CY2019

Waste Tire Program Annual Report to the General Assembly

Pour in Place Playground Surface,
Pinnacle Park, City of Garrison, Lewis County
Photo by Lisa Evans

KENTUCKY ENERGY & ENVIRONMENT CABINET

Commonwealth of Kentucky
Energy and Environment Cabinet
Department for Environmental Protection
Division of Waste Management
eec.ky.gov/environmental-protection/waste

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ENERGY AND ENVIRONMENT CABINET MANDATE

This report has been prepared as required by KRS 224.50-872. The purpose of this report is to provide information relevant to the commonwealth's waste tire program. Specifically, it includes information pertinent to expenditures and revenues, effectiveness in developing markets, benefits of the fee in funding the Energy and Environment Cabinet's (EEC) implementation of the waste tire program, and recommendations for program improvements.

> *KRS 224.50-872 states, "The cabinet shall report to the General Assembly no later than January 15 each year on the effectiveness of the waste tire program in developing markets for waste tires, the amount of revenue generated and the effectiveness of the fee established in KRS 224.50-868 in funding the cabinet's implementation of the waste tire program, to include any waste tire amnesty program established by the cabinet as provided for in KRS 224.50-880(1)(b), whether the fee should be extended, comparative data on the number of waste tires generated each year, the number disposed of, the number of orphan tire piles, and the cost of tire disposal by counties in the Commonwealth."*

HISTORY & PURPOSE OF THE FUND

In 1990, the Kentucky General Assembly passed House Bill 32 creating the waste tire control program and establishing the Waste Tire Trust Fund (WTTF) to eliminate existing, and prevent future waste tire piles. The original program imposed a $1.00 fee on retailers of new motor vehicle tires sold in Kentucky, created requirements for tire accumulation and storage, and resulted in the removal of many tires from the environment. However, hundreds of thousands of tires continued to be stockpiled in anticipation that future waste tire markets would develop. In 1994, the General Assembly extended the program an additional four years, adding a prohibition on open burning of waste tires.

In 1998, the General Assembly repealed the waste tire control program and created a program with a renewed approach. The revised statute retained the $1.00 fee collected on new motor vehicle tires, the WTTF, and registration requirements for accumulators of waste tires. New additions to the waste tire management program included financial assurance requirements for accumulators, processors, and transporters of waste tires, grants for projects that manage waste tires, and reporting requirements for the EEC regarding the effectiveness of the program. This fee, collected from consumers by retailers, is paid monthly to the Department of Revenue (DOR). The EEC uses the fee to implement the waste tire program, which includes waste tire collection events (WTCE), cleanups, and grant funding to manage and develop markets for waste tires. The program has been extended during each General Assembly regular session since 2002, including the most recent session in 2018. It is set to expire on June 30, 2020. The tire fee was increased from $1.00

to $2.00 during the 2018 Regular Session of the Kentucky General Assembly, but the additional funding is not expected to be allocated to waste tire programs.

In 2011, House Bill 433 established the Waste Tire Working Group (WTWG), a Division of Waste Management (DWM) committee. This committee is tasked to discuss and research topics in waste tire management, and to make recommendations to the EEC in efforts to improve Kentucky's programs. The committee is charged to convene twice annually, and its meetings are open to the public. The WTWG consists of two ex-officio members of DWM's Recycling and Local Assistance (RLA) Branch, and six appointed members. The six WTWG committee members are appointed by the governor in accordance with KRS 224.50-855.

Governor Bevin appointed Stephanie Givens, Solid Waste Coordinator, to the WTWG in May 2019. Her term expires August 1, 2020. Edna Berger was previously appointed as the Mayoral representative, but is no longer serving as mayor and is expected to be reappointed as the private industry representative. Current members of the WTWG are:

Director, DWM or Designee:.....Byron J. Bland, RLA (ex-officio)
Manager, RLA Branch or Designee: .....Gary Logsdon, Manager, RLA (ex-officio)
Kentucky Department of Agriculture Representative: .....Harlan Hatter
Kentucky Solid Waste Coordinator Representative: ..... Pending appointment
Kentucky Solid Waste Coordinator Representative: .....Stephanie Givens (Hardin Co.)
Mayor Representative: ..... Pending appointment
County Judge/Executive Representative: .....Shane Gabbard (Jackson Co.)
Private Retail Tire Sales Representative:.....Edna Berger (pending)

The WTWG met on November 4, 2019. This meeting provided updates and new information on the status of WTCEs, rubber-modified asphalt (RMA) and crumb rubber. The meeting also provided the opportunity for an outside speaker to present information to the public about pour-in-place walks and playground surfaces using crumb rubber from waste tires. The next meeting for the WTWG is scheduled for March, 2020.

REVENUE

Precise data on statewide replacement tire sales are not readily available, but by reviewing national sales totals and population statistics, it is estimated that Kentuckians annually purchase approximately 3.66 million new replacement tires[1]. Subtracting an estimated 7 percent of this total for internet sales the commonwealth could collect approximately $3.4 million per year. Over the past three years Kentucky has received an average of $2.94 million per year from the motor vehicle retail tire fee, or approximately 86 percent of the money that could be collected. Figure 1 illustrates tire fee receipts, as well as the other revenue generated from the WTTF for the past five years.

[1] *Tire dealers are anything but average,* Modern Tire Dealer, January 1, 2018, www.moderntiredealer.com/uploads/stats/facts-section-2018-1.pdf

Several explanations exist to explain why all of the fees are not being collected, including:

- *Not all retailers collect and remit the proper amount of tire fees;*
- *Fees are not paid by some trucking companies when large quantities of tires are purchased through fleet sales from wholesale companies;*
- *DOR is paid a flat annual fee of $50,000. Insufficient resources and a lack of incentive to monitor non-paying entities could be reduced by paying DOR a percentage of collections, reflective of several states with similar programs; and*
- *The tire fee may be collected with other taxes and fees. Some fees may be inadvertently misallocated to the wrong fund's ledger. This has occurred in at least one other state, and was detected when their collection mechanism changed.*

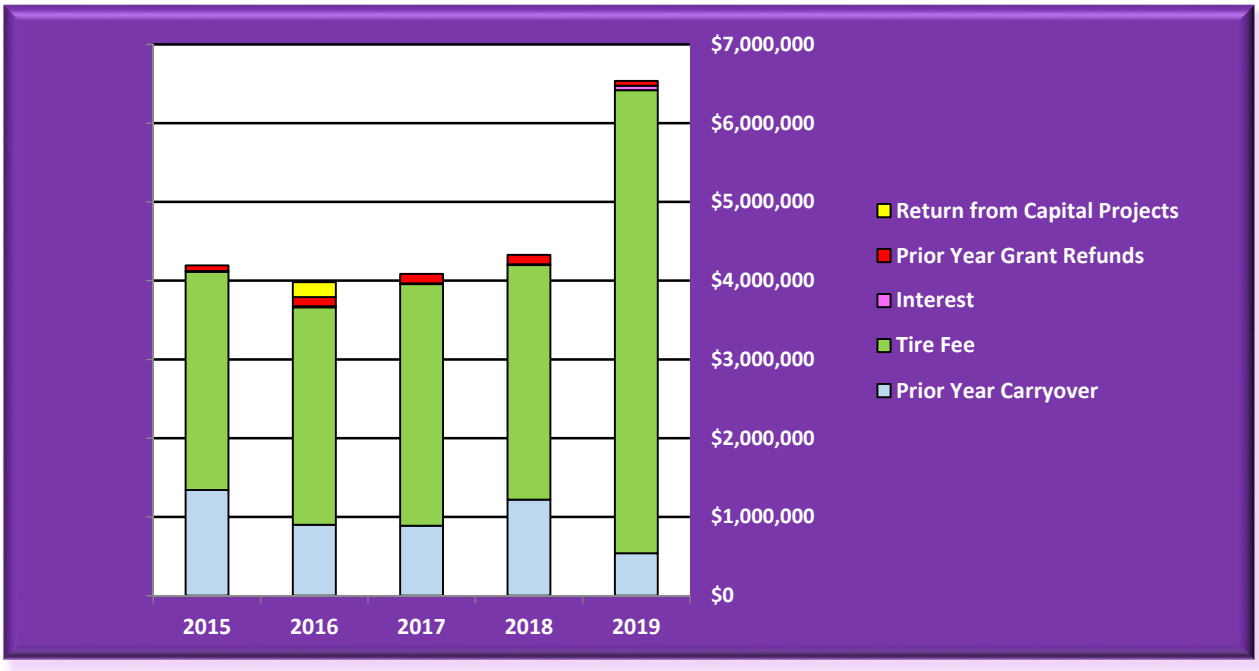

Figure 1: Waste Tire Trust Fund Revenues

EXPENDITURES

A waste tire is most commonly measured in 20-pound units or Passenger Tire Equivalents (PTEs), which is the approximate average weight of a passenger automotive tire. A light truck tire weighs approximately 30 pounds, or 1.5 PTEs, while a medium truck tire, such as a tractor-trailer tire, weighs roughly 110 pounds, and is 5.5 times heavier than an automotive tire, or 5.5 PTEs. Conversion of tire units into a uniform weight basis (100 PTE = 1 ton) allows comparison of waste tire generation to markets that are tracked in tons. This average weight has historically

varied from 17 to 23 pounds based on the sizes of tires used in the operating vehicle inventory. Actual data are limited, therefore 20 pounds is used in this report for mathematical uniformity.

