

SECTION II – Sectors of the Missouri Waste Stream

THE CONSTRUCTION WASTE SECTOR

Construction and Demolition waste loads were assessed separately instead of combining them into a collective C&D category. The reasoning was that construction waste is cleaner and more easily separated than demolition waste. Therefore if a material recycling program was instituted it would be easier to source separate and reclaim construction waste. Waste was classified as demolition if the materials were attached to each other, pulverized, or unable to be easily separated. Construction waste is normally delivered to a waste facility in a roll-off container brought directly from the construction site.



Construction loads normally contained several construction materials such as the one pictured on the left. Each of these loads was visually inspected and the weight of each material was estimated and expressed as a percentage of the entire load. That percentage was then applied to the scale weights to determine the weight of the material.

The Construction waste sector consisted of seven components:

Wood: Construction waste wood is predominantly new wood and not attached to other materials. Wood waste includes plywood, chipwood, dimensional lumber (2x4's, etc.), wood pallets, shavings and sawdust. Wood waste made up over half (51%) of the construction waste observed.



Drywall: Gypsum wallboard is a waste product from new construction. The drywall observed was usually unused with no nails or wood attached. Construction drywall waste made up 5.9% of the construction waste observed.

Masonry: Masonry waste consists of inert materials such as brick, concrete, rock, and dirt that originated at a construction site. Construction masonry is “cleaner” and “newer” than demolition masonry materials and in most cases looked like ‘clean fill’. Masonry materials from construction sites made up 7% of all construction waste.



Metal: Metal construction waste consisted of metal studs, aluminum siding, metal beams, metal dry wall strips, pipes, etc. Metal construction waste consisted of 3.4% of the entire construction waste sector.

Plastic: Plastic construction waste consisted of PVC pipe, vinyl siding, plastic buckets, Styrofoam insulation, and plastic sheeting. Plastic construction waste made up 8.4% of the construction waste sector.



Cardboard: Cardboard consists of boxes, box board, and cardboard packing materials. Cardboard waste made up 9.1% of the construction waste sector.



Other Construction Waste: All other materials originating from a new construction site was categorized as other construction waste. Other construction waste materials made up 5.2% of the construction waste sector.



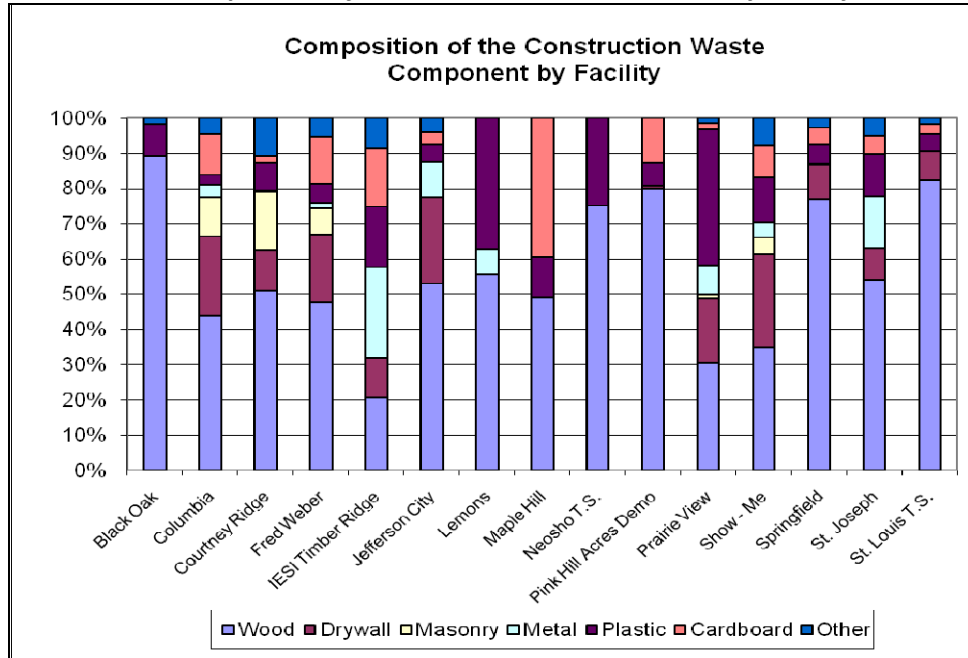
Construction Waste Sector Findings

Based on the observations at 15 facilities throughout Missouri during the study period, about 1.6% of the total waste in Missouri is construction waste. This amount varied between waste facilities. The largest amount of construction waste received during the observation week was at the City of Columbia landfill. The smallest amount was received at the Neosho Transfer Station.

Table II-1: Construction Waste by Facility

Waste Facility	Tonnage Wood	Tonnage Drywall	Tonnage Masonry	Tonnage Metal	Tonnage Plastic	Tonnage Cardboard	Tonnage Other	Tonnage Total
Black Oak	14.7	0	0	0	1.5	0	0.3	16.5
Columbia	71.6	37.2	18.2	5.8	4.8	18.7	7.8	164.1
Courtney Ridge	69.1	15.7	22.6	0.4	10.8	2.8	14.5	135.9
Fred Weber	177.2	71.7	28.7	4.9	20.2	50.1	20.2	373
IESI Timber Ridge	5.5	3	0	6.9	4.6	4.4	2.3	26.7
Jefferson City	13.1	6	0	2.5	1.2	0.9	1	24.7
Lemons	5.5	0	0	0.7	3.7	0	0	9.9
Maple Hill	3.1	0	0	0	0.7	2.5	0	6.3
Neosho T.S.	1.8	0	0	0	0.6	0	0	2.4
Pink Hill Acres Demo	28.4	0.3	0	0	2.2	4.6	0	35.5
Prairie View	17.3	10.7	0.6	4.7	22	1	0.9	57.2
Show - Me	4.3	3.3	0.6	0.5	1.6	1.1	1	12.4
Springfield	33.7	4.4	0.1	0	2.3	2.2	1.2	43.9
St. Joseph	28.4	4.7	0	7.6	6.4	2.7	2.7	52.5
St. Louis T.S.	43.9	4.4	0	0	2.6	1.5	1	53.4
Totals	517.6	161.4	70.8	34	85.2	92.5	52.9	1014.4

