

# Recycling and Reuse Technology Transfer Center

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**The Black Hawk County Landfill Small Loads Facility - Evaluation of  
how well it functions and what customers bring, through monitoring  
and surveys: BHCHD Intern report to the RRTTC**

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**The Black Hawk County Landfill Small Loads Facility - Evaluation of how well it  
Functions and what Customers bring, through Monitoring and Surveys**

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## Introduction

In this monitoring and survey project, waste brought in and effectiveness of operation of the Small Loads Facility (SLF) at the Black Hawk County Landfill (BHCL) was studied. The SLF is the part of the landfill where people drop off garbage that do not have a hydraulic dump on their vehicle (Those with dumps go straight to the hole). The usefulness of this project is to provide insight on how well things are working at the SLF, and what they could do to improve the facility. The data from this study can also give insight on whether the County needs to reassess recycling and re-use programs, or if they are presently effective. This is an important issue, since there is only so much land for garbage. The BHCL is expected to last at least until 2060 with current waste patterns, but could last longer with more recycling and re-use programs.

## Methods

Before the initial survey was conducted, Gary Wilcox of the Solid Waste Commission was asked what information would be useful to monitor and survey at the SLF. He then sent a fax to the BHCL (Ran by Denver Construction under contract) stating it was okay for me to monitor an survey there, and said what was going to be monitored and surveyed. 10 hours of surveying and monitoring was planned on four days, between Tuesday, April 15th to Friday, April 19th. *Table 1* and *2* show what was surveyed (note: Every category was not monitored and surveyed every day, but split up between the four days). To get the data needed, the loads were monitored, and questions were asked where needed to fill in the survey.

### **Table 1: Monitoring and Survey Master Sheet of Effectiveness of SLF**

- Identification of customer (residential, commercial hauler, construction, or business)?
- Load covering (tarp and enclosed are adequate, tied down and uncovered are inadequate)?
- If cover not adequate, was brochure given by attendant at SLF?
- Were instructions given by attendant at SLF (yes, no, or pointed to where they were suppose to go)?
- Were the instructions followed?
- Was unloading monitored by attendant?
- Was separation of waste accomplished by customer?
- Were traffic signs obeyed by customer?
- Were banned materials properly taken care of?
- Did children and pets stay in vehicle?
- Was there any multiple visits in same day by customer (Did not ask, only noted if seen)?

### **Table 2: Monitoring and Survey Master Sheet of Solid Waste Brought by Customers**

- Mixed solid waste (For example, what we normally put in garbage bags at home)
- Batteries (Automobile only)
- Tires
- Shingles
- Glass
- Wood (Non-painted)
- Wood (Painted)

- Plastic
- Metal
- Rock (brick, mortar, stone, etc...)
- Vinyl siding
- Cardboard
- Carpet
- Furniture (couches, chairs, recliners, etc...)
- Appliances (Refrigerators, freezers, stoves, air conditioners, etc...)
- Time spent at landfill unloading by customer
- Anything else deemed noteworthy

## Results

In the course of 10 hours at the landfill, 71 customers were surveyed and monitored. The weather was around 40 to 60 degrees Fahrenheit the four days. Each category in *Tables 3 through 13* below was sampled at least two days, and some three of the four days spent there. The Tables show total sampled under the total column, followed by breakdown of categories and percentages of these categories under the % symbol, rounding to the nearest tenth of a percent.

**Table 3: Traffic Signs Obeyed**

<u>Total</u>	<u>Yes</u>	<u>%</u>	<u>No</u>	<u>%</u>
31	29	93.5	2	6.5

**Table 4: Identification of Customer**

<u>Total</u>	<u>Res</u>	<u>%</u>	<u>Const</u>	<u>%</u>	<u>Com</u>	<u>%</u>	<u>Bus</u>	<u>%</u>
48	25	52.1	16	33.3	5	10.4	2	4.2

**Table 5: Load Covered** (No includes tied and no cover, yes includes enclosed and tarp)

<u>Total</u>	<u>No</u>	<u>%</u>	<u>Yes</u>	<u>%</u>
48	26	54.2	22	45.8

<u>None</u>	<u>%</u>	<u>Encl</u>	<u>%</u>	<u>Tied</u>	<u>%</u>	<u>Tarp</u>	<u>%</u>
17	35.4	14	29.2	9	18.8	8	16.7

\* Encl means garbage was in truck with topper or enclosed area.

\* Tied means that the load was tied down only.

**Table 6: If No Cover, was Brochure Provided**

<u>Total</u>	<u>No</u>	<u>%</u>	<u>Yes</u>	<u>%</u>
26	25	96.2	1	3.8

**Table 7: Were Instructions Provided**

<u>Total</u>	<u>Yes</u>	<u>%</u>	<u>Pntd</u>	<u>%</u>	<u>No</u>	<u>%</u>
31	20	64.5	6	19.4	5	6.2

\* Pntd means that the SLF attendant pointed from skid loader where to go.

**Table 8: Were Instructions Followed**

<u>Total</u>	<u>Yes</u>	<u>%</u>	<u>No</u>	<u>%</u>
26	26	100	0	0

\* Did not include those that were not given instructions.

**Table 9: Unloading Monitored by SLF attendant**

<u>Total</u>	<u>Yes</u>	<u>%</u>	<u>No</u>	<u>%</u>	<u>Srt of</u>	<u>%</u>
30	19	63.3	8	26.7	3	10

\* Srt of means the attendant did not fully monitor but did take a glance at customer.

