

Chapter 18: Osage Beach

COMMUNITY PROFILE

The City of Osage Beach is located in Camden County in Central Missouri. It is part of the Lake of the Ozarks Solid Waste Management District (District T). Osage Beach is a popular tourist town due to its location on the Lake of the Ozarks and its large factory outlet shopping facilities. Modern Sanitation Transfer Station is located a few miles south of Osage Beach and receives waste from Camden and its surrounding counties. Osage Beach is 159 miles southwest of St. Louis, 92 miles northeast of Springfield, and 155 miles southeast of Kansas City.

Demographics:

	Osage Beach	Camden County
Area (sq. miles)	8.61	655.12
Population (1990)	2,609	27,495
Density (per sq. mile)	303.03	41.97
Pop. Change since 1980	32.4%	37.4%
Number of households	1,096	11,346
Persons per household	2.30	2.40
High school graduates	30.5%	38.7%
Median Family Income	\$31,875	\$25,363
Percent below poverty level	10.8%	12.6%

Solid Waste Collection

Solid waste collection is open to private haulers, although Modern Sanitation has approximately 80%-90% of the Lake of the Ozark area business. There are no territories, and no curbside recycling is offered in the Lake area.

Solid Waste Disposal

District T has two solid waste transfer stations: one in Osage Beach owned by Modern Sanitation and one in Eldridge owned by Waste Management. Modern Sanitation delivers its waste to a landfill in Jefferson City owned by Laidlaw. The transfer station accepts waste from Camden and the surrounding counties (Miller, Hickory, and the Lake areas). The transfer station receives approximately 20,000 tons of waste per year and the current gate tipping fee is \$44.00 per ton.

Waste Reduction and Recycling Programs

There is one major drop-off facility in District T. It is located in Camdenton and is owned by Waste Management. The facility accepts tin and aluminum cans, PET plastic, HDPE plastic, and glass. There are also small facilities in the area that accept some recyclables. Modern Sanitation does accept cardboard at the transfer station.

Modern Sanitation Results

Information about sample size and composition are listed in tables 18-1 to 18-8.

All weights are listed in pounds and all volumes are in cubic feet.

SORT #1

Sort Conditions

The first sort was conducted February 24-25, 1997. A site adjacent to the tipping area was selected as the sort location. The weather was mild and sunny. Traffic was very slow making it difficult to collect the maximum number of samples.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	307,692
Total Sample Weight (lbs)	1905.2
Significance Test Results	.000
Number of Samples Collected	10

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	3	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	1	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	4	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	5
Syringes	3	Alkaline Batteries	6
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	4		
Miscellaneous items: None.			
Total Weight (lb): 8.2			
Total Volume (cubic ft.): .4			

TABLE 18-1

MODERN SANITATION (OSAGE BEACH)

SORT # 1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	198	48.8	100%	0%	Drop-off	Lake Ozark/Village of Four Seasons (residential)
2	171	43.5	100%	0%	Drop-off	Lake Ozark/Village of Four Seasons (residential)
3	172	45.6	100%	0%	Drop-off	Osage Beach (rural)
4	184	38.3	100%	0%	Drop-off	Osage Beach (residential)
5	160	38.9	100%	0%	Drop-off	Osage Beach (residential)
6	242.2	56	100%	0%	Drop-off	Osage Beach (residential)
7	266	42.4	100%	0%	Drop-off	Osage Beach (residential)
8	171	47.3	100%	0%	Drop-off	Osage Beach (residential)
9	159	45.4	100%	0%	Drop-off	Osage Beach (residential)
10	182	36	100%	0%	Drop-off	Osage Beach (residential)
TOTALS	1905.2	442.2				
AVERAGE	190.52	44.2	100%	0%		

TABLE 18-1

MODERN SANITATION (OSAGE BEACH)