Chart II-1: Percent Composition of Construction Waste Observed by Facility

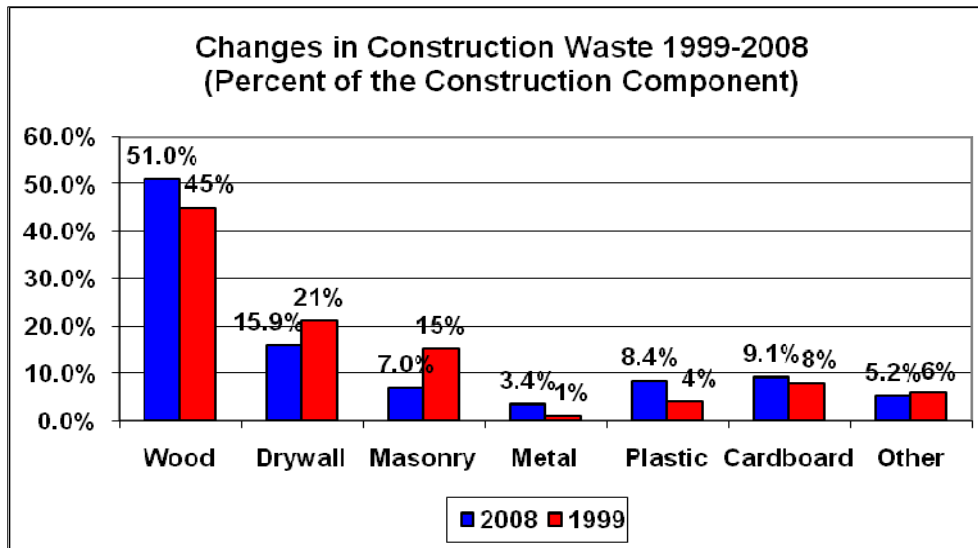


Changes in the Construction Waste Sector

The percentage of construction waste was significantly lower in 2008 than it was during the 1999 study. The percentage of construction waste dropped from 5.5% in 1999 to 1.6% in 2008. According to the National Association of Home Builders (NAHB) housing starts in the Midwest region have dropped from 347 (thousands of units) in 1999 to 135 in 2008.

Housing starts are defined as the start of construction of a privately-owned housing unit when excavation begins for the footings or foundation of a building intended primarily as a housekeeping residential structure and designed for nontransient occupancy. This drop in residential construction correlates with the decrease in construction waste from 1999 to 2008 as noted above.

Chart II-2: Construction Waste Changes from 1999-2008



Conclusions:

Based on the percentage of construction waste observed during the study, approximately 95,468 tons of construction waste was disposed in 2007 (1.6% of 6,364,557 tons). Many of the components observed during the study are materials that can be reused or recycled, reducing the amount of waste being disposed. The table below estimates the amount of construction materials discarded in 2007.

Table II-2: Estimated Construction Waste - 2007

Construction Waste	Estimated Tons - 2007	Pct. of Total Waste
Wood	48689	0.82%
Drywall	15179	0.25%
Masonry	6683	0.11%
Metal	3246	0.05%
Plastic	8019	0.13%
Cardboard	8688	0.15%
Other	4964	0.08%
Total	95468	1.60%

THE DEMOLITION WASTE SECTOR

Demolition waste is normally ‘lumped’ together with construction waste and characterized as construction/demolition (C&D) waste. However, the demolition sector of C&D is quite different from the construction waste sector. Construction waste tends to be more homogeneous, cleaner, newer, unattached, and for the most part easier to separate and recover than the demolition waste sectors. Demolition waste tends to be mixed materials, older materials, attached materials, and much more difficult to separate and recover.

Waste was classified as demolition if the materials were attached to each other, pulverized, or unable to be easily separated. Demolition waste is normally delivered to a waste facility in a roll-off container brought directly from a demolition or renovation site. Most of the mixed demolition waste loads look like a bulldozer flattened a structure and the waste was dumped into the back of a truck with a scoop or grab claw.

Demolition loads normally contained several construction materials such as the one pictured on the right. The load on the left came from a store renovation, the load on the right came from a house demolition. In either case it would be difficult to separate out just one material for recovery.



Each of these loads was visually inspected and the weight of each material was estimated and expressed as a percentage of the entire load. That percentage was then applied to the scale weights to determine the weight of the material.

The Demolition waste sector consisted of seven components:

Wood: Demolition waste wood is typically weathered, painted, and in many cases attached to other materials. The demolition load on the right is mixed with several materials and the wood is attached with nails and screws. Wood waste was the largest component and made up 47.4% of the demolition waste sector.



Drywall: Demolition drywall is gypsum wallboard that has been removed from a structure during demolition. The drywall observed was usually in small pieces, painted, and often attached to wood or metal studs. Demolition drywall waste made up 9.1% of the demolition waste observed.



Roofing: Demolition Roofing materials were comprised mostly of roofing shingles that were torn off of existing roofs in anticipation of putting new shingles on the structure. In most cases these shingles were delivered to the landfill in dump trucks or trailers. Some loads were homogeneous while others were mixed with wood scraps as shown in the photo on the left. Roofing made up 21.4% of the demolition waste sector.

Masonry: Demolition masonry consists of inert materials such as brick, concrete, rock, and dirt that originated at a demolition site. Demolition masonry materials were mixed with other materials and in most cases could not be used as 'clean fill'. Demolition masonry made up 13.8% of the demolition waste sector.



Metal: Demolition metal waste consisted of a variety of items. They included the normal construction type materials such as metal studs, aluminum siding, metal beams, metal dry wall strips, pipes, etc. Demolition metal waste also contained old metal equipment that was removed from facilities. Metal demolition waste consisted of 1.6% of the entire demolition waste sector.



Carpet: Carpet came to the landfills and transfer stations in two ways. The picture on the left shows a homogeneous load of carpet removed from buildings. Carpet also arrived mixed with other materials. The demolition carpet component comprised 5.4% of the demolition waste sector.

Other: Other demolition materials consisted of everything not listed previously that was removed and disposed of during the renovation and or demolition of a structure. These items included fiberglass and cellulose insulation, roofing insulation board, plastics, and small amounts of MSW and bulky items. The other demolition component waste made up 1.3% of the demolition waste sector.