**Table 10: Separation Accomplished by Customer**

<u>Total</u>	<u>Yes</u>	<u>%</u>	<u>No</u>	<u>%</u>	<u>Srt of</u>	<u>%</u>
47	39	83	6	12.8	2	4.3

\* Srt of means the customer did separate waste, but not a very good job.

**Table 11: Frequency of What Customers Brought into the SLF of 40 People Monitored**

\* The # column is how many people of the 40 had the items under waste

<u>Waste</u>	<u>#</u>	<u>% frequency</u>
Wood	23	57.5%
Metal	23	57.5%
Cardboard	14	35%
Plastic	13	32.5%
Carpet	12	30%
Gen. Trash	9	22.5%
Furniture	7	17.5%
Shingles	6	15%
Painted Wood	6	15%
Rock Mat.	6	15%
Tires	4	10%
Glass	4	10%
Vinyl Siding	3	7.5%
Appliances	3	7.5%
Batteries	2	5%

\* Other things of interest brought in but not counted were toilets and rubber materials.

**Table 12: Time Customers Spent at SLF from a Survey of 23 (Rounded to Nearest Minute)**

<u>1 - 10 Min.</u>	<u>%</u>	<u>11-20 Min.</u>	<u>%</u>	<u>21+ Min.</u>	<u>%</u>
12	52.2	8	34.8	3	13

Mean time spent at SLF: 10.3 Minutes

Median time spent at SLF: 7 Minutes

Maximum time spent at SLF: 25 Minutes

Minimum time spent at SLF: 2 Minutes

### **Table 13: Other Relevant Data not in Previous Tables**

- Was three occasions during time spent at SLF where a customer came twice during the same day.
- Children did leave a vehicle on one occasion, and parent was told by attendant to keep children by or in the vehicle.
- All dogs stayed in vehicles.
- A vehicle battery on one occasion and paint cans on another occasion (Do not know if there was anything in the cans) were seen thrown into the general waste bins.

### **Discussion**

#### What worked well at the SLF.

From looking at the tables, there is not too many problems with traffic violations, instructions being followed, separation of materials brought in, and dogs and children leaving vehicles. The only traffic violations monitored was compliance with the one way through the SLF, and therefore complete conclusions about traffic violations in the landfill cannot be made. Speeding was not monitored, but no customer was seen driving in a way that would cause harm or an accident. Separation of waste was at 83%, which is pretty good. When people were told directions, they followed them.

#### What worked okay at the SLF.

Categories that were fair were providing instructions and monitoring loads, both of which the attendant did a majority of the time. Monitoring loads and providing instructions every time when possible would increase the percentage on the category of separation accomplished by customer closer to 100%.

#### What needs improved at the SLF.

Categories that need work are covering loads, providing brochures to those with uncovered loads, and watching for hazardous materials thrown into garbage. The attendant only handed out 1 brochure to those with uncovered loads. Considering how much garbage can blow off a load, this is important. Also, hazardous waste does not belong at the landfill. The attendant did not see the battery and paint cans thrown into the general garbage, but might have been prevented if monitoring was near 100%. It must be noted that even though 83% of the customers separated correctly, 17% did not put waste in the right place. I was surprised at times to see people throw stuff like tree brush and metal, into the general garbage bins.

#### Breakdown of numbers.

A breakdown of some of the numbers shows that half of the people that come to the SLF are residents. Residents and construction companies together comprise over 85% of the visits to the SLF. They should be the main targets for reuse and recycling projects. Other information not yet mentioned is time spent at the landfill. From the survey, it looks as if most people are likely gone in less than a half an hour. No one I monitored was there longer than 25 minutes. As far as multiple visits, conclusive data would require much more than 10 hours of monitoring at the SLF.

In trying to find relations between loads covered, separation accomplished, and the identity of the customer, I compared the surveys of each where overlap of surveys were taken. I did not see a conclusive indication that any category of customers did not separate their garbage or have an uncovered load any more than the other. Part of the problem in doing this was a lack

of time to have a larger customer sample.

The limited data available, though, shows residents as more problematic than construction companies. Residential SLF customers had their loads covered 40% of the time and successfully separated their waste 75% of the time. Construction companies had their loads covered 56.7% of the time and successfully separated their waste 86.7% of the time. Residents were likely lower since there is a higher chance it was their first time there, and did not know the rules. Commercial haulers and businesses did not have enough samples to make conclusive statements on loads cover and separation of waste.

As far as what was brought to the landfill, wood, metal, cardboard, plastic, and carpet were in the customers loads at least 30% of the time. Since metal is recycled, it will not end up in the landfill and take up precious space. The rest, however, could be recycled (Carpet may be a problem). Currently, it is cheaper to throw away these products than to recycle them, so nothing will likely be done. In the future, though, recycling will have to start since there is only so much land for landfills and the production of these raw materials degrades the environment in the long term.

Not all the garbage looked useless that was thrown away. Some of the things thrown into the bins looked like they could have been taken to good will or sold at a garage sale. I saw some furniture, and lots of toys that could have been reused. Ironically, I did see one re-use store that was dumping off material they probably could not sell. So eventually, material that cannot be reused or recycled must be land filled.

## **Conclusion**

Even though the time spent is little and sample number of customers small, two conclusions can be made from the data. First, The SLF is working relatively well, but could improve on things like covering loads and monitoring. Second, a lot of the material taken to the landfill could be recycled, which would increase the life of the landfill. To improve on these two things will require action from Denver Construction and pressure from Black Hawk County, if they want to increase the life of their landfill.