



Waste Audit Report  
For Co-Sentry/Midlands Data Center  
Audits conducted May and June 2013  
Assessors: Carrie Hakenkamp with assistance from Brice Miller

### **OVERVIEW**

WasteCap Nebraska was contracted to conduct three separate waste sort events as required to complete LEED 2009 for Existing Building: Operations and Maintenance MR CREDIT 6: SOLID WASTE MANAGEMENT WASTE STREAM AUDIT. The facility is an 88,200 gsf data center that operates 24-hours per day, 7-days per week. The building utilizes two collection containers: a 6-cubic yard container for trash and a 10-cubic-yard container for recycling. Each container is collected once per week and prior to the audits were estimated to be 75% full at the time of collection. Waste types and volumes fluctuate greatly depending on customer needs at the time. Although the Data Center had a very-well established recycling program, there were new opportunities found as a result of the audits. For the purposes of reporting the LEED MR Credit 6, the sorting event data from 6/11/13 is being utilized. This sort seemed to best represent a typical week for the Data Center and also included the results of some employee education following other sorts.

Midlands Data Center representative Scott Capps worked with WasteCap on the project. Mr. Capps requested that the service provider hold waste and recycling collection services until Wednesdays during the sort weeks to ensure that there was one week's worth of waste to be sorted each time. There was a misunderstanding with the service provider who collected the materials prior to the sorts. Because of this, the initial sort events did not have a full week's worth of waste and were likely not typical of an average week's worth of trash and recycling.

### **PROCESS**

The process included a pre-assessment visit and three sort visits. The pre-assessment visit is utilized to determine the scope of the project, amount of time needed to sort, complexity of materials and to gain an understanding of the overall waste management process at the facility. WasteCap was scheduled to perform three waste sort events to sort, quantify and weigh all waste and recyclables. The sorting events were scheduled for May 21, May 28, and June 4, 2013. The May 28<sup>th</sup> sort was cancelled due to the trash and recycling service running just prior to the sort. A final sort was performed on June 11, 2013.

WasteCap Nebraska utilized student volunteers from the UNO Green Basis student organization to assist with the sorts. For each sort, Clear Stream containers with 20 and 30 gallon trash bags were utilized to sort, weigh and measure materials from both the trash and recycling containers. Each material was weighed with a hand scale or floor scale to determine weight. Volume was estimated by the size and fullness of each bag. Cardboard volume was estimated by the fullness of the recycling container or was placed into a 30-gallon waste container to be measured. Each material was itemized and recorded with materials separated by the container (trash or recycling) in which the material was originally disposed by employees or the janitorial service. The information was recorded in a spreadsheet and recycling percentages by weight and volume were determined. Observations and recycling recommendations were also noted. For any materials that were questionable regarding recyclability, photos were taken and samples were taken to recyclers for determination. Recyclable items were included in the report with recommendations and photos for clarity of the recommendation. The photos will then be available for future development of educational materials for an improved recycling program.



Weighing plastic film

### **PRE-ASSESSMENT VISIT**

At the pre-assessment site visit, it was noted that the majority of trash is electronics packaging from data center clients. Each of the cubicles and offices has their own trash container and recycling containers are located in common areas. Both trash and recycling services are provided on the interior by an outsourced janitorial service who, deposit waste and recycling into the two outside containers near the dock area. Because the majority of the building is the data center, which does not allow food or drink, the full waste sort audit was performed for the entire building by evaluating and sorting materials in the waste and recycling dumpsters off the back dock rather than by specific areas within the building.



Packaging materials in dock area

Waste currently being landfilled included various types of plastic film, bubble-wrap and other plastic packaging, including a compressed plastic that often arrives as packaging that can, at times, be a large volume. Based on the initial visit, it was estimated that 4.5 cubic yards of cardboard (with some other recyclables) is collected on a weekly basis. Using national estimates, flattened cardboard weighs about 100 pounds per cubic yard. Trash mainly contained various plastic packaging and bathroom/kitchen waste. Plastic film weighs about 85 pounds per cubic yard loose, and the compressed plastic is estimated to weigh about 60 pounds per cubic yard. Bathroom waste is going to be estimated initially at 25 pounds per cubic yard. Actual weights of all the materials were recorded as part of the audit process. Initial estimates are only used for comparisons.