SORT # 1

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	128.1	53.0	12.8	5.3	6.72%	11.97%
Newsprint	117.5	26.2	11.8	2.6	6.17%	5.92%
Magazines	68.2	7.8	6.8	0.8	3.58%	1.76%
High Grade	57.5	12.6	5.8	1.3	3.02%	2.85%
Mixed	291.4	80.0	29.1	8.0	15.29%	18.08%
PAPER TOTALS	662.7	179.6	66.3	18.0	34.78%	40.58%
Clear	88.3	8.7	8.8	0.9	4.63%	1.97%
Brown	36.5	3.8	3.7	0.4	1.92%	0.86%
Green	16.1	1.1	1.6	0.1	0.85%	0.25%
Other	16.5	1.5	1.7	0.2	0.87%	0.34%
GLASS TOTALS	157.4	15.1	15.7	1.5	8.26%	3.41%
Alum. Cans	38.0	13.0	3.8	1.3	1.99%	2.94%
Other Alum	18.2	4.2	1.8	0.4	0.96%	0.95%
Non ferrous	7.8	0.7	0.8	0.1	0.41%	0.16%
Food Cans	62.0	10.9	6.2	1.1	3.25%	2.46%
Ferrous	25.5	3.9	2.6	0.4	1.34%	0.88%
Oil Filters	4.2	0.2	0.4	0.0	0.22%	0.05%
METAL TOTALS	155.7	32.9	15.6	3.3	8.17%	7.43%
PET # 1	37.0	12.8	3.7	1.3	1.94%	2.89%
HDPE # 2	40.6	20.0	4.1	2.0	2.13%	4.52%
Film	71.5	44.5	7.2	4.5	3.75%	10.05%
Other Plastic	133.2	58.0	13.3	5.8	6.99%	13.10%
PLASTIC TOTALS	282.3	135.3	28.2	13.5	14.82%	30.57%
Food Waste	411.3	43.2	41.1	4.3	21.59%	9.76%
Wood Waste	8.9	0.9	0.9	0.1	0.47%	0.20%
Textiles	59.2	11.9	5.9	1.2	3.11%	2.69%
Diapers	37.5	2.6	3.8	0.3	1.97%	0.59%
Other Organics	48.0	11.7	4.8	1.2	2.52%	2.64%
ORGANIC TOTALS	564.9	70.3	56.5	7.0	29.65%	15.88%
Fines	42.5	6.3	4.3	0.6	2.23%	1.42%
Other Inorganics	31.5	2.7	3.2	0.3	1.65%	0.61%
INORGANIC TOTALS	74.0	9.0	7.4	0.9	3.88%	2.03%
OTHER WASTE	8.2	0.4	0.8	0.0	0.43%	0.09%
GRAND TOTAL	1905.2	442.6	190.5	44.3	100.00%	100.00%

TABLE 18-2

SORT #2

Sort Conditions

The second sort was conducted May 19-20, 1997. The same location was used for sort activities as the previous sort. The weather was rainy and cool.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	307,692
Total Sample Weight (lbs)	2652.3
Significance Test Results	.000
Number of Samples Collected	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	4	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	2	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	5	Gardening/Yard Care Products	1
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	4
Syringes	0	Alkaline Batteries	47
Hardware/Shop Products	2	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
Miscellaneous items: 1 bottle of charcoal starter, 1 fire extinguisher.			
Total Weight (lb): 23.0			
Total Volume (cubic ft.): 1.0			

**MODERN SANITATION (OSAGE BEACH)
SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	160.1	44.7	50%	50%	Drop-off	Osage Beach
2	228	72.7	0%	100%	Drop-off	Osage Beach
3	154.9	46	100%	0%	Drop-off	Osage Beach
4	292.6	60.4	100%	0%	Drop-off	Osage Beach
5	236.4	45.4	80%	20%	Drop-off	Osage Beach
6	282	52.6	50%	50%	Drop-off	Osage Beach
7	261.2	48	0%	100%	Drop-off	Osage Beach
8	169.2	48	0%	100%	Drop-off	Osage Beach
9	246.9	53.1	90%	10%	Drop-off	Osage Beach
10	199.6	32.3	0%	100%	Drop-off	Osage Beach
11	159.4	44.1	90%	10%	Drop-off	Osage Beach
12	261.8	48.3	90%	10%	Drop-off	Osage Beach
TOTALS	2652.3	595.4				
AVERAGE	221.025	49.6	54%	46%		

TABLE 18-3

MODERN SANITATION (OSAGE BEACH)