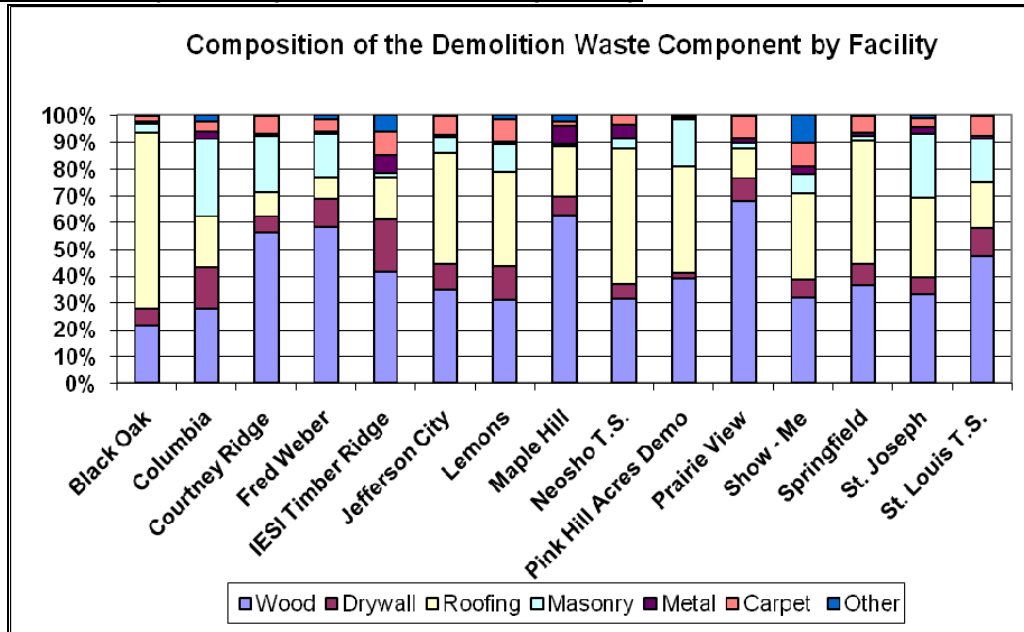
Demolition Waste Sector Findings

Based on the observations at 15 facilities throughout Missouri during the study period, about 13.2% of the total waste in Missouri is demolition waste. This amount varied between waste facilities. The largest amount of demolition waste received during the study period was at the Fred Weber landfill. The smallest amount was received at the Neosho Transfer Station.

Table II-3: Demolition Waste Observed by Facility

Waste Facility	Tonnage Wood	Tonnage Drywall	Tonnage Roofing	Tonnage Masonry	Tonnage Metal	Tonnage Carpet	Tonnage Other	Tonnage Total
Black Oak	27.4	8	83.9	4.3	0.8	2.8	0.3	127.5
Columbia	199	111.9	138.1	211.2	20.3	26.6	17.1	724.2
Courtney Ridge	654.9	70.4	103.9	247.1	10.6	71.2	7	1165.1
Fred Weber	1146.2	205	166.6	316.2	12.8	92.8	31.3	1970.9
IESI Timber Ridge	124.5	58.6	47.1	5.3	19	26.9	18.8	300.2
Jefferson City	233.7	63.3	275.7	42.9	3.1	48.1	2.2	669
Lemons	100.3	42.3	115.7	33	2.6	27.2	5.9	327
Maple Hill	146	16.8	43.5	2	16	3.5	6.1	233.9
Neosho T.S.	16.4	3.1	26.5	2.1	2.6	2	0	52.7
Pink Hill Acres Demo	258.5	13.1	265.5	116.5	1.1	7.7	0.1	662.5
Prairie View	643	82.5	104.7	21.2	19.2	76.4	3.1	950.1
Show - Me	51.2	11.3	52.3	11.8	5	13.6	17.3	162.5
Springfield	177.3	36.9	222.2	9.3	5.6	31.3	0.8	483.4
St. Joseph	157.2	29.7	141.3	114.4	11.6	15.9	5.1	475.2
St. Louis T.S.	122.6	28.3	44.5	42.2	3	19.7	0.4	260.7
Totals	4058.2	781.2	1831.5	1179.5	133.3	465.7	115.5	8564.9

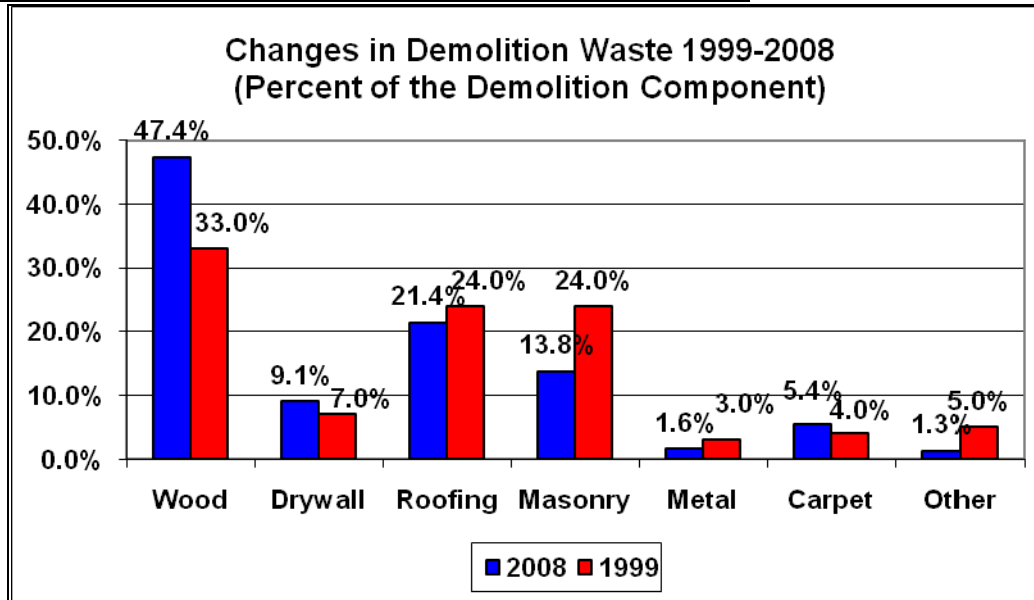
Chart II-3: Composition of Demolition Waste by Facility



Changes in the Demolition Waste Sector

The percentage of demolition waste was about the same in 2008 than it was during the 1999 study. The percentage of demolition waste rose slightly from 13.0% in 1999 to 13.2% in 2008. The downturn in the economy in 2008 did not seem to significantly reduce the amount of demolition waste.

Chart II-4: Demolition Material Waste Changes from 1999-2008



Conclusions:

Based on the percentage of demolition waste observed during the study, approximately 840,122 tons of demolition waste was disposed in 2007 (13.2% of 6,364,557 tons). Many of the components observed during the study are materials that can be reused or recycled, reducing the amount of waste being disposed. The table below estimates the amount of demolition materials discarded in 2007.