In the pre-assessment visit, Ms. Hakenkamp met with Mr. Capps and Sarah Gudeman from Morrissey Engineering to prepare for the audit. During this visit, Ms. Hakenkamp made a number of recommendations for improving the recycling program but advised Mr. Capps to not put these recommendations in place until after the baseline audit had been performed. One recommendation was to provide all employees a recycling bin at their workspace to increase the convenience for employees to get to recycling bins. The second recommendation was to collect all plastic film from packaging in a plastic bag for the recycler. During that visit, Ms. Hakenkamp also took a sample of the compressed plastic packaging materials and delivered it to Firststar Recycling to determine recyclability. It was determined to be a Low-Density Poly-Ethylene (LDPE #4) plastic that could have some demand if there is a large enough volume (usually truck-load quantities) to warrant the purchase of shredding or densifying equipment. This will require the recycler identifying other businesses with the same product to produce enough volume for recycling.

### **RESULTS OF INDIVIDUAL SORTS**

Specific Information regarding weights and volumes can be found in the attached charts.

#### **Sort 1: 5/21/13**

The first sort was performed on May 21, 2013. At this point, employees had not been instructed about the waste sort and any potential changes to the program. It appeared that the recycling bin had just been emptied that day since there were very little materials in the recycling container. There was a total of 105 pounds of combined trash and recycling materials, including just two (2) pounds of cardboard in the recycling bin.

Once the materials had been sorted, it was determined that only 37.5 pounds of the material disposed as trash was non-recyclable trash. Other than trash, the largest material by weight in this sort was mixed paper (21%) and the largest material by volume was various types of plastic film (100 gallons).



**Miscellaneous metals  
from electronics**



**Recyclables Found in the Trash**

There was a considerable amount of food packaging in the form of plastic bottles, plastic food containers and other food packaging materials. Non-recyclable trash was primarily food waste and paper towel waste.

This particular sort did not have any of the formed LDPE packaging but did have about 15 pounds of mixed metal waste from the electronics. Samples of the metals were taken to a recycler, and if properly sorted, were determined to be acceptable for recycling.

Scott Capps was verbally informed about the results and shown the amount of materials that could have been recycled. All recyclables were placed in the recycling container for later pickup by the service provider.

Sort 5/28/13: Sort numbers from this date were not utilized since the trash and recycling dumpsters had been emptied just an hour prior to the scheduled sort.

Sort 2: 6/4/13

The second sort was performed on June 4, 2013. This sort showed a greater amount of recycling than the previous sort. Mr. Capps noted that he had also ordered several extra containers to ensure that all employees had a desk-side recycling container. These had not yet arrived. This sort yielded a 97.9% recycling rate by weight for cardboard and a 64% recycling rate by weight for plastic film. Increases in recycling were also noted for plastic food packaging and aluminum cans.



Plastic packaging that can be recycled 2

There were two glass bottles found in the recycling container, however the current co-mingled recycling system does not allow for glass recycling. Photos were taken of various types of plastic film that could be added to the recycling. Paper should be removed (see photo above) and the plastic film packaging should be collected in a 30-gallon container with a clear trash



Plastic packaging that can be recycled 1

liner. The liner should be secured and placed in the recycling container for easy identification at the recycling center. The formed LDPE packaging in this sort was connected to cardboard and any educational materials should make note that cardboard should be separated from the plastic for recycling.

Also noted during this sort was that a lot of the recyclables were in plastic bags. All recyclables, aside from plastic film

packaging should be placed in the recycling container free of bags that will cause problems with the processing equipment. You can either not put liners in the desk-side containers or instruct janitorial staff to not include the liners in the recycling containers. Since the majority of the cardboard weighed in this sort was uniform in size and shape, a representative sample was weighed and adjusted based on the total amount of cardboard recycled. Volume of the cardboard was estimated by the percent that the recycling container was full.