SORT # 2

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	248.6	85.5	20.7	7.1	9.37%	14.36%
Newsprint	154.0	30.9	12.8	2.6	5.81%	5.19%
Magazines	88.9	10.2	7.4	0.9	3.35%	1.71%
High Grade	177.4	27.4	14.8	2.3	6.69%	4.60%
Mixed	297.7	77.3	24.8	6.4	11.22%	12.98%
PAPER TOTALS	966.6	231.3	80.6	19.3	36.44%	38.85%
Clear	122.0	9.0	10.2	0.8	4.60%	1.51%
Brown	88.4	7.0	7.4	0.6	3.33%	1.18%
Green	19.0	1.1	1.6	0.1	0.72%	0.18%
Other	7.5	0.9	0.6	0.1	0.28%	0.15%
GLASS TOTALS	236.9	18.0	19.7	1.5	8.93%	3.02%
Alum. Cans	55.3	28.8	4.6	2.4	2.08%	4.84%
Other Alum	14.8	4.6	1.2	0.4	0.56%	0.77%
Non ferrous	10.8	2.3	0.9	0.2	0.41%	0.39%
Food Cans	59.7	12.8	5.0	1.1	2.25%	2.15%
Ferrous	24.5	3.4	2.0	0.3	0.92%	0.57%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
METAL TOTALS	165.1	51.9	13.8	4.3	6.22%	8.72%
PET # 1	29.2	16.7	2.4	1.4	1.10%	2.80%
HDPE # 2	42.9	24.5	3.6	2.0	1.62%	4.11%
Film	80.3	55.3	6.7	4.6	3.03%	9.29%
Other Plastic	196.1	86.8	16.3	7.2	7.39%	14.58%
PLASTIC TOTALS	348.5	183.3	29.0	15.3	13.14%	30.79%
Food Waste	472.8	47.1	39.4	3.9	17.83%	7.91%
Wood Waste	28.0	3.9	2.3	0.3	1.06%	0.66%
Textiles	124.2	20.0	10.4	1.7	4.68%	3.36%
Diapers	111.7	10.8	9.3	0.9	4.21%	1.81%
Other Organics	105.2	18.0	8.8	1.5	3.97%	3.02%
ORGANIC TOTALS	841.9	99.8	70.2	8.3	31.74%	16.76%
Fines	54.7	8.1	4.6	0.7	2.06%	1.36%
Other Inorganics	15.6	2.0	1.3	0.2	0.59%	0.34%
INORGANIC TOTALS	70.3	10.1	5.9	0.8	2.65%	1.70%
OTHER WASTE	23.0	1.0	1.9	0.1	0.87%	0.17%
GRAND TOTAL	2652.3	595.4	221.0	49.6	100.00%	100.00%

SORT #3

Sort Conditions

The third sort was conducted September 25-27, 1997. The same location was used for sort activities as the previous sort. The weather was sunny and mild. The maximum number of samples were not gathered due to slow traffic and vector problems (yellow jackets, hornets, etc.).

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	307,692
Total Sample Weight (lbs)	2239.8
Significance Test Results	.000
Number of Samples Collected	10

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	0	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	12	Gardening/Yard Care Products	1
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	8
Syringes	19	Alkaline Batteries	9
Hardware/Shop Products	9	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	1		
Miscellaneous items: 1 bottle of leather dye, 2 butane lighters.			
Total Weight (lb): 12.5			
Total Volume (cubic ft.): 1.0			

**MODERN SANITATION (OSAGE BEACH)
SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	227.3	47.8	50%	50%	None	Musgrove, Bridal Cave
2	160	33.4	50%	50%	None	Laurie
3	239.2	47.6	100%	0%	None	Horseshoe Bend Lake (condos)
4	209.3	45.2	100%	0%	None	Horseshoe Bend Lake (condos)
5	185.5	36.3	85%	15%	None	Hermitage, Urbina
6	249.8	53.6	85%	15%	None	Hermitage, Urbina
7	259.6	53.4	80%	20%	Drop-off	Iberia (rural and lake area)
8	189.6	45.4	80%	20%	Drop-off	Iberia (rural and lake area)
9	203	53	100%	0%	None	Four Seasons (lake area)
10	316.8	63.4	50%	50%	Drop-off	Lake Ozark, Osage Beach
TOTALS	2239.8	479.1				
AVERAGE	223.98	47.9	78%	22%		