Table II-4: Estimated Demolition Waste - 2007

Demolition Waste	Estimated Tons - 2007	Pct. of Total Waste
Wood	398218	6.26%
Drywall	76451	1.20%
Roofing	179786	2.82%
Masonry	115936	1.82%
Metal	13442	0.21%
Carpet	45367	0.71%
Other	10922	0.17%
Total	840122	13.20%

THE INDUSTRIAL WASTE SECTOR

Industrial waste is difficult to define. In the broadest sense all waste from commercial operations could fall into the industrial waste sector. The waste from a fast food restaurant is technically industrial processed waste because the waste (food scraps, paper, plastic) are all part of the manufacturing process resulting from the creation of a product. However, it is difficult to separate this waste from the normal MSW loads because this waste is collected by packer trucks that collect a variety of other wastes. The packer truck that collects the fast food restaurant typically makes hundreds of other stops at other small businesses, institutional facilities, and residences.

For the purposes of this study industrial waste fell into one or more of the following:

- Waste from an industrial, manufacturing, or commercial operation
- Waste that was visually homogeneous (all the same)
- Waste from a single generator and not combined with other generators
- Waste delivered to the landfill or transfer station in a dump truck, open top roll-off, or compactor unit

Industrial waste is normally separated from other materials and therefore easier to separate for recovery if there is value in the recovered material. The load of pallets on the right is 100% industrial wood (the byproduct of an industrial process). Like the other waste sectors, each of these loads was visually inspected and the weight of each material was estimated and expressed as a percentage of the



entire load. That percentage was then applied to the scale weights to determine the weight of the material.

The Industrial waste sector consisted of nine components:

Cardboard: Industrial cardboard consists of corrugated containers (whole, flattened, shredded, or baled). The industrial cardboard load on the right is mixed with several other materials. Cardboard is light but voluminous until compacted. Industrial cardboard made up 19.2% of the industrial waste sector. Cardboard boxes are easily recycled and could significantly reduce the amount of waste transported to, and received by the waste facilities.



Paper: Industrial paper included packing materials, wrapping waste, overruns from printing and office paper from a single source generator. The industrial paper on the right is waste gift wrap. Industrial paper waste made up 2.2% of the industrial waste observed.



Food: Industrial food was defined as human or animal food waste resulting from processing or overruns. Most loads were homogeneous such as the “chicken parts” shown in the photo on the left. Industrial food waste made up 11.9% of the industrial waste sector.

Metal: Industrial metal waste was defined as metallic wastes from a single source. Metallic sludge or byproducts from a smelting operation were listed in the “industrial other” category. The cans from a beverage processor on the right were out of date. Some were filled with liquid and some were empty. Industrial metal made up 1.0% of the industrial waste sector.



Wood: Industrial wood waste included wooden pallets, crating, and processed waste from manufactures such as wood shavings and sawdust. Pallets were the biggest material item in this category. Wood waste made up 14.3% of the entire industrial waste sector.



Plastics: Industrial plastic was defined as all manufactured plastic, plastic processed wastes, plastic packing materials and plastic resin sludge. The picture on the left is a polyvinyl plastic from a plastics manufacturer. Like cardboard, plastic is usually light but very voluminous. The industrial plastic component comprised 8.2% of the industrial waste sector.



Textiles: Industrial textiles included clothing, rags, and processed cloth waste from a single source. The picture on the left is textile waste from a clothing manufacturer. Industrial textiles made up 0.9% of the industrial waste sector.

Rubber: Industrial rubber waste includes auto and truck tires (Missouri laws requires tires to be shredded, split, or quartered if they are put into a landfill), and processed rubber waste materials and overruns from rubber manufacturers. The picture on the right is rubber waste from a belt manufacturer. Industrial rubber waste made up 3.0% of the industrial waste sector.



Other: Other industrial waste included all wastes from industrial sources that were not listed in the previous eight components. These material wastes included auto fluff, foundry sand, aluminum ore waste, and carbon black. The picture on the right is auto fluff and that was the most common industrial waste material. The industrial other waste component made up 39.3% of the industrial waste sector. This was by far the largest component of the industrial waste and auto fluff was by far the biggest material in this category.



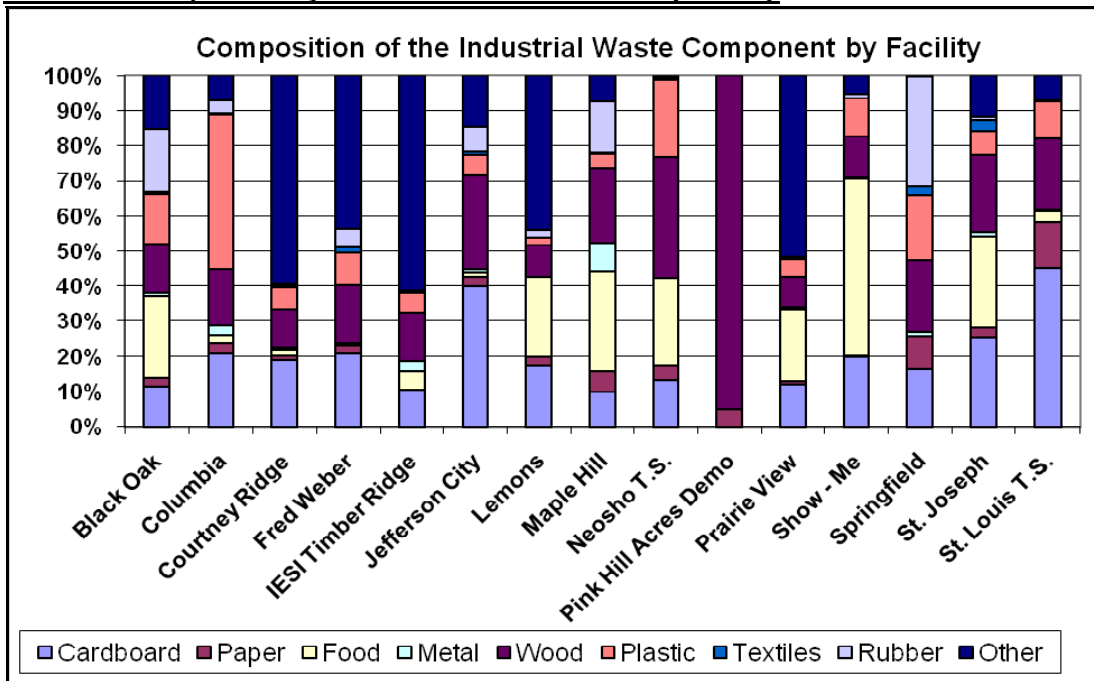
Industrial Waste Sector Findings

Based on the observations, about 10.7% of the total waste in Missouri is industrial waste. This amount varied between waste facilities. The largest amount of industrial waste received during the observation week was at the Courtney Ridge landfill. The smallest amount was received at the Pink Hill Acres Demolition Landfill.