During 2019, the EEC expended waste tire funds to conduct WTCEs, providing monies directly to counties for the removal of waste tires, and for remediation of tire dump sites. Collection events held by the EEC recycled 555,072 PTEs, costing $950,531. Grants distributed by the EEC to Kentucky counties financed $457,010 for disposal and recycled 266,912 PTEs. In addition, the EEC spent $7,603 to clean up 3,049 PTEs collected from a tire dump site. Collectively, state and county government efforts performed the cleanup of 825,033 PTEs during 2019. Kentuckians generated 5.4 million PTEs of waste tires in calendar year 2019, thus the state and counties handled 15.2 percent of the PTEs sent to market. The private sector handled the remaining 84.8 percent of waste tires. Figure 2 provides a five-year synopsis of expenditures for the WTTF.

A potentially substantial cost for the EEC is the cleanup of facilities after tire fires occur at sites where responsible parties are unable to remediate these sites. Tire burning results in releases of hazardous substances into the environment. Cleanup of a post-fire site is a significantly greater cost than removing the same volume of tires at a typical dump site. Regular compliance inspections of permitted waste tire accumulators can minimize the risk of tire fires.

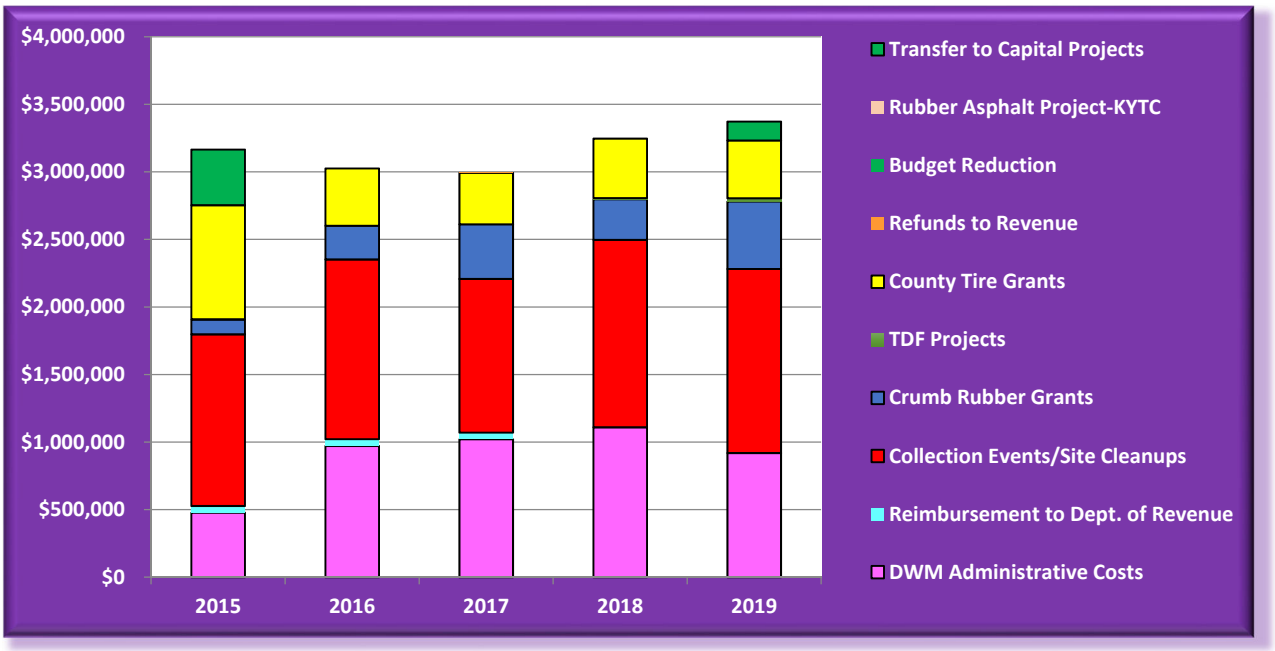

Figure 2: Waste Tire Trust Fund Expenditures

COUNTY GRANTS

WTTF receipts are used by the EEC to fund several programs, assisting in the management of waste tires. These programs include WTCEs, direct grants to counties, crumb rubber/tire-derived products (CR/TDP) grants, rubber-modified asphalt (RMA) grants, and tire dump site cleanups.

The WTCE program, formerly referred to as "tire amnesty," was established in 1998 as part of the EEC's continuing effort to clear waste tires from Kentucky's landscape. WTCEs are conducted in rotating, three-year cycles for each of Kentucky's 120 counties. Each county provides a suitable location and assists with logistics for a three day waste tire drop-off event, open to private citizens or businesses with the exception of tire dealers or automotive scrap yards. The EEC contracts for removal and delivery of recovered tires to a processor where they are recycled into products (usually tire-derived fuel or crumb rubber).

Counties are also provided an annual Direct Grant to manage waste tires. This grant pays for transportation and recycling or disposal. The EEC increased the annual direct tire grant amount to counties from $3,000 to $4,000 in 2015. See Appendix A for details on the most recent cycle of Direct Tire Grants.

Photo 1: Crumb rubber pour-in-place playground, James D. Beville Park Leitchfield
Photo by Lisa Evans

The CR/TDP Grant funds the purchases of tire-derived materials or products for landscaping projects, pour-in-place playgrounds, walking trails, horse trailer or stall mats, tree wells, and other

products utilizing recycled Kentucky tires. See Appendix B for details on the most recent cycle of CR/TDP Grants.

RMA Grants pay for the application of RMA, requiring counties to fund the installation of an equivalent area of standard asphalt on a similar road. The performances of the standard and RMA paving are monitored and compared over a five-year period. The purpose of this grant is to encourage recycling of Kentucky tires, demonstrate the benefits of RMA, collect performance data for the different types of asphalt, and create opportunities for county governments and paving contractors to gain experience working with RMA.

In addition to the structured grants and programs above, the EEC also funds the cleanup of illegal tire dump sites in specific cases where a responsible party is either unknown or incapable of paying for cleanup.

WASTE TIRE MANAGEMENT PROGRAM

Since 1998, the RLA waste tire program has funded the removal and disposal of approximately 27.7 million PTEs at a cumulative cost of $30.6 million. These tires have been collected from all 120 Kentucky counties.

Photo 2: Crumb rubber pour-in-place walking trail, Green County
Photo by Lisa Evans

During the spring of 2019, the EEC conducted WTCEs in the Lincoln Trail and Lake Cumberland Area Development Districts (ADD). These events garnered 441,547 PTEs at a cost of $771,162. During the fall of 2019, the EEC directed collection events in the FIVCO and Buffalo Trace ADDs netting 113,525 PTEs at a cost of $179,370 for a yearly total of 555,072 PTEs at an overall cost of $950,532. WTCEs scheduled for 2020 include Gateway, Big Sandy, Kentucky River, Cumberland Valley, Northern Kentucky, KIPDA, and Purchase ADDs. WCTE historic charts for each ADD from the inception of the program to most recent events are included in Appendix D. All charts report a high collection total in the initial collection year. As time has progressed, the totals have significantly decreased.

The EEC awarded $412,000 to 103 counties in 2019 Direct Tire Grants. The counties spent $355,397 to dispose of or recycle 266,912 PTEs. In addition, counties spent $101,613 of their own money toward waste tire remediation. Counties returned $56,602.58 of unspent state grant funds. This totals $457,010 of both state and county funding for an average cost of $1.71 per PTE.

MARKET DEVELOPMENT

The WTTF helps support the continued removal of waste tires from the environment to prevent fires and reduce breeding grounds for mosquitoes. The EEC has removed waste tires from the environment, funded CR/TDP grant projects, and assisted in developing markets for waste tires. The U.S. Tire Manufacturers Association has placed emphasis on the importance of waste tire cleanups in relation to threats borne by mosquitoes carrying the Zika virus. Waste tires are a haven due to their ability to retain heat, collect water, and offer protection from predators.[2]

The statewide recycling rate for tires was 76.6 percent for 2019 compared to 82.7 percent for 2018. This figure is slightly below the 81.4 percent national average in the U.S. for 2017[3], the latest available national data. However, national recycling rates are declining and Kentucky's 2019 rate is comparable to initial 2019 national projections. The commonwealth increased its recycling rate initially by working to increase the in-state tire derived fuel (TDF) market, but this market is being negatively impacted in Kentucky, and nationally, by decreased solid fuel usage in general, increased competition from low cost natural gas, international manufacturing competition, and environmental regulations unfavorable to coal and other solid fuels like TDF. The cabinet has expanded and broadened its market development efforts, using grants to encourage the initial use of ground rubber in several major applications. It is appropriate for the cabinet to consider additional efforts to increase the reuse percentage in the future through the diversification of markets. TDF is expected to remain one of the largest end-uses of waste tires for the foreseeable future. Ground tire rubber is considered a higher-end market than TDF,

[2] *Recycling Today*, October 3, 2016, Recycling Today Staff, www.recyclingtoday.com/article/rubber-manufacturers-tire-piles-declined/
[3] 2017 US Scrap Tire Management Summary, U.S. Tire Manufacturers Association, July 18, 2018

because properties of the original tire are carried forward to the new product rather than use of a one-time energy value of the waste tire as TDF. Additional market development efforts for civil engineering application of tire-derived aggregate (TDA) in highway, landfill, foundation backfill, and similar projects could enhance market diversification, offsetting the potential for additional future declines in TDF markets.