TABLE 18-5

MODERN SANITATION (OSAGE BEACH)**SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	173.0	57.5	17.3	5.7	7.72%	11.99%
Newsprint	186.4	27.8	18.6	2.8	8.32%	5.80%
Magazines	81.1	5.2	8.1	0.5	3.62%	1.08%
High Grade	63.9	18.9	6.4	1.9	2.85%	3.95%
Mixed	243.0	66.9	24.3	6.7	10.85%	13.95%
PAPER TOTALS	747.4	176.2	74.7	17.6	33.37%	36.77%
Clear	102.3	7.1	10.2	0.7	4.57%	1.48%
Brown	31.8	2.4	3.2	0.2	1.42%	0.50%
Green	29.9	2.1	3.0	0.2	1.33%	0.44%
Other	9.8	0.9	1.0	0.1	0.44%	0.19%
GLASS TOTALS	173.6	12.5	17.4	1.3	7.75%	2.61%
Alum. Cans	34.5	18.7	3.4	1.9	1.54%	3.90%
Other Alum	10.8	3.7	1.1	0.4	0.48%	0.77%
Non ferrous	0.8	0.2	0.1	0.0	0.04%	0.04%
Food Cans	70.6	15.6	7.1	1.6	3.15%	3.26%
Ferrous	19.9	3.0	2.0	0.3	0.89%	0.63%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
METAL TOTALS	136.5	41.2	13.7	4.1	6.09%	8.60%
PET # 1	36.8	22.5	3.7	2.3	1.64%	4.70%
HDPE # 2	47.0	32.6	4.7	3.3	2.10%	6.81%
Film	82.3	47.5	8.2	4.8	3.67%	9.92%
Other Plastic	120.1	61.5	12.0	6.2	5.36%	12.84%
PLASTIC TOTALS	286.1	164.1	28.6	16.4	12.77%	34.26%
Food Waste	507.6	35.6	50.8	3.6	22.66%	7.43%
Wood Waste	16.5	1.5	1.6	0.2	0.73%	0.31%
Textiles	52.6	13.9	5.3	1.4	2.35%	2.90%
Diapers	101.8	11.8	10.2	1.2	4.54%	2.46%
Other Organics	78.1	9.8	7.8	1.0	3.49%	2.05%
ORGANIC TOTALS	756.4	72.6	75.6	7.3	33.77%	15.15%
Fines	112.5	10.0	11.2	1.0	5.02%	2.09%
Other Inorganics	14.9	1.5	1.5	0.2	0.66%	0.31%
INORGANIC TOTALS	127.3	11.5	12.7	1.2	5.68%	2.40%
OTHER WASTE	12.5	1.0	1.3	0.1	0.56%	0.21%
GRAND TOTAL	2239.8	479.1	224.0	47.9	100.00%	100.00%

TABLE 18-6

SORT SUMMARY

Seasonal variations

- Aluminum cans and glass totals were higher during the second sort, probably due to increased tourist traffic for the lake during the summer.
- Fast food wrappings and containers made up a good portion of mixed paper totals.
- Food waste increased during the second sort due to more “picnic” types of food (watermelon rinds, corn shucks, etc.).

Sort results

- Chart 18-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Osage Beach.
- The sample data for all Osage Beach waste sorts are listed on Table 18-7.
- The sort results for Osage Beach are listed on Table 18-8.
- The summary of statistical relevance for the Osage Beach sorts is located on page 292.
- The total for all “other wastes” found during the Osage Beach sorts is on page 292.

All weights are in pounds and volumes are listed in cubic feet.

Comparisons of the Osage Beach’s waste stream to previous studies and other communities can be found in Chapter 24.

