [Michael Blumenthal, Rubber Manufacturers Association]

Check your State Waste Tire Management System to search for databases listing registered waste tire haulers as well as end-use facilities. An example for the Tire Haulers in the State of Colorado is: <http://www.scraptire.net/america/index-colorado.html>. [Charles RedDoor, U.S. EPA]

Mexico Border

Q: Are there different goals to address special problem areas like the Tijuana River Valley - where tires wash across the border from Mexico into the U.S. with each rain storm? I assume there are special needs areas along other stretches of the border.

The “need” along the entire border area is one of developing viable end use markets and for the Mexican states to develop a comprehensive regulatory program (the four U.S. states have regulations). The situation in the Tijuana River Valley is different because it’s one of the few places where scrap tires are coming back to the U.S. At present I doubt that can be stopped. What would help the situation would be for the new scrap tire processing facility in San Diego to get running so those tires can be brought there and processed. [Michael Blumenthal, Rubber Manufacturers Association]

Through the U.S.-Mexico Border 2012 Program (Border 2012), EPA and the Secretariat for the Environment and Natural Resources (SEMARNAT), are working jointly to clean the border’s scrap tire piles and to find efficient and environmentally sound options for using them. Originating from the 1983 La Paz Agreement, Border 2012 is a results-driven partnership between the United States and Mexican federal, state, local governments, and U.S. tribes to protect public health and improve environmental conditions along the U.S. – Mexico border. Through Border 2012, EPA and SEMARNAT promote partnerships with industry, academia, and local and state governmental entities as they clean up tire piles (over 4 million scrap tires were eliminated from 2003 to 2009) and take steps to prevent further tire piles. Such steps include developing a guide, a border-wide inventory of tire piles, a compendium of border scrap tire projects, and an ongoing multi-stakeholder group that meets annually to collaborate in finding solutions.

With specific regards to the Tijuana River Valley, California recently passed Bill 167 by Senator Denise Moreno Ducheny that now allows California tire fees on new tires purchased to be used in the Mexico border region. “The bill would, additionally, require the 5-year plan to include, as a border activity, the development of projects in Mexico in the California-Mexico border region, including education, infrastructure, mitigation, cleanup, prevention, reuse, and recycling projects that address the movement of used tires from California to Mexico that are eventually disposed of in California.” Additional resources and publications can be found on the Border 2012 Waste Policy Forum website, at <http://www.epa.gov/usmexicoborder/fora/waste-forum/index.html>. [Ellie Kanipe, U.S. EPA]

Q: Border communities often have to deal with a used tire market. How has work with Mexico played out?

To date, not to the level we had hoped for. The basic problem is that a large number of used tires are imported into Northern Mexico. This causes an unusually high level of scrap tire generation. With the lack of regulations, legislation, a viable scrap tire collection and processing infrastructure and few markets, the result has been the existence of large-scale stockpiles. Many of these stockpiles have been abated, but little to no attention has been spent on what is needed to create a viable scrap tire industry. [Michael Blumenthal, Rubber Manufacturers Association]

Scrap tires pose a problem to both the U.S. and Mexico. In Mexico, the Mexican Ministry of Environment and Natural Resources (SEMARNAT) estimates that about 40 million used tires are generated annually. However, the scrap tire problem is heightened in the U.S.-Mexico border region. There are 46 known tire piles in the U.S.-Mexico border region (defined as 100 km on each side of the 2,000 miles long border), according to the Border 2012: U.S.-Mexico Border Scrap Tire Inventory Summary Report (May 2007). Throughout the entire border region, scrap tires are stockpiled at municipal solid waste landfills; small businesses' properties and other privately or publicly owned properties. In 2008, the largest tire pile was located near Ciudad Juárez with over four million tires.