Table II-5: Industrial Waste Observed by Facility

Waste Facility	Tonnage Cardboard	Tonnage Paper	Tonnage Food	Tonnage Metal	Tonnage Wood	Tonnage Plastic	Tonnage Textiles	Tonnage Rubber	Tonnage Other	Tonnage Total
Black Oak	8.5	1.9	17.5	0.8	10.5	10.7	0.5	13.5	11.4	75.3
Columbia	40.2	5.7	4	5.6	30.8	85.4	0.5	6.9	14	193.1
Courtney Ridge	412.6	29.5	38.7	14.8	239.4	134.4	16.9	5.8	1311.2	2203.3
Fred Weber	216	22.3	2.3	2.9	168.8	95.5	17.5	53	448.6	1026.9
IESI Timber Ridge	36.2	1.4	19.2	10	51.3	20.3	0	2.5	222.7	363.6
Jefferson City	115.1	7.4	3.8	2.8	76.9	17.1	2.9	20.2	42	288.2
Lemons	84.3	12.5	112.6	0	43.9	11.6	0	10.5	216.5	491.9
Maple Hill	17.9	11.4	52.7	14.6	39.9	7.9	0.1	26.8	13.9	185.2
Neosho T.S.	14.4	4.5	27.3	0	37.7	23.9	1.1	0.2	0.2	109.3
Pink Hill Acres Demo	0	0.3	0	0	5.9	0	0	0	0	6.2
Prairie View	121.8	9.8	209.4	5.9	87.7	50.8	4.2	2.9	528.4	1020.9
Show - Me	88.9	1.5	226.3	2	51.8	48.6	0	5.8	24	448.9
Springfield	34.7	19.6	0	3.2	43.2	40	5.2	66.5	0.9	213.3
St. Joseph	164.3	19.7	168.5	8.4	143.8	46.1	20.2	5.4	76.7	653.1
St. Louis T.S.	69.5	19.6	5.2	0.2	31.6	16.2	0.3	0	11	153.6
Total	1424.4	167.1	887.5	71.2	1063.2	608.5	69.4	220	2921.5	7432.8

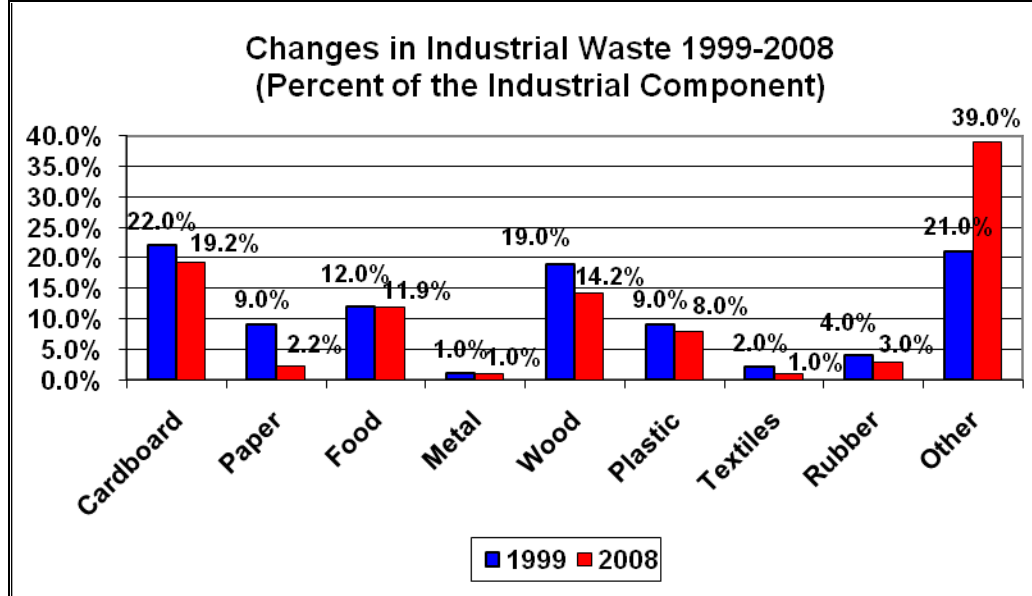
Chart II-5: Composition of Industrial Waste Observed by Facility



Changes in the Industrial Waste Sector

The percentage of industrial waste dropped slightly from 11.8% in 1999 to 10.7% in 2008.

Chart II-6: Industrial Waste Changes from 1999-2008



Conclusions:

Based on the percentage of industrial waste observed during the study, approximately 681,008 tons of industrial waste was disposed in 2007 (10.7% of 6,364,557 tons). Many of the components observed during the study are materials that can be reused or recycled, reducing the amount of waste being disposed. The table below estimates the amount of industrial materials discarded in 2007.

Table II-6: Estimated Industrial Waste - 2007

Industrial Waste	Estimated Tons - 2007	Pct. of Total Waste
Cardboard	130753	2.05%
Paper	14982	0.24%
Food	81040	1.27%
Metal	6810	0.11%
Wood	97385	1.53%
Plastic	55843	0.88%
Textiles	6129	0.10%
Rubber	20430	0.32%
Other	267636	4.21%
Total	681008	10.70%

THE 'OTHER' WASTE SECTOR

In the 1999 Missouri Waste Composition Study all materials that were not MSW, construction waste, demolition waste or industrial waste was classified as 'Other' waste. The four components of 'other' waste were bulky items, asbestos, soil, and other materials (mostly sludge and commercial yard waste). For purposes of this study, the Missouri Department of Natural Resource's Solid Waste Management Program split the 'Other' sector into two waste sectors, creating an 'Other' waste sector and a 'Special' waste sector. The 'Other' waste sector is now defined as municipal sewage sludge, unidentified sludge, commercial yard waste and stumps, and all other unidentified materials.

The 'Other' waste sector was easily identifiable from the waste sectors listed previously. Each of these loads was visually inspected and the weight of each material was estimated and expressed as a percentage of the entire load. That percentage was then applied to the scale weights to determine the weight of the material.

The 'Other' waste sector consisted of two components:

Sludge: Sludge was defined as Municipal sewage sludge from a wastewater plant, sludge containing animal waste, or unidentifiable sludge materials of unknown origins. Most of the waste in this component was sewage sludge. The load on the right is dewatered chicken sludge (chicken waste). Sludge made up 36% of the 'Other' waste sector.



Tree Trunks: Yard waste is banned from Missouri landfills. However, large tree limbs, tree trunks, and stumps are permitted. Some facilities enforced the ban very well and a minimal amount of this waste was seen. When banned yard waste was observed it was put into this waste sector. The picture on the right is a combination of stumps, limbs and roots. The tree trunk component made up about 64% of the 'Other' waste sector.