OSAGE BEACH RESULTS BY WEIGHT

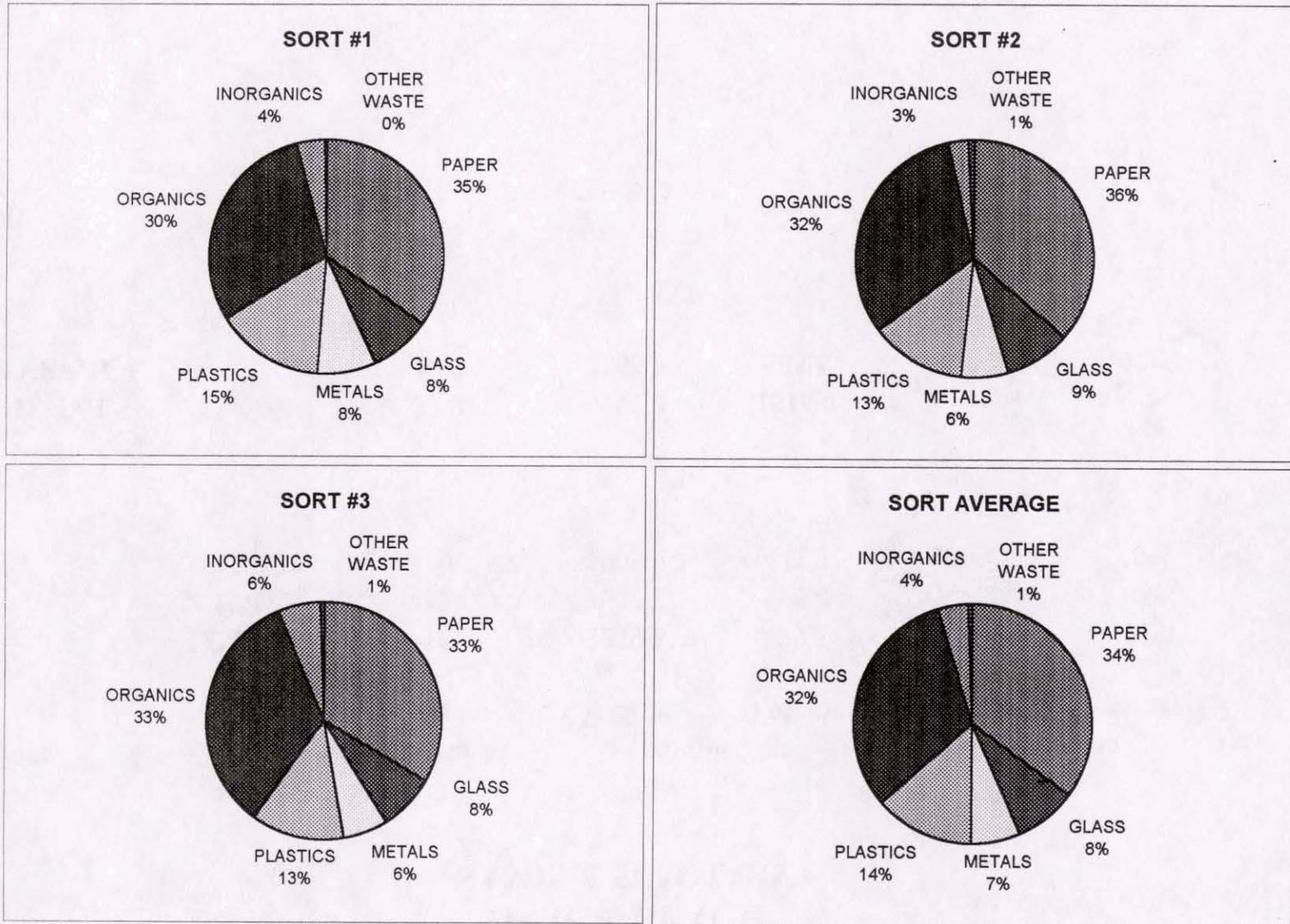


CHART 18-1

OSAGE BEACH SAMPLE SUMMARY

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	2/24-2/25	10	2239.8	479.1	78%	22%
2	5/19-5/20	12	2652.3	595.4	54%	46%
3	9/25-9/27	10	1905.2	442.2	100%	0%
TOTALS		32.0	6797.3	1516.7		
AVERAGE		10.7	2265.8	505.6	77%	23%