TDF applications include use in boilers at paper mills, cement kilns, and utilities that use whole or processed tires as a supplemental energy resource, displacing a small percentage of coal usage. These facilities are required to operate in full compliance with all applicable federal, state, and local environmental regulations. The largest ground rubber applications include playground safety cushioning, colored landscape mulch, and athletic fields.

The EEC has conducted the following to gather information about the commonwealth's waste tire recycling markets, generation, and other data required for this report:

- Obtaining recycling market information from each major in-state processor;
- Compiling total tonnage of disposal of waste tires and processing wastes from each landfill;
- Separating tires collected in Kentucky from those collected out-of-state based on processor records and knowledge;
- Identifying and contacting out-of-state processors believed to collect tires from Kentucky and/or supplying TDF to end users in Kentucky; and
- Contacting users of the tire products to verify receipt of processed tires and landfill owners to verify disposal amounts.

Based on this analysis, a brief summary of Kentucky's major markets in 2019 compared to 2018 national markets shows:

- TDF is one of the largest Kentucky markets at 29.4 percent, slightly below the national average of 43 percent in 2017.[4] Total TDF usage in Kentucky declined in 2019 but remained strong compared to many other regions of the country. Decreased usage by East Kentucky Power Cooperative (EKPC) was attributed to operating and economic challenges in 2019, but is expected to rebound in 2020. The Owensboro Municipal Utility (OMU) power boiler and New Page paper mill historically used TDF but both have been closed permanently due to competitive and economic factors. Cemex has continued to use TDF steadily. Large TDF users typically utilize both in- and out-of-state waste tires, so large swings in volume are not always reflected in the calculation of TDF as a percentage of the market for Kentucky generated tires;
- Kentucky's ground rubber applications became Kentucky's second largest market in 2019 at 31.9 percent, significantly above the national average of 25 percent, for a range of

[4] U.S. Tire Manufacturers Association, 2017

applications including landscape mulch, playground cushioning, synthetic turf infill, and ground rubber;

- Kentucky's civil engineering applications used less than one percent compared to the national average of eight percent. This market segment offers substantial opportunity for growth, but will require technical and educational efforts;
- Limited but stable volume in reselling used tires;
- Limited exporting to other countries; and
- Landfill disposal of tires generated in Kentucky increased from 18.2 percent in 2018 to 23.4 percent in 2019 due to lower cumulative markets.

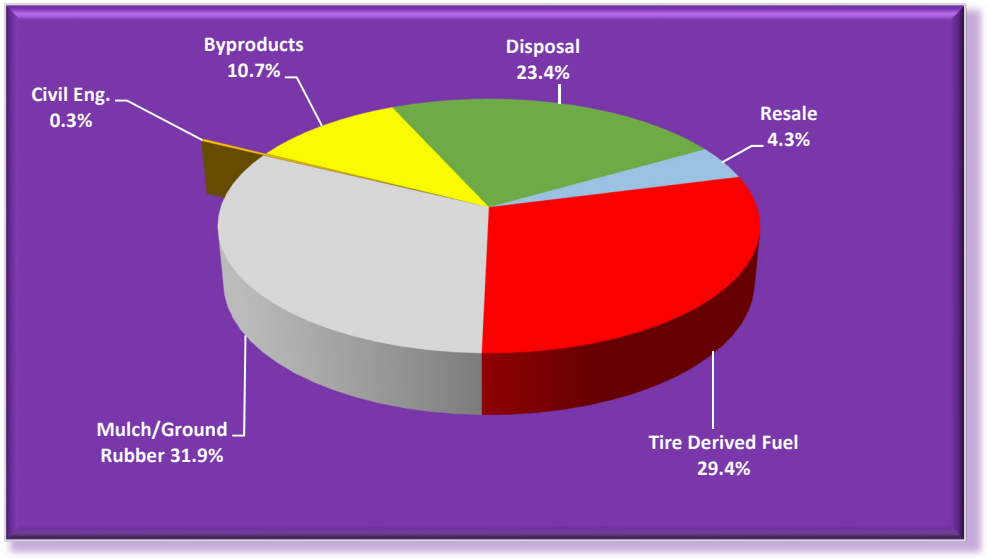

Figure 3: 2019 Kentucky Waste Tire Markets

Kentucky has transitioned from no in-state markets in 2000 to a point where potentially all TDF produced in Kentucky could be consumed in constructive applications. The EEC is involved in several initiatives to encourage TDF market growth, providing both grant funding and technical assistance. There are several success stories in this field, a few mentioned below:

- In 2001, Kentucky spent $454,276 on capital equipment to assist OMU in using TDF. Although their contractual obligation expired in 2004, OMU continued to use TDF. Its consumption since 2016 has been limited by power generation equipment outages, as well as economic and other operational factors. Their boiler using TDF was permanently shut down in 2019 due to a major scheduled maintenance expense and poor economics, but the cumulative consumption of TDF to date has greatly exceeded the contractual obligation. In 2001, TDF production in Kentucky was an estimated 1.1 million tires, all shipped out of state because there were no in-state users. In 2019, TDF users in Kentucky consumed about 3.0 million PTEs, over 1.8 million of which were produced from tires generated in Kentucky.

Some TDF still crosses into and out of Kentucky based on regional markets and transportation logistics.

- Kosmos Cement, a partnership between Cemex and Lone Star Cement, began using whole tires as TDF in 2010, and has added the use of tire chip TDF to become one of the two largest in-state users. The company uses a unique tire machine, similar to a baseball pitching machine, to toss whole tires into the center of the kiln for a more efficient burning. The reinforcing wire in the tire is incorporated into the clinker. Compliance air emission testing revealed no significant change in emissions from using waste tires and coal as opposed to only coal. In fact, nitrogen oxide emissions, a major greenhouse gas (GHG), were reduced by 37 percent when using TDF with coal.[5] By increasing the use of tire chips, in addition to whole tires, Kosmos may further increase its capacity for recovering the energy from tires, so additional growth is possible, but is dependent on competitive economics. An automated whole tire feeding system could improve economics and allow increased whole tire usage.
- Another progressive company using TDF is EKPC. The EEC submitted a letter in support of EKPC's petition to the Public Service Commission (PSC) during 2012 to use the Fuel Adjustment Clause for TDF, which was granted in 2013. Use of the provision allows for quicker recovery of TDF cost from the electrical customer and makes the use of alternative fuels more economical. EKPC has become one of the largest TDF users, potentially using up to 5 million PTEs per year to provide two to four percent of its energy requirements. The operating rates for this efficient, environmentally sound fluidized bed boiler can be impacted by low-cost natural gas boilers. EKPC has made changes to allow additional TDF usage depending on availability of the high quality TDF required in the facility.

The use of TDF helps further the use of coal as it makes the fossil fuel more environmentally friendly. According to the United States Environmental Protection Agency (EPA), GHG emissions can be reduced as a co-benefit of the use of secondary materials. Specifically, TDF combustion results in slightly lower GHG emissions per British Thermal Unit (BTU) than coal, and when considering emissions related to extraction and processing of coal, this difference becomes even more significant. Similarly, TDF combustions generate a slightly lower volume of particulate matter per BTU compared to coal.[6] Therefore, the use of TDF to reduce certain pollutants may make the long-term use of coal more viable.

Substituting TDF for coal would also help avoid an estimated 0.246 lbs/million BTUs of particulate matter associated with the extraction and processing of the coal. Multiplying the 2016 use of 38,340 tons of TDF with coal in Kentucky by these factors shows a savings of nearly 13,000 tons of carbon dioxide and 147 tons of particulate matter not emitted each year. The use of TDF to reduce certain pollutants makes the long-term use of coal more viable.

[5] *Cement Kiln Burns Scrap Tires*, The Courier-Journal, November 26, 2012
[6] 76FR15494, 40 C.F.R. Part 241, EPA, Identification of Non-Hazardous Secondary Materials that Are Solid Waste, Final Rule, March 21, 2011, *Federal Register*

The ground rubber market has remained steady over time. Since 2004, the commonwealth has awarded 613 grants totaling over $8.9 million, primarily to schools and municipalities, for projects using crumb rubber or other tire-derived products. Initially, common uses for this grant funding included crumb rubber spread on athletic fields to increase turf life and on playgrounds to reduce injuries. In October 2014, NBC News presented a story about possible health threats associated with the use of crumb rubber on athletic fields, and later presented a similar story on concerns with the use of crumb rubber mulch on playgrounds. A premise of these studies is that exposure to crumb rubber and playground mulch may result in exposure that could result in adverse health effects. In light of these concerns, and out of an abundance of caution, the EEC has not provided grant funding for loose shredded or crumb rubber on playgrounds and athletic fields as part of its grant portfolio since 2014.