'Other' Waste Sector Findings

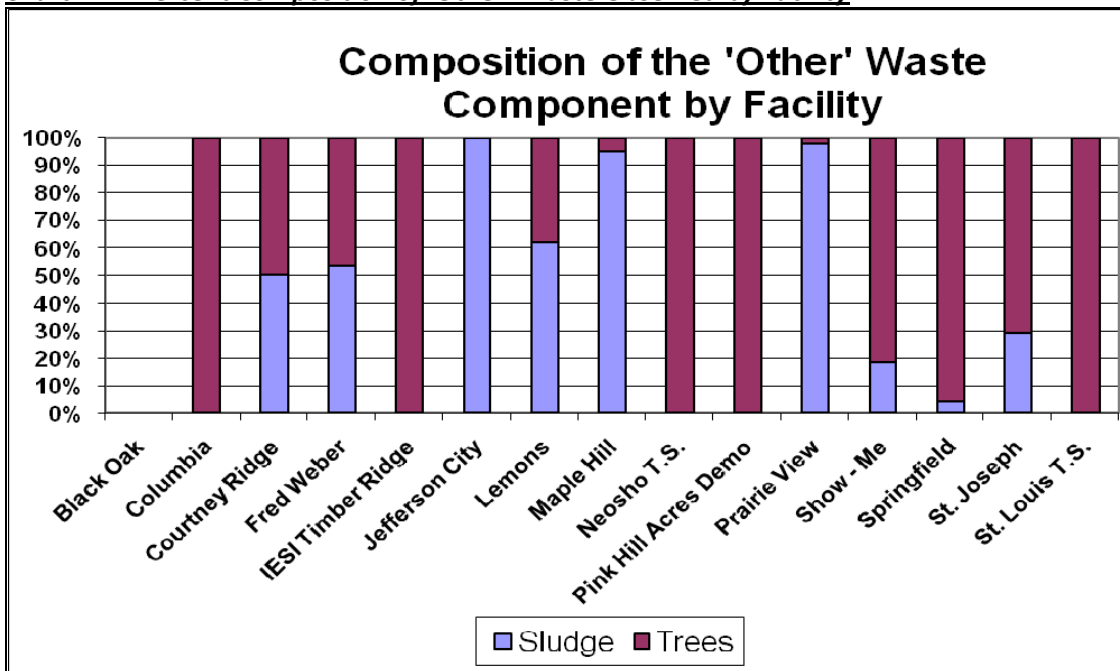
Based on the observations at 15 facilities throughout Missouri during the study period, about 2.5% of the total waste in Missouri is sludge and tree materials (Other) waste. This amount varied between waste facilities. The largest amount of "Other" waste received was during the observation week of 8/4-8/8/2008 at the St. Louis Transfer Station. This transfer station received large amounts of yard waste from the City of St. Louis, and this yard waste appeared to be contaminated with MSW and therefore could not be ground up for mulch/composting. Waste from this transfer station is shipped to a landfill in Illinois. At the time the observation activities were being conducted, former Governor Matt Blunt had issued Executive Order 08-26 extending the authority granted to the Director of the Missouri Department of Natural Resources to waive or suspend temporarily the operation

of statutory or administrative rules or regulations to expedite the cleanup and recovery process from the severe storms and subsequent flooding that began on June 1, 2008. A subsequent press release was issued by the department notifying the public that a temporary waiver of the ban on yard waste was being issued so storm debris could be landfilled in the state.

Table II-7: 'Other' Waste Observed by Facility

Waste Facility	Tonnage Sludge	Tonnage Trees	Tonnage Total
Black Oak	0	0	0
Columbia	0	10.2	10.2
Courtney Ridge	129.7	126.6	256.3
Fred Weber	200.2	174.6	374.8
IESI Timber Ridge	0	9.4	9.4
Jefferson City	2	0	2
Lemons	10.5	6.3	16.8
Maple Hill	9.8	0.5	10.3
Neosho T.S.	0	0.5	0.5
Pink Hill Acres Demo	0	1	1
Prairie View	156.7	3	159.7
Show - Me	27	119	146
Springfield	5.2	111.2	116.4
St. Joseph	7.3	17.5	24.8
St. Louis T.S.	0	402.7	402.7
Total	548.4	982.5	1530.9

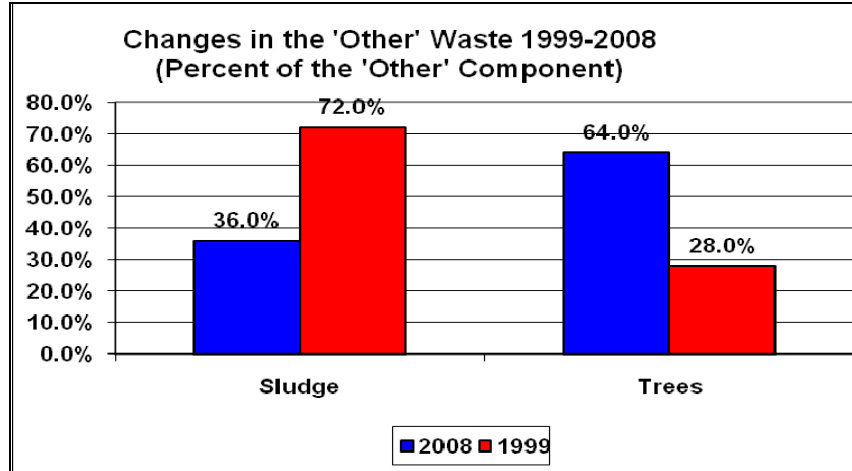
Chart II-7: Percent Composition of 'Other' Waste Observed by Facility



Changes in the 'Other' Waste Sector

The percentage of 'other' waste was about two and a half times larger in 2008 than it was during the 1999 study. The percentage of 'other' waste increased from 1.0% in 1999 to 2.5% in 2008.

Chart II-8: 'Other' Material Waste Changes from 1999-2008



Conclusions:

Based on the percentage of 'other' waste observed during the study (2.5%); approximately 159,114 tons of sludge and tree related material waste was disposed in 2007 (2.5% of 6,364,557 tons). The table below estimates the amount of 'Other' materials discarded in 2007.