The scrap tire problem is fueled by the current economic situation in the U.S.-Mexico border region. The Northern Mexican border imports millions of used tires from the U.S. for reuse. Due to their lower cost, approximately half of all tire purchases in Mexican border cities are used tires from the U.S. Because they are used tires with generally 10,000-20,000 miles of use, they have a shorter shelf life than new tires. For these reasons, the tire problem in the border region is significant. In Mexico, scrap tires are governed under the 2004 "General Law for the Prevention and Integral Management of Waste." Under this law, every major generator of waste, including municipalities and industrial facilities, are required to develop integrated waste management plans. Scrap tires are "special management waste" under this law, and, therefore, require an integrated waste management plan. Although the majority of scrap tires in Mexico that are processed or recycled are used as TDF, Mexicans also use tires in a variety of civil engineering applications. There is a ground rubber facility in Ciudad Juárez; cement kilns in Baja California, Sonora, Chihuahua and Monterrey; and a crumb rubber paving pilot project in Ciudad Juárez. Contact Ellie Kanipe at kanipe.ellie@epa.gov for more information on the Mexican border project. [Ellie Kanipe, U.S. EPA]

Q: So, with Mexico you only have programs in the border of our countries?

No. The Rubber Manufacturers Association (RMA) has worked with government agencies and industries in several non-border areas in Mexico. We spend a considerable amount of time on the border region because of the number of scrap tires that are there, but we would be glad to work with other states, regions or industries throughout Mexico. [Michael Blumenthal, Rubber Manufacturers Association]

EPA works closely with its counterpart, the Secretariat for the Environment and Natural Resources (SEMARNAT) under Border 2012 to achieve six broad goals and twenty-six specific and measurable objectives to improve the region's environment and protect the health of its residents. One of Goal 3 objectives is to Reduce Land Contamination that address the scrap tire problem. The objectives of this goal are to:

- By 2010, clean up three of the largest sites that contain abandoned waste tires in the U.S. Mexico border region, based on policies and programs developed in partnership with local governments.
- By 2012, develop capacity building materials for scrap tire pile prevention and scrap tire management.
- By 2012, address recommendations from the 2006 U.S.-Mexico Border Scrap Tire Integrated Management Initiative which defines the principles and actions necessary for sustainable scrap tire management, one of which is market development.
- When practicable, clean up small tire piles, at least once in each of the four regional workgroup geographic areas.

[Ellie Kanipe, U.S. EPA]

Q: Are there any limitations you are aware of on exporting scrap tires into Mexico for use as tire-derived fuels?

Mexico federal law prohibits the importation of scrap tires into Mexico, though the states of Baja California and Chihuahua are given an annual import quota of 1,000,000 used tires (defined as tires with more than 15/32" tread). Mexican law permits one million used tires to be imported across the border each year, which are reserved for the ports of entry in the states of Baja California (Tijuana and Mexicali) and Chihuahua (Ciudad Juárez). However, anecdotal information suggests that another million more may enter Mexico without proper authorization each year. The Secretariat for the Environment and Natural Resources (SEMARNAT) estimates that in 2003, only 9% of scrap tires were reused or disposed of in any other way than scrap tire piles. Border scrap tire resources and publications can be found on the

Border 2012 Waste Policy Forum website, at <http://www.epa.gov/usmexicoborder/fora/waste-forum/index.html>. [Ellie Kanipe, U.S. EPA]

Air Emissions

Q: The use of supplement energy in kiln cement is clean?

Yes. The use of either whole and/or processed tire-derived fuel is considered a clean and safe fuel not just in cement kilns, but in all the combustion facilities it is used in. The Rubber Manufacturers Association (RMA) website has a series of air emission reports that can be downloaded (at no cost) – see www.rma.org/. In general, TDF has 25% greater heating value than coal, so TDF burns hotter than coal. This causes a more complete combustion and often yields lower emissions. [Michael Blumenthal, Rubber Manufacturers Association]

The balance of emissions without tires and with tires is about the same, as some parameters go up, and some go down. Usually, NOx goes down, depending on the kiln design. Cemex just completed their testing in Louisville, and CEMEX said that it passed the Louisville-Jefferson Co. Air Pollution Control District STAR program, the most stringent in the nation. In their case, some went up, some down, but overall about the same. NOx was about the same. [Mark Schuknecht, U.S. EPA]

Human Health

Q: What documentation do we have of actual risk of infectious disease from insects breeding in tires?