TABLE 18-7

CATEGORY	OSAGE BEACH						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	6.7%	12.0%	9.4%	14.4%	7.7%	12.0%	8.1%	12.9%
Newsprint	6.2%	5.9%	5.8%	5.2%	8.3%	5.8%	6.7%	5.6%
Magazines	3.6%	1.8%	3.4%	1.7%	3.6%	1.1%	3.5%	1.5%
High Grade	3.0%	2.8%	6.7%	4.6%	2.9%	3.9%	4.4%	3.9%
Mixed	15.3%	18.1%	11.2%	13.0%	10.8%	14.0%	12.2%	14.8%
PAPER TOTALS	34.8%	40.6%	36.4%	38.8%	33.4%	36.8%	35.0%	38.7%
Clear	4.6%	2.0%	4.6%	1.5%	4.6%	1.5%	4.6%	1.6%
Brown	1.9%	0.9%	3.3%	1.2%	1.4%	0.5%	2.3%	0.9%
Green	0.8%	0.2%	0.7%	0.2%	1.3%	0.4%	1.0%	0.3%
Other	0.9%	0.3%	0.3%	0.2%	0.4%	0.2%	0.5%	0.2%
GLASS TOTALS	8.3%	3.4%	8.9%	3.0%	7.8%	2.6%	8.4%	3.0%
Alum. Cans	2.0%	2.9%	2.1%	4.8%	1.5%	3.9%	1.9%	4.0%
Other Alum	1.0%	0.9%	0.6%	0.8%	0.5%	0.8%	0.6%	0.8%
Non ferrous	0.4%	0.2%	0.4%	0.4%	0.0%	0.0%	0.3%	0.2%
Food Cans	3.3%	2.5%	2.3%	2.1%	3.2%	3.3%	2.8%	2.6%
Ferrous	1.3%	0.9%	0.9%	0.6%	0.9%	0.6%	1.0%	0.7%
Oil Filters	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
METAL TOTALS	8.2%	7.4%	6.2%	8.7%	6.1%	8.6%	6.7%	8.3%
PET # 1	1.9%	2.9%	1.1%	2.8%	1.6%	4.7%	1.5%	3.4%
HDPE # 2	2.1%	4.5%	1.6%	4.1%	2.1%	6.8%	1.9%	5.1%
Film	3.8%	10.1%	3.0%	9.3%	3.7%	9.9%	3.4%	9.7%
Other Plastic	7.0%	13.1%	7.4%	14.6%	5.4%	12.8%	6.6%	13.6%
PLASTIC TOTALS	14.8%	30.6%	13.1%	30.8%	12.8%	34.3%	13.5%	31.8%
Food Waste	21.6%	9.8%	17.8%	7.9%	22.7%	7.4%	20.5%	8.3%
Wood Waste	0.5%	0.2%	1.1%	0.7%	0.7%	0.3%	0.8%	0.4%
Textiles	3.1%	2.7%	4.7%	3.4%	2.3%	2.9%	3.5%	3.0%
Diapers	2.0%	0.6%	4.2%	1.8%	4.5%	2.5%	3.7%	1.7%
Other Organics	2.5%	2.6%	4.0%	3.0%	3.5%	2.0%	3.4%	2.6%
ORGANIC TOTALS	29.7%	15.9%	31.7%	16.8%	33.8%	15.2%	31.8%	16.0%
Fines	2.2%	1.4%	2.1%	1.4%	5.0%	2.1%	3.1%	1.6%
Other Inorganics	1.7%	0.6%	0.6%	0.3%	0.7%	0.3%	0.9%	0.4%
INORGANIC TOTALS	3.9%	2.0%	2.7%	1.7%	5.7%	2.4%	4.0%	2.0%
OTHER WASTE	0.4%	0.1%	0.9%	0.2%	0.6%	0.4%	0.6%	0.2%
SORT TOTALS	100%							

TABLE 18-8

Osage Beach Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	923,076
Total Sample Weight (lbs)	6797.8
Significance Test Results	.000
Number of Samples Collected	32
Mean Sample (lbs) and Confidence Interval (95%)	211.07 (+/-) 16.45

Osage Beach "Other Waste" Summary			
Over-the-counter Medication (OTC)	8	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	3	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	21	Gardening/Yard Care Products	2
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	17
Syringes	22	Alkaline Batteries	62
Hardware/Shop Products	11	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	5		
Miscellaneous items: 1 bottle of charcoal starter, 1 fire extinguisher, 1 bottle of leather dye, 2 butane lighters.			
Total Weight (lb): 43.7			
Total Volume (cubic ft.): 2.4			