Table II-8: Estimated Other Waste – 2007

Other Waste	Estimated Tons - 2007	Pct. of Total Waste
Sludge	57281	0.90%
Tree Trunks	101833	1.60%
Total	159114	2.50%

THE SPECIAL WASTE SECTOR

The 1999 Missouri Waste Composition Study classified all materials that did not apply to previously defined waste sectors as the 'Other' waste sector. The Missouri Department of Natural Resource's Solid Waste Management Program split this sector into two waste sectors for the 2008 study. A 'Special' waste sector was added to better define the materials that do not fit into any of the previous categories. For the purposes of this study, Special waste includes bulky items (furniture, mattresses, large fixtures, etc.), asbestos, soil (contaminated by a pollutant), tritium (exit signs), and electronic waste.

Bulky waste and electronic wastes were usually combined with other waste sectors. Soil and asbestos were delivered to the landfill as homogeneous loads. Each of the Special waste loads was visually inspected and the weight of each material was estimated and expressed as a percentage of the entire load. That percentage was then applied to the scale weights to determine the weight of the material.

The Special waste sector consisted of five components:

Bulky Items: Bulky items are defined as MSW in origin but too large to be included with normal MSW bag waste. Bulky items include furniture, mattresses, box springs, bicycles, and non-electronic appliances. The picture on the right is typical of most bulky loads. Bulky items made up 13% of the special waste sector.



Soil: The soil waste component includes both contaminated and non contaminated soils. The soils come from Brownfield developments, petroleum spills, underground storage tank excavations, etc. The picture on the left is a load of soil that was contaminated by petroleum near an underground storage tank. Soil waste was very dense and made up 62% of the special waste sector.

Asbestos: Asbestos was used in insulation materials for several decades before it was found to be harmful to humans. The small fibers within the asbestos settle in the lung and cause serious health problems. For this reason asbestos is treated very differently when it is disposed in landfills. When an asbestos load reaches the landfill all non essential personnel are cleared from the area and the asbestos is buried and covered with waste or soil. The picture on the right shows boxed asbestos ready to be covered. Asbestos made up 26% of the special waste sector.



Tritium: Tritium is a substance used in commercial exit signs. No tritium was observed during the 691 hours of observation at the 15 waste facilities.

Electronic Waste: The study used the Wikipedia definition of electronic waste as any appliance made primarily of surplus, obsolete, broken or discarded electrical or electronic devices. Very small amounts of e-scrap were observed. The picture on the right is a big screen TV. E-scrap made up only 0.1% of the special waste sector.



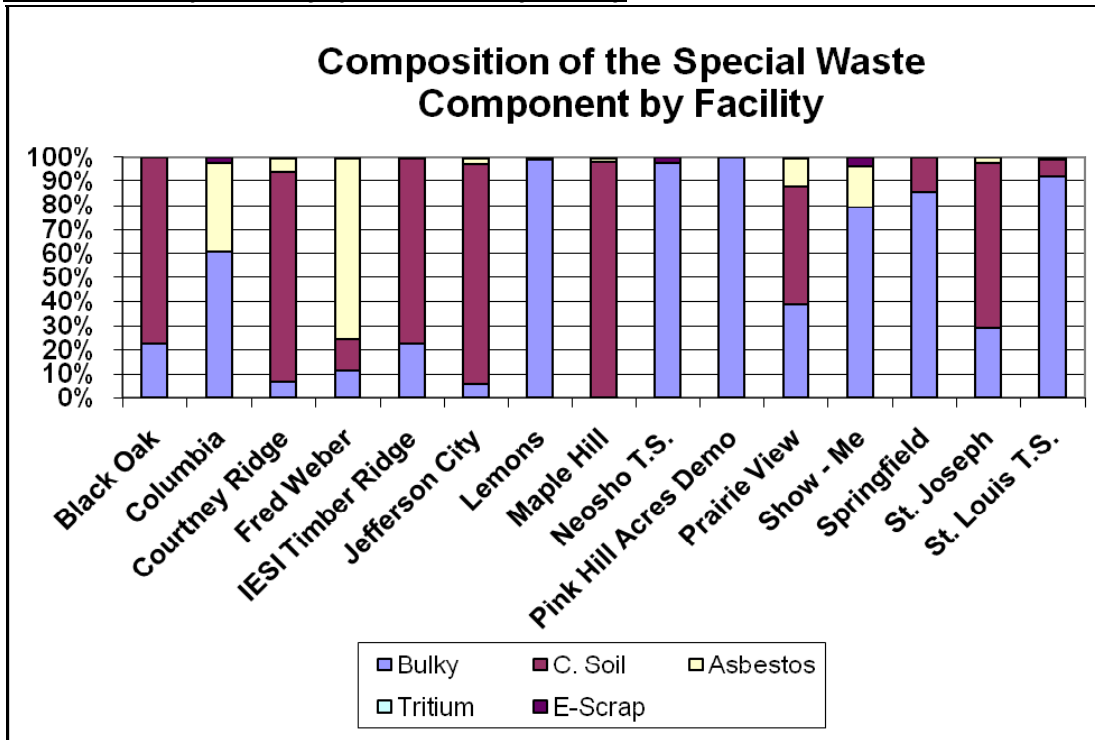
Special Waste Sector Findings

Based on the observations, about 13.5% of the total waste in Missouri is special waste as defined by the Missouri Department of Natural Resource's Solid Waste Management Program. This amount varied between waste facilities. The largest amount of special waste received during the observation week was contaminated soil at the Courtney Ridge Landfill. The smallest amount was at the Pink Hill Acres Landfill.

Table II-9: Special Waste Observed by Facility

Waste Facility	Tonnage Bulky	Tonnage C. Soil	Tonnage Asbestos	Tonnage Tritium	Tonnage E-Scrap	Tonnage Total
Black Oak	4.7	16	0	0	0	20.7
Columbia	53.9	0	32.5	0	1.9	88.3
Courtney Ridge	228.3	2917.5	187.1	0	3.1	3336
Fred Weber	301.5	343.5	2004.4	0	0.3	2649.7
IESI Timber Ridge	22.5	75.8	0	0	0.5	98.8
Jefferson City	41.5	600.5	16.1	0	0.2	658.3
Lemons	63.5	0	0	0	0.7	64.2
Maple Hill	12.1	1329.6	24.3	0	0.7	1366.7
Neosho T.S.	4.6	0	0	0	0.1	4.7
Pink Hill Acres Demo	0.9	0	0	0	0	0.9
Prairie View	93.8	117.5	28.6	0	0.1	240
Show - Me	18.2	0	4	0	0.8	23
Springfield	37.7	6.4	0	0	0	44.1
St. Joseph	54.7	126.1	4.2	0	0	185
St. Louis T.S.	216.9	15.4	0	0	2.6	234.9
Total	1154.8	5548.3	2301.2	0	11	9015.3