In 2016 the EPA, Centers for Disease Control (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR), and Consumer Product Safety Commission (CPSC) initiated the Federal Research Action Plan (FRAP) on Recycled Tire Crumb Used on Playing Fields and Playgrounds. The study consists of two parts: Part 1 - tire crumb rubber characterization, and Part 2 – exposure characterization study. The two part study is not a complete risk assessment, but the results may inform the risk assessment process. On July 25, 2019, EPA released the Part 1 report with plans to release the Part 2 report at a later date. The results of Part 1 included the following: a range of chemicals were observed for both metals and organics, chemical concentrations were similar to other published studies, and both air emissions of most organic chemicals and bioacessibility of metals were low. Concurrently the DWM is reviewing research reports and field/laboratory studies that are being conducted on an international level similar to the one EPA is coordinating in the United States. CR/TDP grants were still made available to entities for other applications, including landscaping, park/trail benches, picnic tables, and solid poured-in-place surfacing for hiking trails and playgrounds. The suspension of grant funding for loose rubber material playgrounds and athletic fields has significantly affected rubber production for these uses in the state, but there has been an overall increase in shredded and ground tire production.

Photo 3: Breckinridge County waste tire pile before cleanup
Photo by Jenny Carr

Manufacturing of ground rubber and mulch from Kentucky tires increased from an essentially nonexistent product in 1998 to 1.45 million PTEs in 2019. Liberty Tire Recycling, LLC, in Union County, manufactures a large quantity of colored mulch for retail outlets including Lowes, Home Depot, and Wal-Mart. Dalton Tire Recycle, in Boyd County, produces ground rubber for playgrounds and horse arenas. Porter's Tire and Auto Service, in Carter County, initiated crumb rubber and rubber mulch production in 2013.

Photo 4: Breckinridge County after waste tire cleanup event
Photo by Grant White

Ground tire rubber used in RMA is emerging as an important market. The EEC promotes this type of asphalt as an additional option to increase scrap tire recycling and has offered the RMA grant since 2016. This grant is applied as a reimbursement to county or urban-county government recipients for paving a segment of roadway with RMA. The recipients must match the grant by paving an equal portion of the roadway, or a similar roadway, using the same volume of traditional asphalt. The two sections are then assessed over a five year period to determine the performance of RMA compared to standard asphalt.

Since the RMA grants were initiated, the WTTF has funded 22 different road projects reimbursing $1,746,280.36 to counties for RMA paving. In 2019, $501,819.53 was paid to reimburse five grant projects, which expended approximately 2,900 tires. This grant is expected to continue in 2020, and could possibly be expanded to include additional pavement processes, contingent on sufficient funding. Appendix C includes grant recipient information. All RMA projects have passed tests in 2019 to meet existing Kentucky Transportation Cabinet (KYTC) standard specifications. These tests, which compared RMA surfaces to traditionally paved asphalt areas of similar area, included compaction density, asphalt content, voids, and performance grade (resistance to hot and cold weather under load).

Photo 5: Road preparation for RMA paving project, Hatcher Valley Road, Hart County
Photo by Byron J. Bland

Market diversity is a critical component of successful waste tire management programs. Kentucky has developed diverse product markets, producing TDF and ground rubber products, representing approximately 62 percent of Kentucky's waste tire generation. However, developing civil engineering markets for shredded tires could further enhance the diversity of Kentucky's markets, providing constructive applications for shredded tires that are currently landfilled. Additionally, when considering possible new areas for growth in waste tire markets, it should be noted that in 2015, Kentucky ranked third in the U.S. for car and truck production.[7] The commonwealth could consider assisting the three major Kentucky automotive manufacturers in using waste tire ground rubber in molded automotive parts to expand this important potential application.

[7] *Auto Jobs & Economics*, Auto Alliance, www.autoalliance.org/auto-jobs-and-economics/state-facts

Photo 6: RMA paving project, Verna Hills, Clark County
Photo by Byron J. Bland

MARKET DYNAMICS

Due to the volatile nature of the scrap tire market, it is not uncommon for tire processors to quickly accumulate more tires than they can reasonably manage during peak times, processing equipment outages, or changes in product markets. When shredded tires are improperly stored, specifically in large, deep compacted piles, the possibility of auto-ignition exists. When a large pile of whole or shredded tire material ignites, it is extremely difficult to extinguish. Permitted tire processors are required to have a bond equal to $1.00 per on-site PTE, with a minimum of $10,000. A common problem with this system is that facilities often bond for the minimum amount, then accumulate well over 10,000 tires, resulting in circumstances where their bond is inadequate to cover a required cleanup. In addition to stronger enforcement of the bonding requirement, a solution for consideration could be realized by funding remediation of tire fires

to include a statutory increase in the amount of the bond required. The bond amount in KRS 224.50-862 could be increased from $1.00 per tire to $1.50 to cover cleanup costs. Similar to other states, the legislature could consider requiring an actual cost estimate for closure to determine the amount of financial assurance requirement.

A potential problem for tire processors is the maturation of national TDF markets, reflecting a general downturn in U.S. manufacturing, and reduction in coal usage. Unlike many states, Kentucky's TDF market remains fairly robust and has ongoing potential to continue as a major use of waste tires for the commonwealth. However, use of all solid fuels, including coal and TDF, is expected to decline in the foreseeable future. Continuing efforts to further diversify markets are critical to maintaining a high rate of constructive utilizations of waste tire resources.

Photo 7: RMA paving project, Thurman Road, Pulaski County
Photo by Byron J. Bland

FUTURE OF THE FUND

The waste tire program exemplifies the EEC's mission of protecting human health and the environment by encouraging waste reduction, reuse, and recycling. The WTTF supports statewide WTCEs, remediates large tire piles, provides direct grants to counties, and promotes market development for TDF and ground rubber. If the waste tire fee is not extended, program funds will not be available to Kentucky businesses involved in tire processing, and remediation would be negatively affected.

Photo 8: RMA paving project, Thurman Road, Pulaski County
Photo by George Partridge

A total of 37 states have mandated tire fees[8]. These fees are collected in different ways, but most commonly through adding the fee to retail tire sales. Some state fees are as low as $0.25, but most are in the $1 to $2 range.

Over the years there have been several examples of states that discontinued their tire fee programs with negative results. Oregon, Wisconsin, Idaho, Texas, Washington, and Missouri are examples of states that discontinued waste tire fees, and experienced problems such as increased stockpiles, decreased monitoring of processors and haulers, and decline in waste tire recycling markets leading to lower tire recycling rates. Most of these states have since re-instated their tire fee to address these problems.[9]

[8] https://www.ustires.org/system/files/USTMA_scraptire_summ_2017_072018.pdf
[9] *Waste Tire Management Program Closure-Precedents/Experience in Other States*, Terry Gray, TAG Resource Recovery, Inc, Houston, TX 2011

In addition to the repercussions discussed above, the following impacts could happen in Kentucky as a result, if the fee were to expire:

- Counties would not receive the $4,000 annual grant to clean up abandoned waste tires;
- Rural areas would be impacted by abandoned waste tires on farms and roadsides;
- Counties might be unable to rely on the commonwealth for tire pile remediation; and
- Market development would likely cease.

The waste tire program faces many challenges, common to similar programs throughout the country:

- It is probable that some retailers collect disposal fees and stockpile waste tires until a WTCE is conducted in their area, or otherwise mismanage their waste tires.
- Individuals have chosen to retain their waste tires to avoid additional fees charged by tire retailers for waste tire disposal, taking these tires out of the recycling stream. Some of these tires may later be mismanaged, burdening counties with continued waste tire management issues.

It has been reported that some tire retailers charge higher tire disposal/recycling fees to discourage individuals from leaving waste tires with the retailer, compared to the average $1.50 to $2.00 fee. As an alternative, this situation could be improved by requiring the disposal price to be included separately and alongside the sale price and tire fee, or list the actual statewide average disposal rate on a notice and allow the free market to manage the situation.

Many tires collected by registered waste tire transporters are still being legally disposed of in landfills rather than being recycled. It is less capital intensive to cut or shred and landfill a tire, than to install equipment required to produce a recyclable product. Some states have corrected this problem by banning all tire material, including cut or shredded tires, from landfills except for pre-approved construction applications within landfills.

Based on national averages, it is estimated that Kentuckians purchase 530,000 used tires annually.[10] A recent tire industry survey disclosed that 88 percent of all tire repairs are incorrectly performed.[11] In reaction, consideration could be given to whether use or sale of repaired tires should be promoted or discouraged.

Statewide coverage by reputable tire processing facilities is essential for the free market to work. Long transportation distances translate into higher costs that keep tire recycling from being economically feasible.

