Report to the Vermont Legislature

On

Problem Scrap Tire Piles

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Prepared by:

Solid Waste Management Program

Department of Environmental Conservation

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I. Authority and Scope:

Act 148, passed during the 2012 legislative session, substantially updates Vermont's solid waste management laws in an effort to reduce the ever-increasing generation of waste, and also to view waste as misdirected resources. Waste management then becomes "materials management." By striving to reduce the initial generation of waste, and to sustainably manage the residual "materials," Vermonters reduce pollution and greenhouse gas emissions, and save energy, natural resources, and landfill capacity.

The Act also requires the ANR to perform a number of assessments and evaluations, including a report on scrap tire management. The law specifically requires the ANR to submit a report that includes:

(1) An inventory of sites in the state where the secretary determines, in his or her discretion, that the disposal, management, or disposition of waste tires is a problem.

(2) An estimate of the number of waste tires disposed of or stored at the problem sites identified under subdivision (1) of this section.

(3) An estimate of how much it would cost to properly dispose of or arrange for the final disposition of the number of waste tires estimated under subdivision (2) of this section.

(4) An estimate of the amount of time required for the proper disposal or final disposition of the number of waste tires estimated under subdivision (2) of this section.

II. Background:

It is believed that approximately 300 million scrap tires are generated each year in the United States, or about one scrap tire per person per year.[1] Using this EPA and industry accepted rule-of-thumb, about 625,000 scrap tires are generated each year in Vermont.

Nationally, nearly half of the scrap tires collected are processed for Tire Derived Fuel (TDF) for use in cement kilns, industrial boilers, pulp and paper mills, and tire-to-energy plants. A growing market for scrap tires is as ground rubber for use in landscaping, playground surfaces, athletic field subsurfaces, and rubberized asphalt. The ground rubber market accounts for about one-quarter of all collected scrap tires. Conversely, a shrinking market is the use of shredded scrap tires in civil engineering applications, most notably as lightweight fill. Civil engineering uses account for only about 5% of the scrap tire market. Other minor markets include reuse of used tires, tires for agriculture uses, and punched or stamped products. Approximately 13% of tires are disposed of, which continues to be allowed in some states. In 2009, the industry trade group Rubber Manufacturers Association estimated that 98% percent of the scrap tires generated are legitimately managed.[2]

As with most commodities and recyclable materials, the market for scrap tires is volatile and greatly influenced by economic factors, energy prices, and political circumstances outside of Vermont and, increasingly, outside of the United States. As with any material, virgin or recycled, the market will exist wherever the price drives that commodity to, and given the dynamics of the scrap tire marketplace, the summary above represents only the current snapshot in time. As an illustration, as world crude oil prices recently rose appreciably, so did the export of U.S. tires to – particularly - Asia, for use as Tire Derived Fuel. Exports to China, through Vietnam, boomed in early 2011, drawing scrap tires from domestic markets, and decreasing the prices that recyclers charged scrap tire generators, in an effort to remain competitive. When China restricted scrap tire imports, the demand eased. However, it appears that South Korea may be beginning to import tires from the U.S. for the Chinese TDF market, again limiting the domestic supply for recycling.[3] What this situation points out is the complexity of the scrap tire management structure is and, pertinently, what a small part of that structure Vermont is.

The vast majority of Vermont's scrap tires are managed through tire retailers, with a lesser number managed by the generators themselves, Solid Waste Districts (1431 tons in 2011)[4], or individual towns around the State. Two large Vermont tire dealers anecdotally report that 90-95% of customers purchasing replacement tires choose to leave their scrap tires for the nominal fee.[5] There are no scrap tire processors, and nearly no users of whole or shredded scrap tires, located in Vermont. Consequently, all of the State's legitimately managed scrap tires are transported out of Vermont, and often out of the country, for reuse, processing or marketing. As such, once transported out of state, accurate tracking of what becomes of Vermont scrap tires is unachievable.

The number fluctuates over time, but there are currently nine permitted scrap tire collectors working in Vermont, although several of these entities are currently facing enforcement actions. These firms collect scrap tires generated by retail tire dealers, automotive repair shops, transportation related businesses, solid waste facilities, and other entities that accumulate sizable quantities of tires. Most scrap tire collectors will also perform cleanups of illegal or abandoned tire piles.