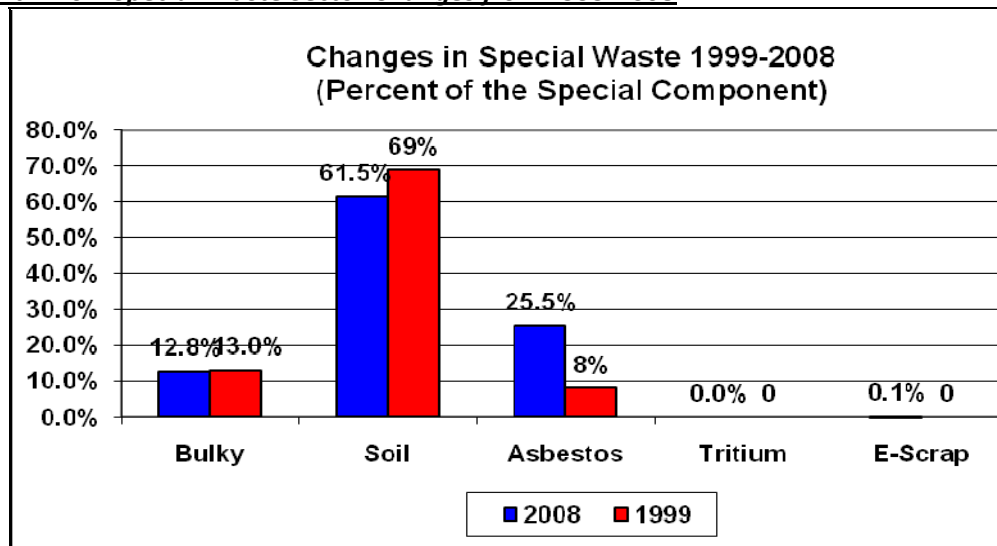
Chart II-9: Composition of Special Waste by Facility



Changes in the Special Waste Sector

The percentage of special waste increased from 9.2% in 1999 to 13.5% in 2008. Bulky items were virtually the same. The percentage of asbestos tripled from 9% in 1999 to 26% in 2008. The percentage of contaminated soil fell from 70% in 1999 to 61% in 2008.

Chart II-10: Special Waste Sector Changes from 1999-2008



Conclusions:

Based on the percentage of special waste observed during the study (13.5%); approximately 858,528 tons of special waste was disposed in 2007 (13.5% of 6,364,557 tons). The table below estimates the amount of special waste materials discarded in 2007.

Table II-10: Estimated Special Waste - 2007

Special Waste	Estimated Tons - 2007	Pct. of Total Waste
Bulky	109980	1.73%
Cont. Soil	528417	8.30%
Asbestos	219100	3.44%
Tritium	0	0.00%
E-Scrap	1031	0.02%
Total	858528	13.5%

THE MUNICIPAL SOLID WASTE (MSW) SECTOR

During this study, MSW loads were observed and recorded in order to determine what percentage of the entire waste stream was MSW. The MSW sector components were identified during the 2006-2007 study. The report in full can be viewed on the Missouri Department of Natural Resources Solid Waste Management Program web site.

(<http://www.dnr.mo.gov/env/swmp>) MWW sector components as identified in the 2006-2007 study are exhibited in the table below.

Table II-11: MSW Composition by Weight

MSW Components	Wt.(lbs.)	Pct. by Wt.
Cardboard	4884	8.20%
Newsprint	3076	5.17%
Magazines	2181	3.66%
High Grade Paper	3809	6.40%
Mixed Paper	6075	10.20%
TOTAL PAPER	20025	33.63%
Clear Glass	1616	2.71%
Brown Glass	1054	1.77%
Green Glass	374	0.63%
Other Glass	193	0.32%
TOTAL GLASS	3237	5.44%
Aluminum Cans	946	1.59%
Other Aluminum	200	0.34%
Non Ferrous	137	0.23%
Food Cans	1747	2.93%
Ferrous	518	0.87%
Oil filters	48	0.08%
TOTAL METALS	3596	6.04%
PET #1	1516	2.55%
HDPE #2	1129	1.90%
Plastic Film	2869	4.82%
Other Plastic	4756	7.99%
TOTAL PLASTIC	10270	17.25%
Food Waste	10254	17.22%
Wood Waste	709	1.19%
Textiles	2817	4.73%
Diapers	3264	5.48%
Other Organics	1766	2.97%
TOTAL ORGANICS	18810	31.59%
Fines	554	0.93%
Other Inorganics	1912	3.21%
TOTAL INORGANICS	2466	4.14%
HHW	547	0.92%
Electronic Waste	588	0.99%
TOTAL SPECIAL WASTE	1135	1.91%
TOTAL MSW		
SAMPLE COMPOSITION	59539	100%

Conclusions:

After observing and characterizing the overall waste stream, the percentage of MSW in Missouri is determined to be 58.3%. Based on the observation of all waste during the 2008 study, approximately 3,710,537 tons of MSW was disposed in 2007. The percentage and tonnage of MSW components for 2007 are in the following table.

Table II-12: Estimated Municipal Solid Waste - 2007

MSW Components	Estimated Tons - 2007	Pct. of Total Waste
Cardboard	304226	4.78%
Newsprint	191573	3.01%
Magazines	136202	2.14%
High Grade Paper	237398	3.73%
Mixed Paper	378691	5.95%
TOTAL PAPER	1248090	19.61%
Clear Glass	100560	1.58%
Brown Glass	65555	1.03%
Green Glass	23549	0.37%
Other Glass	12093	0.19%
TOTAL GLASS	201756	3.17%
Aluminum Cans	59190	0.93%
Other Aluminum	12729	0.20%
Non Ferrous	7637	0.12%
Food Cans	108834	1.71%
Ferrous	32459	0.51%
Oil filters	3182	0.05%
TOTAL METALS	224032	3.52%
PET #1	94195	1.48%
HDPE #2	70647	1.11%
Plastic Film	178844	2.81%
Other Plastic	296588	4.66%
TOTAL PLASTIC	640274	10.06%
Food Waste	639002	10.04%
Wood Waste	43915	0.69%
Textiles	175662	2.76%
Diapers	203666	3.20%
Other Organics	110107	1.73%
TOTAL ORGANICS	1172351	18.42%
Fines	34369	0.54%
Other Inorganics	119017	1.87%
TOTAL INORGANICS	153386	2.41%
HHW	34369	0.54%
Electronic Waste	36278	0.57%
TOTAL SPECIAL WASTE	70647	1.11%
TOTAL MSW	3710537	58.30%