Aligning the reporting schedule of the WTTF within the state budget cycle of two fiscal years,

[10] *Used Tires Businesses Balloon*, Feb. 2011, Mike Breslin, www.americanrecycler.com/0211/814used.shtml
[11] *RMA: 88% of Tire Repairs Done Incorrectly*, 2008, www.tirebusiness.comm/article/20080228/NEWS/302289997?template=printart

could improve the efficiency of the report. A revision to KRS 224.50-872 from annually to a two-year reporting cycle would become necessary.

KRS 224.50-868(3) authorizes the DOR to collect the waste tire fee. The statute requires up to $50,000 per year be transferred to DOR for collection of this fee. This neither provides enough money (estimated cost of $75,000 to employ one person annually) nor incentive for DOR to enforce the collection. States incorporating a specific percentage to be awarded to the collection agency have higher collection rates than Kentucky.

In conclusion, the Energy and Environment Cabinet strongly recommends that the General Assembly extend the waste tire fee and continue the waste tire program.

CREDITS & ACKNOWLEDGEMENTS

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Deputy Secretary Vacant

Department for Environmental Protection
Commissioner Anthony R. Hatton, P.G.
Deputy Commissioner Sean Alteri

This annual report is intended to provide a concise set of facts and measurements to support environmental decision-making. We welcome your questions and comments to the contacts below:

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We acknowledge the contributions of the management, staff, and consultants of the Division of Waste Management:

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Jenny Carr
John W. Brown
Donna Conway
Donny Atha
Gary Logsdon
George Gilbert
George Partridge
Grant White
Lisa Evans
Terry A. Gray
Ty Collins

Edited by: Program Planning and Administration Branch staff

January 2020

APPENDICES

Appendix A: Fiscal Year 2019 Waste Tire Grants

COUNTY	AWARD	FUNDS USED	FUNDS RETURNED	NUMBER OF PTE's
Adair Co.	$4,000.00	$4,329.17	$0	3,137
Allen Co.	$4,000.00	$4,960.50	$0	3,044
Anderson Co.	$4,000.00	$4,845.55	$0	1,951
Ballard Co.	$4,000.00	$4,703.50	$0	4,090
Barren Co.	NA	N/A	N/A	N/A
Bath Co.	$4,000.00	$6,037.75	$0	4,689
Bell Co.	$4,000.00	$4,419.00	$0	2,143
Boone Co.	$4,000.00	N/A	N/A	N/A
Bourbon Co.	NA	N/A	N/A	N/A
Boyd Co.	$4,000.00	$4,345.50	$0	1,293
Boyle Co.	$4,000.00	$1,668.62	$2,331.38	641
Bracken Co.	$4,000.00	$4,000.51	$0	1,143
Breathitt Co.	$4,000.00	$691.00	$3,309.00	162
Breckinridge Co.	$4,000.00	$4,582.00	$0	1,762
Bullitt Co.	$4,000.00	$1,248.25	$2,751.75	437
Butler Co.	$4,000.00	$4,264.15	$0	1,193
Caldwell Co	$4,000.00	$3,816.00	$184.00	3,900
Calloway Co.	$4,000.00	$3,827.60	$172.40	1,367
Campbell Co.	$4,000.00	$14,572.68	$0	9,038
Carlisle Co.	$4,000.00	N/A	N/A	N/A
Carroll Co.	$4,000.00	$3,788.50	$211.50	2,250
Carter Co.	NA	$3,548.50	$451.50	2,359
Casey Co.	$4,000.00	$4,092.00	$0	1,860
Christian Co.	$4,000.00	$4,647.00	$0	2,798
Clark Co.	$4,000.00	$3,706.00	$294.00	2,491
Clay Co.	$4,000.00	$3,869.80	$130.20	1,759
Clinton Co.	$4,000.00	N/A	N/A	N/A
Crittenden Co.	$4,000.00	$7,000.00	$0	9,800
Cumberland Co.	$4,000.00	$4,500.00	$0	4,500
Daviess Co.	$4,000.00	$4,156.00	$0	4,156
Edmonson Co.	$4,000.00	$4,209.80	$0	1,783
Elliott Co.	$4,000.00	$4,968.50	$0	2,390

COUNTY	AWARD	FUNDS USED	FUNDS RETURNED	NUMBER OF PTE's
Estill Co.	NA	N/A	N/A	N/A
Fayette Co.	$4,000.00	$4,000.00	$0	2,286
Fleming Co.	$4,000.00	$1,722.88	$2,277.12	492
Floyd Co.	$4,000.00	$4,075.00	$0	1,358
Franklin Co.	$4,000.00	$2,150.00	$1,850.00	1,200
Fulton Co.	NA	N/A	N/A	N/A
Gallatin Co.	$4,000.00	$4,523.48	$0	1,366
Garrard-Lincoln	$8,000.00	$4,000.00	$4,000.00	1,120
Grant Co.	$4,000.00	$7,201.00	$0	15,352
Graves Co.	$4,000.00	$7,000.00	$0	7,800
Grayson Co.	$4,000.00	$2,182.25	$1,817.75	1,009
Green Co.	$4,000.00	$2,838.25	$1,161.75	960
Greenup Co.	$4,000.00	$5,848.00	$0	4,508
Hancock Co.	NA	$4,177.40	$0	1,356
Hardin Co.	$4,000.00	$3,713.50	$286.50	1,621
Harlan Co.	$4,000.00	N/A	N/A	N/A
Harrison Co.	$4,000.00	$1,995.50	$2,004.50	677
Hart Co.	$4,000.00	$3,669.00	$331.00	1,093
Henderson Co.	$4,000.00	$3,600.00	$400.00	3,600
Henry Co.	NA	N/A	N/A	N/A
Hickman Co.	$4,000.00	$1,500.00	$2,500.00	1,300
Hopkins Co.	$4,000.00	$5,902.10	$0	6,576
Jackson Co.	$4,000.00	$3,888.94	$111.06	1,607
Louisville-Jefferson Co.	NA	N/A	N/A	N/A
Jessamine Co.	$4,000.00	$5,027.50	$0	3,096
Johnson Co.	NA	N/A	N/A	N/A
Kenton Co.	$4,000.00	$5,115.00	$0	2,600
Knott Co.	NA	$7,925.00	$0	1,800
Knox Co.	$4,000.00	$4,385.00	$0	1,980
LaRue Co.	$4,000.00	$4,000.00	$0	2,400
Laurel Co.	$4,000.00	$5,238.25	$0	1,727
Lawrence Co.	$4,000.00	$3,881.50	$118.50	1,579
Lee Co.	$4,000.00	$3,976.28	$23.72	1,692
Leslie Co.	$4,000.00	$3,994.00	$6.00	535
Letcher Co.	NA	$4,221.60	$0	2,522
Lewis Co.	$4,000.00	$6,177.73	$0	1,765

COUNTY	AWARD	FUNDS USED	FUNDS RETURNED	NUMBER OF PTE's
Livingston Co.	$4,000.00	N/A	N/A	N/A
Logan Co.	$4,000.00	$4,000.00	$0	2,177
Lyon Co.	$4,000.00	$4,353.00	$0	1,844
Madison Co.	$4,000.00	$4,160.45	$0	1,488
Magoffin Co.	$4,000.00	$4,000.00	$0	3,000
Marion Co.	$4,000.00	$2,999.00	$1,001.00	638
Marshall Co.	$4,000.00	$4,000.00	$0	2,869
Martin Co.	NA	$3,300.00	$700.00	1,253
Mason Co.	$4,000.00	$16,475.30	$0	8,442
McCracken Co.	$4,000.00	$4,000.00	$0	7,733
McCreary Co.	$4,000.00	$4,131.00	$0	730
McLean Co.	$4,000.00	$4,000.00	$0	2,600
Meade Co.	$4,000.00	$8,477.00	$0	2,117
Menifee Co.	$4,000.00	$4,337.50	$0	2,298
Mercer Co.	$4,000.00	$2,261.00	$1,739.00	974
Metcalfe Co.	$4,000.00	$987.85	$3,012.15	330
Monroe Co.	$4,000.00	$4,076.30	$0	2,290
Montgomery Co.	$4,000.00	$3,147.00	$853.00	1,049
Morgan Co.	NA	$3,402.00	$598.00	1,424
Muhlenberg Co.	NA	N/A	N/A	N/A
Nelson Co.	$4,000.00	$11,100.00	$0	6,062
Nicholas Co.	NA	N/A	N/A	N/A
Ohio Co.	$4,000.00	$5,536.75	$0	4,086
Oldham Co.	$4,000.00	$2,285.00	$1,715.00	842
Owen Co.	$4,000.00	$2,670.50	$1,329.50	1,162
Owsley Co.	NA	N/A	N/A	N/A
Pendleton Co.	$4,000.00	$2,358.25	$1,641.75	1,717
Perry Co.	NA	$14,145.00	$0	9,430
Pike Co.	$4,000.00	$7,800.00	$0	6,600
Powell Co.	$4,000.00	$4,094.25	$0	1,601
Pulaski Co.	$4,000.00	$6,374.72	$0	2,812
Robertson Co.	NA	N/A	N/A	N/A
Rockcastle Co.	$4,000.00	$4,000.50	$0	1,756
Rowan Co.	$4,000.00	$2,835.75	$1,164.25	735
Russell Co.	$4,000.00	$3,784.22	$215.78	1,570
Scott Co.	$4,000.00	$2,583.38	$1,416.62	650