Retail tire dealers generally charge consumers a $2.00-$4.00 per tire fee to manage used passenger car and light truck tires. In turn, scrap tire collectors charge the tire dealer $1.00-$1.25 per tire to transport the scrap tires for processing (or, at an accepted average of 100 tires per ton, $100.00-$125.00 per ton). Tire dealers with enough throughput will often utilize a tire collector's box trailer for scrap tire storage. With normal loading, a standard 53' trailer will accommodate approximately 1000 tires and, again, cost the tire dealer about $1000-$1250 to have shipped off. A collector having to load tires from a stockpile into a container will charge an extra handling fee.

A precise account of what becomes of Vermont's legitimately collected scrap tires is infeasible, as the receiving out-of-state processors are free to determine the most profitable market. It appears, however, that the percentage of Vermont tires processed and utilized as TDF is higher than the national average, and may approach 2/3 of the scrap tires generated in-state. Regional facilities that burn tires for fuel include cement kilns in Quebec and New York, paper mills in Maine, and a Tire-to-Energy plant in Connecticut. Civil engineering projects utilizing shredded tires are waning nationwide, and no such recent projects have occurred in Vermont. Some smaller percentage of Vermont tires are likely processed for use as ground rubber, particularly as landscaping media, but one of the major uses, as a component of rubberized asphalt, is not commonplace in New England.

Not only are unmanaged scrap tire stockpiles unsightly, the stockpiles present a threat to human health and the environment for several reasons. They provide an ideal breeding ground for mosquitoes, which can carry and transmit life-threatening diseases such as dengue fever, encephalitis, and the West Nile virus. Stockpiles may also catch fire as a result of lightning strikes, equipment malfunctions, or arson. The longer a stockpile is unabated, the more likely it is to catch fire, and tire fires are notoriously difficult to extinguish. In addition to emitting dense, black, noxious smoke, some tire fires produce large quantities of pyrolytic oils, containing hazardous compounds. These oils can enter and contaminate groundwater and surface waters, leading to expensive remediation efforts.

References:

1. U.S. Scrap Tire Management Summary, Rubber Manufacturers Association (RMA), Washington, DC, October 2011 and Scrap Tire Update, RMA, May 22, 2012.

2. Ibid.

3. Mark Hendricks, Exports Produce Scrap Tire Shortage, American Recycler, October 2012, pp. 1, 4.

4. Vermont Agency of Natural Resources, Quarterly Facility Reports, 2011

5. T. Sheenan, Vianor Tire, and M. Rochefort, Vermont Tire and Service, personal communications, December 2012.

III. Vermont Scrap Tire Pile Inventory

The Vermont Solid Waste Management Program requires that certified solid waste facilities submit quarterly or yearly reports on the quantities and types of waste managed, including tires. By statutory interpretation, scrap tires that are recycled are exempt from the $6.00/ton solid waste facility franchise fee, while those that are burned as TDF are not. As such, solid waste facility owners must report – to the best of their knowledge – the final disposition of the collected and shipped from their facilities. The Program also requires permits for all commercial haulers of solid waste (including tires) that utilize greater than one-ton capacity vehicles. Tire haulers report quantities hauled only if the franchise fee applies; that is if the scrap tires are utilized as fuel.

Over the years, the Agency has had several enforcement actions that involved illegal transportation, stockpiling, or disposal of scrap tires, most notably and recently, the action involving the Rhodes Junkyard in Milton. However, prior to the effort made in support of this report, the ANR has not attempted to comprehensively inventory unauthorized scrap tire piles.

IV. Methodology

In order to begin to inventory "sites…that the disposal, management, or disposition of waste tires is a problem," the Agency first needed to define "problem." To that end, it was decided as the first criteria, that problem sites were stockpiles greater than 100 tires. No tire piles that met the minimum size criterion were initially excluded on any other basis. Once a tire pile became known – as further explained below – the Agency endeavored to determine whether the pile was associated with a certified solid waste facility, tire dealer or other automobile-related business, farm, or some other legitimate application, or if the tire pile was unauthorized and appeared problematic.

The ANR developed an on-line survey by which citizens could report tire piles that they were aware of. The survey was sent directly to all Vermont city and town managers, selectboards, planning and zoning staff, and conservation commissions. The survey was also sent to all Vermont fire departments, fire wardens, game wardens, environmental enforcement officers, and environmental advocacy groups. The survey was publicized on the ANR website, by a press release, and was covered in one well-distributed newspaper. The survey requested, if known, the location of the tire pile, pile owner's name, estimated size range of the pile (100 - 200 tires, 201 - 1000 tires, 1,001 - 10,000 tires, or greater than 10,000 tires) time frame of the pile's existence, and whether the tire pile is growing. The survey remained open from mid-June through mid-September 2012, and was responded to by citizens in all regions of the State. Phoned-in reports were also accepted and included in the inventory.