It is generally accepted that mosquitoes breed faster (more efficiently) in tires than they do in their natural habitat. There are no predators for mosquitoes, and the temperature inside a large pile is constant so mosquitoes can breed all year long. There are several references on the Rubber Manufacturers Association (RMA) website (www.rma.org/) that go into greater detail on this. [Michael Blumenthal, Rubber Manufacturers Association]

It is interesting to note that the Asian Tiger Mosquito (*Aedes albopictus*) was first spotted in August, 1985, in Houston, Texas, arriving as a stowaway in a shipment of used tires sent from northern Japan for reprocessing [Nadakavukaren (1984), *Man & Environment: A Health Perspective*, 3rd ed.]. Gerald Schmidt and Larry Roberts in *Foundations of Parasitology* (1989), 4th ed., make reference to the mosquito's discovery in Houston, Texas, and say experimentally it is a good vector for dengue, equine encephalitis, yellow fever, and La Crosse virus. In general, it is well documented in many resources the habitat preferences for mosquitos. It is the container-dwelling mosquitos, like the Asian Tiger Mosquito, that like to breed in tires.

This mosquito has tested positive with West Nile Virus (WNV) in the U.S. According to the Maryland Department of Agriculture's (http://www.mda.state.md.us/plants-pests/mosquito_control/asian_tiger_mosquito_md.php#importance) Website:

“Tiger mosquitoes are known to transmit the causative agent of dog heartworm disease. In New Orleans, the tiger mosquito is a principal vector of dog heartworm. In Polk County, Florida, field populations of tiger mosquitoes were found to carry eastern equine encephalitis virus in 1991. In Asia, this species is a vector of dengue fever and Japanese encephalitis. Laboratory studies have found the tiger mosquito to be an efficient vector of many viral disease agents including yellow fever, West Nile virus, St. Louis encephalitis and LaCrosse encephalitis.

In 2001, tiger mosquitoes collected in Maryland, New Jersey and Pennsylvania tested positive for West Nile virus. *Aedes albopictus* is considered to be a vector of West Nile virus in Maryland.”

You may also want to visit the following references for more information about the Asian Tiger Mosquito, its breeding habitats, and disease transmission:

- “Asian Tiger Mosquito, a Recent U.S. Introduction - A Vector for Several Debilitating Tropical Diseases,” July 2009, http://flying-insects.suite101.com/article.cfm/asian_tiger_mosquito_a_recent_us_introduction
- Rockville, Maryland, Mosquito and West Nile Virus Information: <http://www.rockvillemd.gov/residents/westnile.htm>.
- You can also google the topic and find a lot of information about its breeding habitat and infectious disease transmission.

[Kendra Morrison, U.S. EPA]

Case Studies

Q: I would like to know about examples of cities/towns that implemented a reuse/recycling option and why they chose it. I am also interested in a summary about the financial commitment and benefits.

I am not sure I have anything that would satisfy as an answer. Generally, municipalities do not get directly involved in tire processing activities. There are, of course, some exceptions to that statement. In general, I would suggest that when/where a municipality actively pursues a program to abate the tire piles in the vicinity and purchases tire-derived products, there are two great benefits derived: removal of tire piles reduces mosquito infestation and purchasing tire-derived products on the open market helps develop a self-sustaining marketplace. The funds for abatement generally come from the state's scrap tire fund; while the purchase of tire-derived products should be part of a buy recycle campaign. [Michael Blumenthal, U.S. EPA]