COUNTY	AWARD	FUNDS USED	FUNDS RETURNED	NUMBER OF PTE's
Shelby Co.	$4,000.00	$4,000.00	$0	3,000
Simpson Co.	$4,000.00	$298.50	$3,701.50	114
Spencer Co.	$4,000.00	$4,000.00	$0	2,800
Taylor Co.	$4,000.00	$14,481.22	$0	4,508
Todd Co.	$4,000.00	$0.00	$4,000.00	0
Trigg Co.	NA	$3,816.00	$184.00	4,500
Trimble Co.	$4,000.00	$4,000.00	$0	933
Union Co.	$4,000.00	$6,000.00	$0	5,000
Warren Co.	$4,000.00	$0.00	$4,000.00	0
Washington Co.	$4,000.00	$5,907.60	$0	1,427
Wayne Co.	$4,000.00	$1,392.60	$2,607.40	633
Webster Co.	$4,000.00	$4,132.31	$0	4,873
Whitley Co.	NA	N/A	N/A	N/A
Wolfe Co.	$4,000.00	$4,001.96	$0	1,702
Woodford Co.	$4,000.00	$4,577.10	$0	2,029
TOTALS	**$400,000.00**	**$457,010.05**	**$56,602.58**	**266,912**

Appendix B:
Calendar Year 2019 Crumb Rubber/Tire-Derived Products Grants

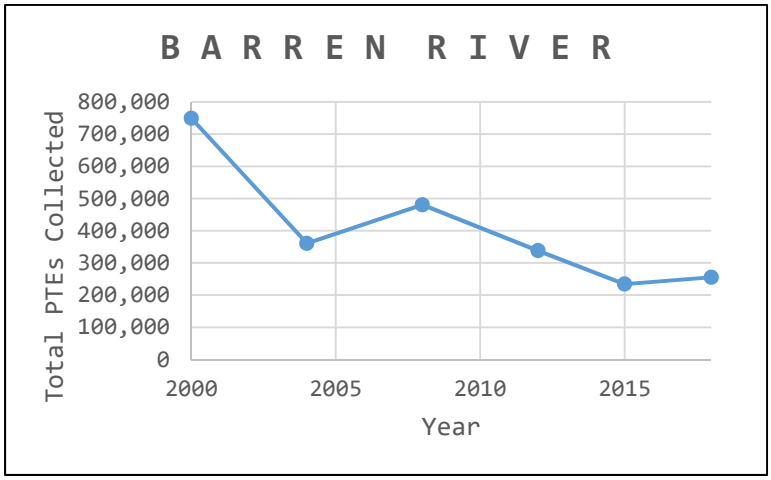
COUNTY	APPLICANT	LOCATION	PROJECT	AWARD
Barren	City of Glasgow	City of Glasgow Parks and Recreation	Park Benches & Picnic Tables at Five City Parks	$10,319
Bell	City of Middlesboro	Fordwoods Park	Poured-In-Place Playground	$63,400
Bell	Main Street Organization	Levitt AMP Middlesboro Venue	Bonded Rubber Surface Walkway	$6,500
Christian	City of Crofton	Gordon Park	Picnic Tables & Park Benches	$21,453
Daviess	Owensboro Public Schools	Foust Elementary School	Poured-In-Place Playground	$12,225
Grayson	City of Leitchfield	James C. Beville City Park	Poured-In-Place Playground	$42,000
Green	Green County Fiscal Court	American Legion Park	Poured-In-Place Walking Track	$78,750
Greenup	City of Russell	City of Russell	Landscaping	$5,280
Greenup	Greenup County Schools	McKell Elementary	Picnic Tables	$4,657
Jefferson	Jefferson County Public Schools	Ramsey Middle School	Park Benches	$2,974
Letcher	Letcher County Fiscal Court	Fishpond Lake	Park & Trail Benches, Picnic Tables, Wheelchair Accessible Picnic Tables	$11,597
Lewis	Lewis County Fiscal Court	Pinnacle Park	Poured-In-Place Playground	$70,200
Marshall	City of Benton	Kindness Park	Park Benches, Picnic Table, Wheelchair Accessible Picnic Table	$2,906
Mason	City of Maysville	U.S. Bank Mall Arena, Stanley Reed Court Street, Market Street	Landscaping	$4,500

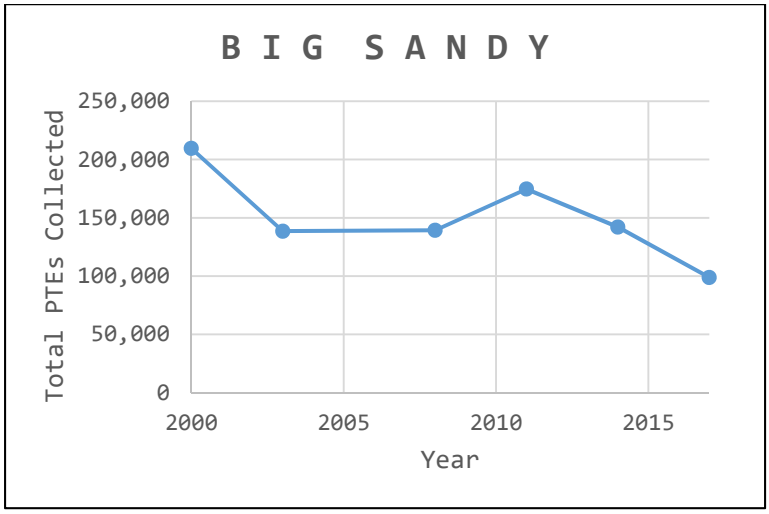
COUNTY	APPLICANT	LOCATION	PROJECT	AWARD
Monroe	Old Mulkey Meeting House State Historic Site	Playground	Park Benches	$1,517
Nelson	City of Bardstown	Bardstown Parks and Recreation Department	Landscaping, Rubberific Timbers, Park Benches, Picnic Tables, Wheelchair Accessible Picnic Table	$18,379
Owen	Owen County Fiscal Court	Owen County Public Works	Landscaping	$22,018
Pulaski	Pulaski County Fiscal Court	Pulaski County Park	Poured-In-Place Playground	$29,040
Robertson	Robertson County Schools	Robertson County Schools	Rubber Playground Mats	$1,258
Scott	City of Georgetown	Kendyl and Friends Playground – Georgetown Campus	Poured-In-Place Playground	$61,920
Spencer	Spencer County School District	Taylorsville Elementary School	Park Benches	$2,344
Todd	City of Elkton	Elkton-Todd County Park	Landscaping & Rubberized Timbers	$6,861
Webster	City of Dixon	Baker Park	Poured-In-Place Playground	$20,373
			TOTAL	**$500,471**

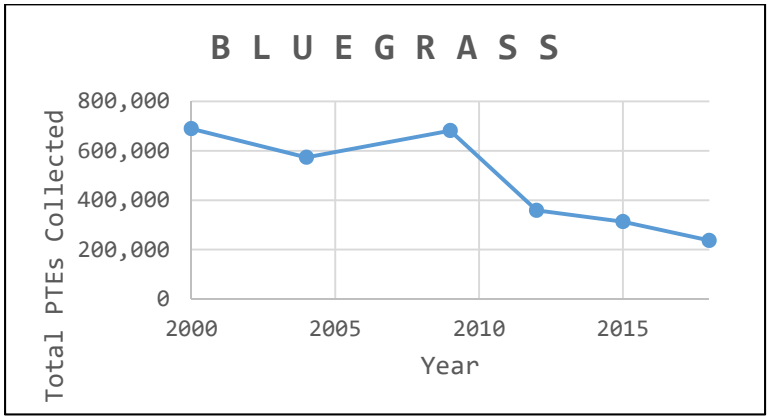
Appendix C:
Calendars Year 2017 to 2019 Rubber-Modified Asphalt Grants