In addition to the results of the on-line survey, the inventory includes any known prior enforcement cases involving tire stockpiling, and any information available regarding tire stockpiles at licensed or unlicensed salvage yards. While the survey resulted in reports of tire piles throughout the state, there undoubtedly will be "new finds," and additional tire piles at salvage yards, as yet accounted.

ANR field verified 19 of the reported tire piles. Staff ascertained whether the scrap tire piles were improper or problematic; that is, clandestine, obviously abandoned, not associated with a related business, or not being a put to an acceptable use. Staff also measured the dimension of the piles and, using accepted methodologies, calculated quantities of tires for comparison to the quantities estimated by the survey participants. If a tire pile was field-quantified, that calculated amount of tires was utilized in subsequent cleanup cost estimates. Field verification indicated that, generally, the number of tires calculated from the size of the pile was generally within the range of number of tires estimated by a survey respondent. However, not field verifying every reported pile adds a degree of uncertainty to the total quantity estimate.

An example of a field verification form is included as Appendix A

V. Summary of Results

The edited tabularized results of the inventory are included as Appendix B. A total of 62 scrap tire piles are included in the inventory reported by citizens, municipal officials, and various ANR programs. Unless field verified by ANR staff, the size of the individual tire pile was represented by a range: an estimate of the quantity provided by the person who reported the pile.

The number of piles inventoried, and the estimated number of tires in each are as follows:

Range of Tires in Pile	**# of Tire Piles**
Quantity not reported or verified	5
100-200	19
201-1000	22
1001-10,000	10
10,000+	6

Because survey respondents were requested to estimate, with a range, the number of tires in the problem tire pile that they were reporting, the estimated *cumulative* number of problem tires must also be a range. Utilizing the lowest number of each range of the unverified piles, in addition to the field verified quantities, yields a cumulative estimated number of problem tires of **417,000**. Utilizing the highest number of each range of the unverified piles, in addition to the field verified quantities, yields a cumulative estimated number of problem tires of **458,000**.

VI. Cost Estimates for the Proper Management of Problem Tires

A number of variables affect the costs of abating tire piles, including:

- *Size of the pile.* Economy of scale is very evident with tire pile clean-ups. The larger the pile, the less per tire the clean-up cost is. For efficiency, proximal piles of less than 200 tires should be aggregated.
- *Access to the pile*. Older, remote piles may be in wooded inaccessible areas, accumulated at the base of an embankment, been overgrown with trees, or other situations that would necessitate additional equipment and expense.
- *Uniformity of the tire pile*. Tires mixed with other wastes slow down the process, which, in turn, increases costs.
- *"Cleanliness" of the tires.* Often tires or buried, or partially buried, and filled with soil. These tires must be cleansed before processing; an additional step and an additional cost.
- *Rims or Rimless.* Tires on rims are valued for the steel, and decrease the cost of abating the tire pile.
- *Size of the tires.* Large truck and off-road tires are very difficult to manage and process and can increase the cost of the abatement significantly.
- *Current market conditions.* As explained in the Background section, the national and international scrap tire market is fluctuant, and that volatility affects the cost of tire pile abatement projects in Vermont.

Each of the more than 60 piles inventoried has its unique characteristics, so that a uniform per tire or per ton cost estimate will not be accurate for all sites. Based on prior Vermont abatement projects, and conversations with licensed tire collectors and other States' agencies, the range of cost would be $80 - $200/per ton, not including ANR administrative costs. The low per ton cost would reflect a large, orderly, clean, accessible pile that could be loaded using only the typical truck-mounted grapple. The high per ton cost would reflect, a smaller, difficult to access, mixed waste, partially buried, or "dirty" tire pile; a pile that would require additional equipment (bulldozers, front end loaders, excavators) and/or additional labor in order to process the pile.

Therefore, utilizing the estimated range of the quantity of tires, 417,000 – 458,000, and the estimated price range, $80.00 - $200.00 per ton, the cost of collecting and responsibly managing the inventoried problem tires, excluding administering the program, would be:

417,000 tires ÷ 100 tires/ton x $80/ton = $**333,600**
to
458,000 tires ÷ 100 tires/ton x $200/ton = $**916,000**

The ANR (or other State agency) would incur costs for oversight of the cleanup program, including contract administration, field presence, landowner contacts and cost reimbursements, and fund disbursements. ANR project administration is estimated to increase tire pile clean-up costs 15%, or an additional $50,000 to $137,400, **resulting in total clean-up program costs of $383,600 to $1,053,400.**

Scrap tire cleanup contractors are available and, externalities notwithstanding, could abate this number of tires in less than one year. However, property access issues, enforcement actions, and attempting to seek repayment for any State disbursements could significantly lengthen this timeframe.