One final note from this sort was that we found lot of wet waste in the form of disposable coffee mugs and lots of bathroom paper towels. Recommendations to reduce or eliminate these waste streams would to be research efficient hand dryers for the bathrooms or to utilize reusable, laundered wash cloths rather than paper towels in each restroom. Each employee could have their own cloth or you can provide a number of cloths that are just laundered on a regular basis. Our office uses a towel rack in the bathroom and



Cardboard weighed and measured

each employee has a spot for their own towel or cloth. Provide all employees with a reusable mug for their coffee will greatly reduce paper cup disposal. Since there is a dishwasher available, we recommend that Midlands Data Center provide both a hot and cold cup for beverages to avoid purchasing disposable cups. Have a few extra cups on-hand for visitors.

### Sort 3: 6/11/13

This final sort showed great improvements in recycling. Delineation was made between “Data Center” plastic (mostly packaging) and food waste packaging to show that the Data Center waste is being fully recycled where employee desk-side waste and breakroom waste could still use some more education and convenience. Cardboard reached nearly 100% recycling and all plastic recovered from the Data Center reached 100% recycling, with the exception of the formed LDPE packaging which is still not being accepted by the recycler. Plastic film recycling reached 74.3% and aluminum (58.8% recycled), and plastic bottle/food packaging (54.5% recycling) recycling rates also increased significantly over past sorts.

Overall, the recycling seems to have improved dramatically from the first pre-assessment visit where the majority of waste in the waste container was recyclable materials. Some education and continued increase of convenience will assist with reaching even higher recycling rates.

## **RECOMMENDATIONS**

1. Make recycling as convenient as possible by providing desk-side containers and the right size and type of containers for the specific waste stream and area of generation
2. Use educational materials incorporating photos to help employees understand what can be recycled and how to collect those materials for recycling
3. Continue to collect all plastic film packaging for recycling. Paper should be removed from the packaging (zip-closed bags, etc) and the plastic film packaging should be collected in a 30-gallon container with a clear trash liner. The liner should be secured and placed in the recycling container for easy identification at the recycling center.
4. Metals generated in the Data Center should be sorted by type (aluminum, steel, others) into containers and taken to a metal recycler or an electronics recycler for recycling. The recycler can identify the best sorting for maximum payment.
5. Plastic food packaging should be rinsed and included with recycling. The most frequent plastics noted included yogurt cups, plastic soda bottles and frozen meal trays. In common areas such as the break room or cubicle areas, provide a recycling container with educational materials including photos and descriptions of items that can be recycled.
6. Paper towel waste was one of the largest waste streams by volume going to the landfill. Research energy efficient hand dryers for the bathrooms. To eliminate this waste stream, research efficient hand dryers for the bathrooms or utilize reusable, laundered wash cloths rather than paper towels in each restroom. Each employee could have their own cloth or you can provide a number of cloths that are just laundered on a regular basis. Our office uses a towel rack in the bathroom and each employee has a spot for their own towel or cloth.
7. Provide employees with reusable coffee mugs and cold beverage cups. Paper coffee cups were the second largest waste stream going to the landfill.
8. Work with your suppliers to encourage them to reduce the packaging you are receiving or to limit packaging to only readily recyclable materials.
9. Continue to work with Firststar Recycling to see if a market has been developed for the formed LDPE packaging.

Midlands Data Center Waste Sort Information

Date of Sort	Material	Weight of all material in Trash (pounds)	Weight by material in Recycling Container (pounds)	Total weight of all trash and recycling (pounds)	Percentage of sorted sample of all waste by weight	Percent of the material recycled by Weight	Volume of material in Trash (gallons)	Volume of material in Recycling container (gallons)	Total volume (gallons)	% of sorted sample by Volume (gallons)	% of the material Recycled by volume (gallons)	Notes from sort:
5/21/2013												approximately 64.3% of the waste in the trash could have been recycled with some market research and education
	Cardboard	9	2	11	10.5%	18.2%	40	1	41	13%	2%	
	Plastic bottles/food plastic	10		10	9.5%	0.0%	40		40	13%		
	Aluminum Cans	2		2	1.9%	0.0%	7		7	2%		
	Mixed paper (office, magazines, n	22		22	21.0%	0.0%	10		10	3%		
	Black metal pieces	9		9	8.6%	0.0%			0	0%		
	steel	6		6	5.7%	0.0%			0	0%		
	glass	1		1	1.0%	0.0%			0	0%		
	Plastic film	6.5		6.5	6.2%	0.0%	100		100	31%		
	Trash	37.5		37.5	35.7%	0.0%	120		120	38%		
<b>TOTAL</b>		<b>103</b>	<b>2</b>	<b>105</b>	<b>100.0%</b>	<b>1.9%</b>	<b>317</b>	<b>1</b>	<b>318</b>	<b>100%</b>	<b>0%</b>	