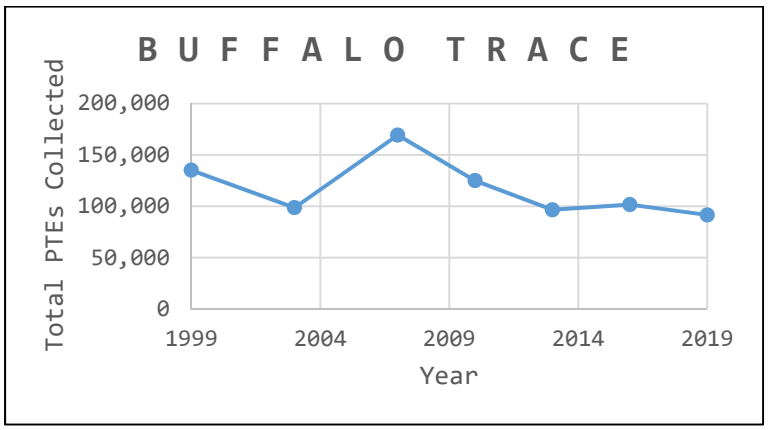
COUNTY	APPLICANT	LOCATION/ROAD	SURFACE TYPE	AWARD
CY2017 Grant Cycle				
Green	Green Co. Fiscal Court	South End Road	Thin Overlay	$84,460.00
Hancock	Hancock Co. Fiscal Court	Vastwood Park	Thin Overlay	$78,100.00
Jefferson	Louisville Metro Government	Lake Forest Parkway	Thin Overlay	$73,400.00
Marion	Marion Co. Fiscal Court	Riley Gravel Switch Road	Thin Overlay	$98,463.00
Webster	Webster Co. Fiscal Court	Sebree Slaughter, Watkins Sebree Roads	Thin Overlay	$99,000.00
CY2018 Grant Cycle				
Adair	Adair Co. Fiscal Court	West Egypt, Snake Creek Roads	Thin Overlay	$83,572.50
Bracken	Bracken Co. Fiscal Court	Dover Road, Fronks Lane	Thin Overlay	$68,998.00
Green	Green Co. Fiscal Court	J. T. Ward Road	Chip Seal	$73,946.00
Hart	Hart Co. Fiscal Court	Hatcher Valley Road	Thin Overlay	$46,391.50
Jefferson	Louisville Metro Government	South 4th Street	Thin Overlay	$88,080.00
Marion	Marion Co. Fiscal Court	Helm School House Road	Chip Seal	$34,500.00
Taylor	Taylor Co. Fiscal Court	Pike's Ridge Road	Thin Overlay	$57,500.00
CY2019 Grant Cycle				
Clark	Clark Co. Fiscal Court	Verna Hills Subdivision	Thin Overlay	$108,900.00
Fayette	LFUCG	Southland Drive	Thin Overlay	$98,851.50
Hardin	Hardin Co. Fiscal Court	Cecilia Smith Road	Thin Overlay	$89,618.03
Hopkins	Hopkins Co. Fiscal Court	Old Morganfield Road	Thin Overlay	$102,960.00
Pulaski	Pulaski Co. Fiscal Court	Thurman Road	Thin Overlay	$101,490.00

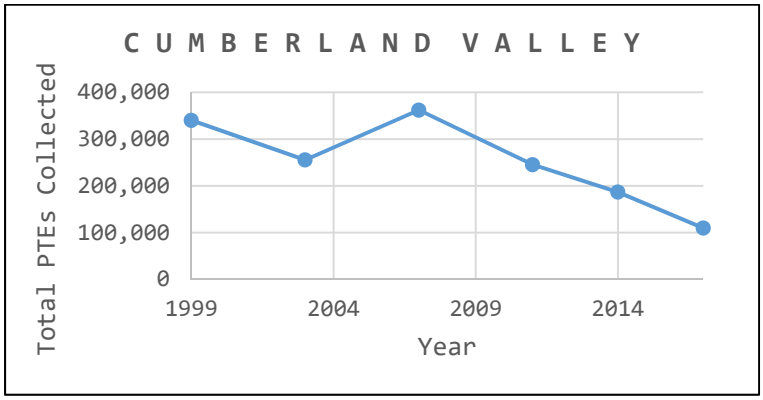
APPENDIX D:
Waste Tire Statistics History by Area Development District








B U F F A L O T R A C E
Total PTEs Collected
200,000
150,000
100,000
50,000
0
1999
2004
2009
2014
2019
Year


C U M B E R L A N D V A L L E Y
Total PTEs Collected
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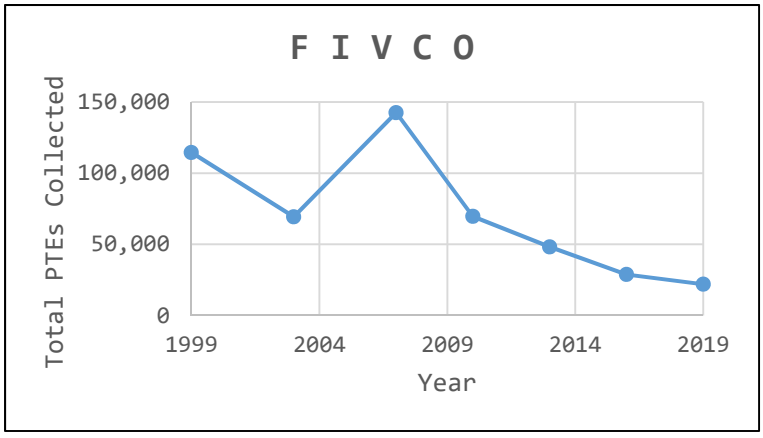
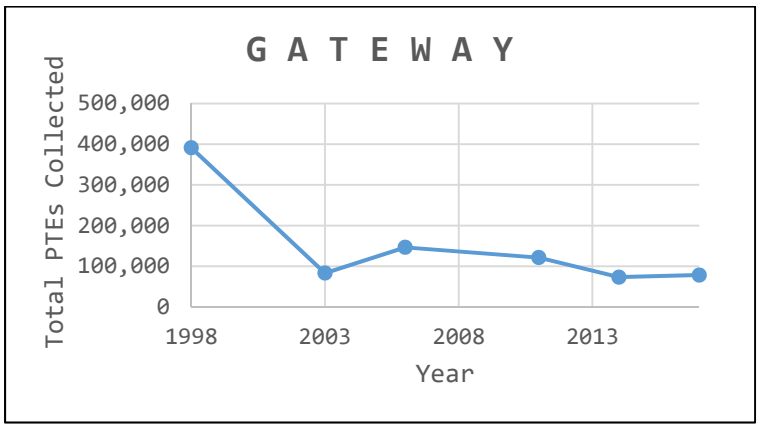
300,000
200,000
100,000
0
1999
2004
2009
2014
Year


F I V C O
Total PTEs Collected
150,000
100,000
50,000
0
1999
2004
2009
2014
2019
Year


G A T E W A Y
Total PTEs Collected
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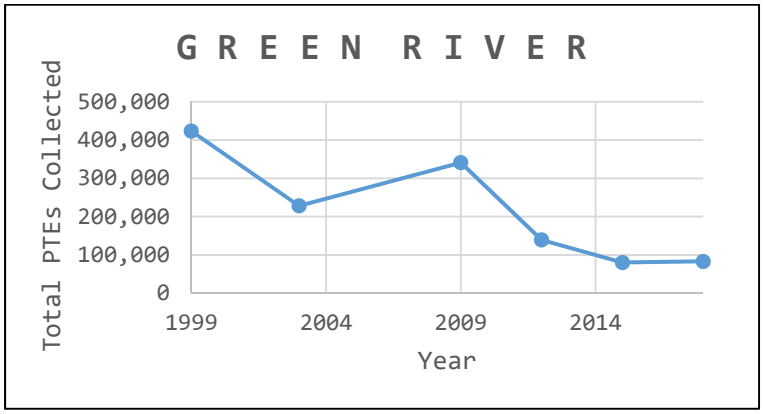
400,000
300,000
200,000
100,000
0
1998
2003
2008
2013
Year


G R E E N R I V E R
Total PTEs Collected
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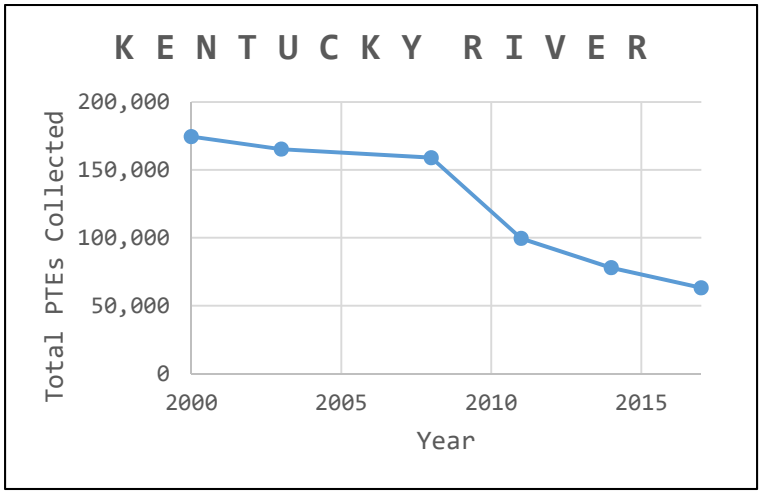
400,000
300,000
200,000
100,000
0
1999
2004
2009
2014
Year