VII. Conclusion and Recommendations

The Agency of Natural Resources' inventory of problem scrap tire piles revealed few surprises. Previously unknown, smallish piles, of less than 10,000 tires, are located throughout the state. All reported piles greater than 10,000 tires – and a number of smaller piles – were previously identified by the ANR, and several are the subject of enforcement actions, or are in the process of being abated. Other reported problem tire piles are tires that are being used as silage cover anchors or fencing, both legitimate uses for scrap tire. While there are certainly other undiscovered problem tire piles, in all likelihood, Vermont does not possess the illegal tire piles with hundreds of thousands, or millions, of tires that have plagued many other states.

Scrap tire piles are unsightly, are a breeding place for mosquitos, and are a fire hazard; however, arguably, they remain a less environmentally threatening subset of the larger problem of illegal dumping in Vermont. The problem tire piles identified in this inventory, and any detected in the future, should be abated. As required by 10 V.S.A. 6618(b)(10), person who disposed of the tires must be given notice and an opportunity to perform the abatement. Any funds disbursed from the Solid Waste Management Assistance Fund for tire pile clean-ups should be expended judiciously, and all practicable efforts should be made seek repayment of expenses, including placing a lien against the property.

Appendix A

ANR TIRE PILE INVENTORY – FIELD VERIFICATION

Staffperson(s) _____ Date/Time: _____

<table>
<tr><td colspan="2">TOWN:

STREET ADDRESS:

SPAN # (From Enforcement Database):</td></tr>
<tr><td>LANDOWNER (with contact info, if known):</td><td>LOCATED AT (vacant land, farm, tire dealer, etc.):</td></tr>
<tr><td>REPORTED ON SURVEY? (Y / N)</td><td>TIRES BEING ADDED? (Y / N / Don’t Know)</td></tr>
<tr><td colspan="2">Detailed description of location:</td></tr>
<tr><td colspan="2">Estimated quantity of tires, measured how? (Calculations may be shown on back.)</td></tr>
<tr><td colspan="2">Other pertinent information (Persons spoken to, other environmental violations, access control, proximity to neighboring dwellings, site characteristics, visibility from public highways, etc.)</td></tr>
</table>

Site sketch and tire quantity calculations, as needed.

Appendix B – Summary Table of Tire Piles

City/Town:	Street Address of Tire Pile	Reported By	Age of Pile	Estimated # of Tires	Field Verified # of Tires	Located At	Tires Being Added?
Albany	Shuteville road	Citizen	10+ years	(201-1000)*	5700	Other	Unknown
Barre Town	VT 14, 2 miles N of Hope Cem	Citizen	Unknown	100-200		Other	Unknown
Barton	Center Road	Citizen	Unknown	100-200		Other	Unknown
Berlin	Barre Montpelier Rd		Unknown		20,000	Tire Dealer	
Berlin	Lovers Lane	Citizen	Unknown	100-200		Other	Unknown
Bolton/Waterbury	Route 2	Citizen	Unknown	201-1000		Salvage Yard	Unknown
Braintree	Bent Hill Rd	ANR	Unknown			Salvage Yard	
Braintree	Bent Hill Rd	ANR	Unknown			Business	
Brattleboro	Linden Street (VT 30)	Citizen	Unknown	100-200		Farm	Unknown
Bristol	Estey Road	Municipal Official			7000	Other	No
Bristol	Lower Notch Rd	ANR	Unknown		32,560	Salvage Yard	Unknown
Brookline	Hill Rd	Citizen	10+ years	201-1000		Salvage Yard	No
Charlotte	Hinesburg Rd	ANR	Unknown		12,330	Salvage Yard	No
East Thetford	Stevens Rd	Citizen	10+ years	100-201		Other	Yes
East Granville		Citizen	Unknown	201-1000		Other	
East Montpelier	Snow Hill Road	Citizen	Unknown	100-200		Farm	Unknown
East Topsham	Harts Road	Citzen	Unknown	201-1000		Other	Unknown
Ferrisburgh	US 7 East	Citizen	Unknown		300	Tire Dealer	No
Ferrisburgh	US 7 West	ANR	Unknown		32,200	Other	Yes
Granville	VT 100	Municipal Official	Unknown	(201-1000)*	350	Tire Dealer	Yes
Granville	Connecticut Trail	Municipal Official	Unknown	201-1000		Other	Unknown
Guilford	Broad Brook Road	Citizen	Unknown	100-200		Other	Unknown
Hardwick	Mackville Rd	Citizen	10+ years	(1001-10,000)*	1000	Farm	Unknown
Hardwick	Craftsbury Road	ANR	Unknown	(1001=10,000)*	159,540	Other	Unknown