Date of Sort	Material	Weight of all material in Trash (pounds)	Weight by material in Recycling Container (pounds)	Total weight of all trash and recycling (pounds)	Percentage of sorted sample of all waste by weight	Percent of the material recycled by Weight	Volume of material in Trash (gallons)	Volume of material in Recycling container (gallons)	Total volume (gallons)	% of sorted sample by Volume (gallons)	% of the material Recycled by volume (gallons)	Notes from sort:
5/28/2013												Trash and recycling ran just prior to the sort.
	Cardboard			0	0.0%							
	Plastic bottles/food plastic	1		1	16.7%	0.0%						
	Aluminum Cans	1		1	16.7%	0.0%						
	Mixed paper (off, mag, news)	0.5		0.5	8.3%	0.0%						
	Black metal pieces			0	0.0%							
	steel			0	0.0%							
	glass			0	0.0%							
	Plastic film	0.5		0.5	8.3%	0.0%						
	Trash	3		3	50.0%	0.0%						
<b>TOTAL</b>		<b>6</b>	<b>0</b>	<b>6</b>	<b>100.0%</b>	<b>0.0%</b>						



Midlands Data Center Waste Sort Information

<i>Date of Sort</i>	<i>Material</i>	<i>Weight of all material in Trash (pounds)</i>	<i>Weight by material in Recycling Container (pounds)</i>	<i>Total weight of all trash and recycling (pounds)</i>	<i>Percentage of sorted sample of all waste by weight</i>	<i>Percent of the material recycled by Weight</i>	<i>Volume of material in Trash (gallons)</i>	<i>Volume of material in Recycling container (gallons)</i>	<i>Total volume (gallons)</i>	<i>% of sorted sample by Volume (gallons)</i>	<i>% of the material Recycled by volume (gallons)</i>	<i>Notes from sort:</i>
6/4/2013												
	Cardboard	1	45.93	46.93	32.3%	97.9%	5	270	275	52%	98%	
	Plastic bottles/food plastic	3	0.5	3.5	2.4%	14.3%	20	5	25	5%	20%	
	Aluminum Cans	1.5	0.5	2	1.4%	25.0%	10	5	15	3%	33%	
	Mixed paper (off, mag, news)				0.0%		5		5	1%	0%	
	Black metal pieces				0.0%					0%		
	steel				0.0%					0%		
	glass	1	2	3	2.1%	66.7%				0%		
	Plastic film	2.25	4	6.25	4.3%	64.0%	20	40	60	11%	67%	
	Trash	79.65	2	81.65	56.2%		140	10	150	28%	7%	
	Formed LDPE packaging	2		2	1.4%	0.0%	10			0%		
TOTAL		90.4	54.93	145.33	98.6%	37.8%	210	330	530	100%	62%	

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6/11/2013												
	Cardboard	0.85	153.05	153.9	56.0%	99.4%	1	606	607	79%	100%	
	Plastic bottles/food plastic	3.25	3.9	7.15	2.6%	54.5%	10	15	25	3%	60%	
	Aluminum Cans	0.7	1	1.7	0.6%	58.8%	4	5	9	1%	56%	
	Mixed paper (off, mag, news)	2.4	4.2	6.6	2.4%		5	5	10	1%	50%	
	Black metal pieces	31.4		31.4	11.4%		30		30	4%	0%	
	steel			0	0.0%				0	0%		
	glass			0	0.0%				0	0%		
	Plastic film	4.4	12.75	17.15	6.2%	74.3%	30	30	60	8%	50%	
	Trash	21.65		21.65	7.9%	0.0%			0	0%		
	Data Center Plastic		30.7	30.7	11.2%	100.0%			0	0%		
	Formed LDPE packaging	4.4		4.4	1.6%	0.0%	30		30	4%	0%	
TOTAL		69.05	205.6	274.65	100.0%	74.9%	110	661	771	96%	86%	