K E N T U C K Y R I V E R
Total PTEs Collected
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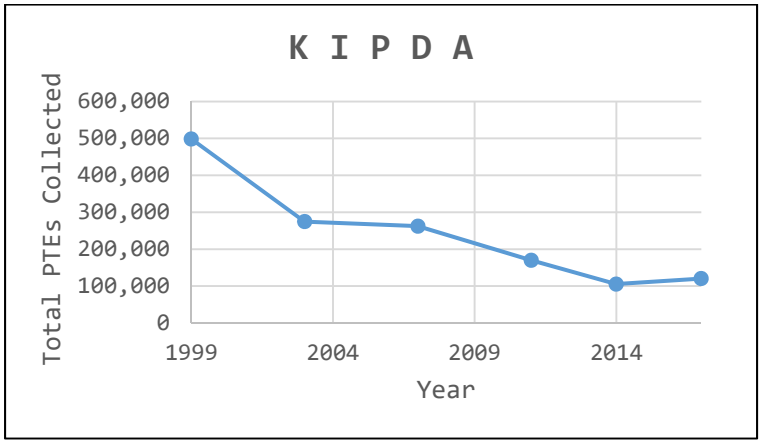
150,000
100,000
50,000
0
2000
2005
2010
2015
Year


K I P D A
Total PTEs Collected
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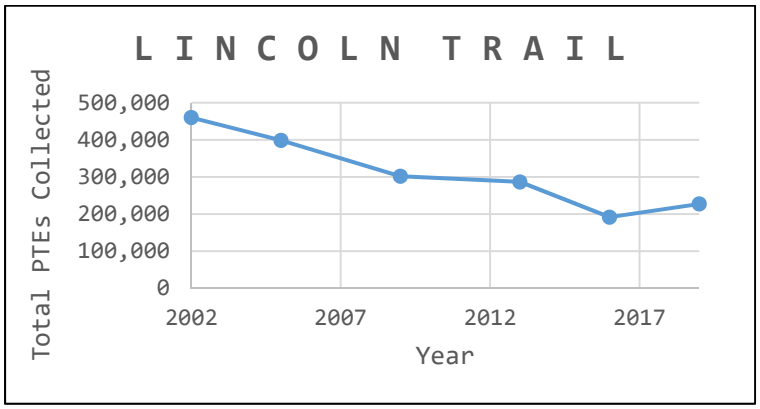
500,000
400,000
300,000
200,000
100,000
0
1999
2004
2009
2014
Year


L I N C O L N T R A I L
Total PTEs Collected
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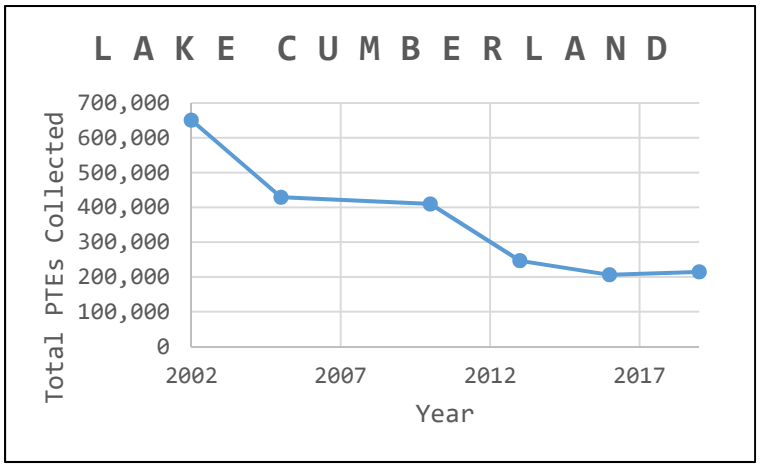
400,000
300,000
200,000
100,000
0
2002
2007
2012
2017
Year


L A K E C U M B E R L A N D
Total PTEs Collected
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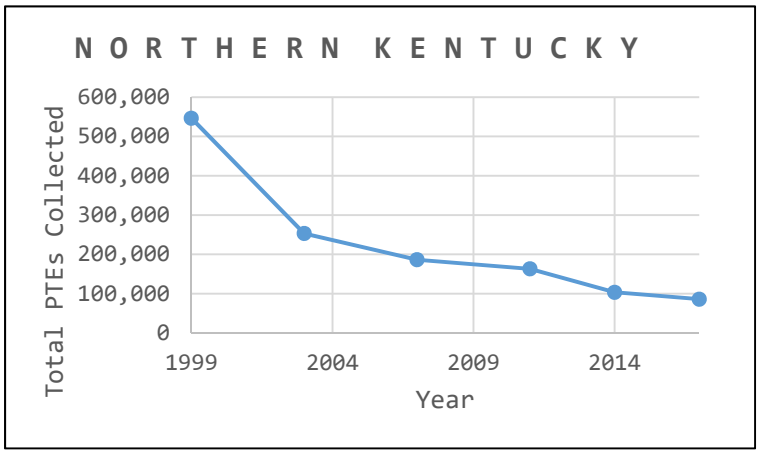
600,000
500,000
400,000
300,000
200,000
100,000
0
2002
2007
2012
2017
Year


NORTHERN KENTUCKY
Total PTEs Collected
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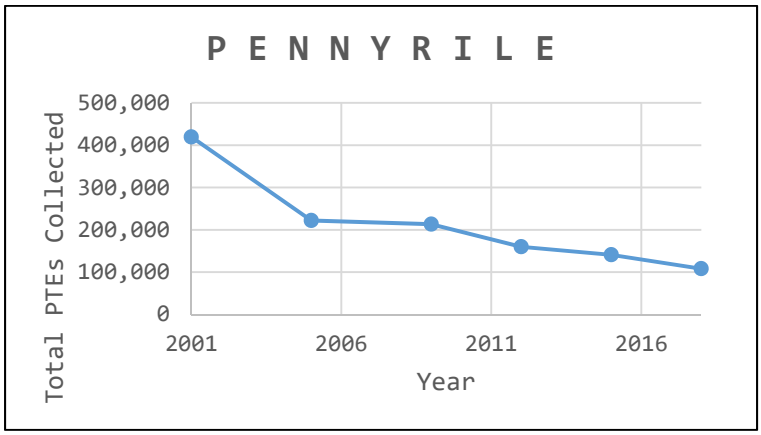
500,000
400,000
300,000
200,000
100,000
0
1999
2004
2009
2014
Year


PENNYRILE
Total PTEs Collected
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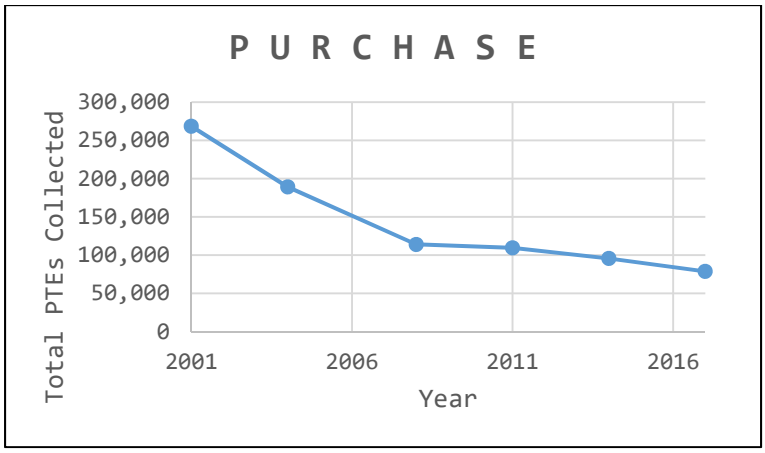
400,000
300,000
200,000
100,000
0
2001
2006
2011
2016
Year


PURCHASE
Total PTEs Collected
300,000
250,000
200,000
150,000
100,000
50,000
0
2001
2006
2011
2016
Year

ACRONYMS

ADD	Area Development District
ATSDR	Agency for Toxic Substances and Disease Registry
BGAD	Bluegrass Army Depot
BTU	British Thermal Unit
CDC	Centers for Disease Control
CPSC	Consumer Product Safety Commission
CR/TDP	Crumb Rubber/Tire-Derived Products
DOR	Department of Revenue
DWM	Division of Waste Management
EEC	Energy and Environment Cabinet
EKPC	East Kentucky Power Cooperative
EPA	U.S. Environmental Protection Agency
FIVCO	Area Development District including Boyd, Carter, Elliott, Greenup, and Lawrence Counties
FRAP	Federal Research Action Plan
GHG	Greenhouse Gas
KIPDA	Kentuckiana Regional Planning and Development Agency
KYTC	Kentucky Transportation Cabinet
OMU	Owensboro Municipal Utility
PSC	Public Service Commission
PTE	Passenger Tire Equivalent
RLA	Recycling and Local Assistance
RMA	Rubber-Modified Asphalt
TDA	Tire-Derived Aggregate
TDF	Tire-Derived Fuel
WTCE	Waste Tire Collection Event
WTTF	Waste Tire Trust Fund
WTWG	Waste Tire Working Group

Photo 9: Liberty Tire, Marion, KY
Photo by Ty Collins

Kentucky Division of Waste Management
300 Sower Boulevard, Second Floor
Frankfort, KY 40601
Report an Environmental Emergency, 24 hours to Environmental Response Team
502-564-2380 or 800-928-2380