City/Town:	Street Address of Tire Pile	Reported By	Age of Pile	Estimated # of Tires	Field Verified # of Tires	Located At	Tires Being Added?
Hartland	US 5	Citizen	1-5 years	100-200		Other	Yes
Highgate center	Lamkin Street	Citizen	10+ years	100-200		Other	Unknown
Huntington	Bert White Rd	ANR	Unknown			Other	Unknown
Hyde Park	Zack Woods Pond Rd	Citizen	1-5 years	100-200		Other	Unknown
Lincoln	Sugarbush Hill Rd	Municipal Official	Unknown			Salvage Yard	Unknown
Ludlow	Brooks Rd	Municipal Official	Unknown	100-200		Other	Unknown
Middlebury	US 7	Municipal Official	Unknown	(201-1000)*	800	Farm	Unknown
Middlebury	Wilson Rd	Municipal Official	Unknown	(201-1000)*	100	Tire Dealer	Unknown
Middletown Springs	Burdock Ave	Citizen	Unknown	100-200		Salvage Yard	No
Milton, VT	Shirley Avenue	ANR	10+ years		115,000	Salvage Yard	Unknown
Montpelier	College Street	Citizen	1-5 years	100-200		Other	Unknown
Morrisville	Pleasant Street	Citizen	Unknown		1400	Tire Dealer	Yes
N Wolcott	Baldwin Brook Road	ANR	Unknown		6660	Salvage Yard	Unknown
Newport Center	Niles Road	Citizen	10+ years		200	Farm	No
Newport Center	VT 100	Citizen	10+ years		400	Farm	No
North Troy	Pine St	Citizen	Unknown	100-200		Other	Unknown
Orwell	Griswold Lane	Municipal Official	10+ years	1001-10,000		Farm	Unknown
Plainfield	Brook Rd/ Fowler Rd	Municipal Official	10+ years	100-200		Other	Yes
Plainfield	Brook Road	Municipal Official	10+ years		4000	Other	Unknown
Putney	Old Route 5 South	Citizen	10+ years	201-1000		Other	Unknown
Putney	Old Route 5 South	Citizen	Unknown	201-1000		Other	Unknown
Putney	Old Rte 5 South	Citizen	10+ years	201-1000		Other	Yes
Randolph	Meadow Lane	Citizen	10+ years	201-1000		Other	No
Randolph	Spooner Rd	Citizen	10+ years	100-200		Farm	Unknown
Sheldon	Sweet Hollow Rd	Citizen	10+ years	1001-10,000		Other	Yes
St Johnsbury	Ely and State streets	Citizen	10+ years	100-200		Salvage Yard	No

City/Town:	Street Address of Tire Pile	Reported By	Age of Pile	Estimated # of Tires	Field Verified # of Tires	Located At	Tires Being Added?
St Johnsbury Center	Breezy Hill Rd	Citizen	10+ years	(1001-10,000)*	0	Other	No
Sutton	US 5	Citizen	6-10 years	(1001-10,000)*	9200	Other	Unknown
Topsham	Harts Rd	Citizen	10+ years	201-1000		Other	Unknown
Vernon	Fort Bridgeman Rd	Citizen	Unknown	100-200		Other	Yes
Wardsboro	VT 100	Citizen	6-10 years	201-1000		Other	Unknown
Waterbury	US 2	Municipal Official	1-5 years	1001-10,000		Salvage Yard	Unknown
Waterford	Old County Rd	Municipal Official	10+ years	201-1000		Other	Unknown
Weathersfield	US 5 South	ANR	10+ years	201-1000		Salvage Yard	Unknown
Northfield	Lover's Lane	Citizen	10+ years	201-1000		Other	Unknown
Westmore	US 5	Municipal Official	1-5 years	201-1000		Other	Unknown
Whiting	West Rd	Citizen				Tire Dealer	
Woodstock	12 North	Citizen	10+ years	201-1000		Farm	Unknown
				*= Invalidated from field verification			
				Low: 8019	408740		
				High: 49,600			
				Grand Total (Range):	**416,759 to 458,340 tires**		