

**FINAL REPORT on the
Co-collection Of Household Source Separated
Organics In Biodegradable Bags and Household
MSW In A Single Truck**

Participants:

**North River Hills Development
City of Burnsville
Dakota County
Waste Management
NRG Processing Solutions/SET**

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**Solid Waste Management Coordinating Board
City of Burnsville
Dakota County**

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Purpose

The Regional/Dakota County Solid Waste Master Plan (1998 – 2017) identifies the region’s policy that mixed-municipal solid waste (MSW) not reduced or recycled be processed to the extent possible.

In June 2001, the Solid Waste Management Coordinating Board (SWMCB) sponsored an evaluation of solid waste management in the regional area through a Citizen’s Jury. The Citizens’ Jury recommended that 19% of the Metro Area’s integrated solid waste management goal be achieved through source separated organics composting (SSOC).

This pilot project addressed SWMCB’s “Case Study #2: Collection in a single truck, mixed load using compostable bags.” Known barriers to residential organics separation include changing generator habits and the costs and operation of collection and transportation. Can standard hauling trucks be used or does organics collection require special or modified trucks? Will a co-collected stream (compostable bags with organics and MSW) cause bag breakage and negatively impact the amount of organics or require further separation at the compost facility? Can marketable compost be produced from SSOM co-collected with MSW?

The goal of the Burnsville Project was to design and implement a successful system for commingled collection of organic materials from residences that is transferable to other neighborhoods.

Project Goals

1. Calculate the effect of a co-mingled collection program on the amount of organics recovered and on the average amount of materials collected.
2. Compare the effectiveness of a co-mingled collection program with degradable bags to the Wayzata program where SSOM is collected separately from MSW in carts (tons of organics recovered per household).
3. Reduce the amount of waste going to landfills.
4. Increase the amount of SSOM that is recovered, composted and marketed from the residential sector.
5. Determine the residential interest in separating organics and educating residents on source separation of organics.
6. Implement a readily transferable system for co-mingled collection of organic materials.

7. Identify further opportunities, barriers, and/or challenges to instituting permanent curbside programs for the separation, collection and composting of organic materials.

Project Description

Project Timeline

	2002
Focus Group.....	June 26
Preprogram Survey.....	August
Brochure (with the start date of the program and the Kickoff Event).....	September
Delivery of Bags.....	Sept. 28/29
Neighborhood Meeting/Kick-off.....	October 1
Collection of Organics Begun.....	October 7
	2003
Magnet mailed.....	January
Phone survey.....	March
Last collection.....	March 31
Mailed Evaluation card.....	April
“Free Compost” coupon mailed to all residents.....	April
Final Report Submitted to SWMCB.....	August

Participating Neighborhood

The City of Burnsville identified and worked with residents of the North River Hills Neighborhood to collect source separated organic materials (SSOM) in identifiable compostable bags. North River Hills was chosen because of the neighborhood association's interest in recycling and because the major portion of the neighborhood is WMI customers.

Education of Participants

The education program included a focus group, 2 mailed surveys, phone survey, kick-off event, and educational materials including a brochure, a flyer and a refrigerator magnet. Examples of promotional materials can be found in Tab A.

Pilot project participants received educational material to inform them of the benefits of organic composting, the acceptable materials for collection and to promote participation. A focus group prior to program implementation was conducted with residents in the pilot project area to gain information regarding the barriers to participation and suggestions for educational strategies. Surveys were sent to project participants to find out more information on general attitudes toward and understanding of composting in general, SSOC specifically, and other pertinent information. A Kick-off event was held prior to the start of the project.

Focus Group

The Focus Group took place on the evening of June 26, 2002 at the City of Burnsville Maintenance Facility. Box lunches were provided along with beverages. Ten residents from the pilot project area attended the session. A Focus Group Discussion Guide was developed and Ann Brovold from Dakota County facilitated the focus group. Sue Bast and Tara Roffler from City of Burnsville were also in attendance.

The objective: To determine if residents would participate in a curbside collection of organics program and what types of educational tools would be effective to promote participation in the program.

The results: All participants felt the organics collection program was valuable and they would participate. Most of the participants did not feel it would take much additional time or effort. However, collection of food scraps seemed to be problematic for some of the participants. Some participants felt it was more convenient to use the garbage disposal for food scraps and others preferred to have a kitchen container with a

plastic bag liner so that it could be easily emptied on a regular basis. In most cases, the male head of the household took the garbage cart to the end of the driveway, but it was the female head of household that was responsible for the recycling collection and sorting. When asked if the program were to be made permanent would they pay a minimal fee for the biodegradable bags, all participants said yes, if it was convenient to purchase the bags (most wanted a year supply upfront – added to their garbage bill - and dropped off by their hauler). The group was shown different versions for a cover for a brochure. After some discussion the group agreed that “Beyond Recycling” worked best.

Preprogram Survey

AGE

<u>Under 30</u>	<u>30-44</u>	<u>45-62</u>	<u>over 62</u>
2	46	65	63

People in the family

<u>One</u>	<u>two</u>	<u>three</u>	<u>four</u>	<u>five</u>	<u>six/more</u>
19	76	17	33	16	15

Use backyard Composting Bin

<u>Yes</u>	<u>No</u>
42	132

Ever Use Composted Material?

<u>Yes</u>	<u>No</u>
88	87

How much do you feel you know about composting

	<u>fair</u>				
<u>a lot</u>	<u>amount</u>	<u>some</u>	<u>little</u>	<u>nothing</u>	
9	44	73	49	4	

Interested in Learning more about the composting process?

<u>Yes</u>	<u>No</u>
94	77

Interested in touring a composting facility?

<u>Yes</u>	<u>No</u>
50	122

Currently throw out food scraps?

<u>Yes</u>	<u>No</u>
122	51

Currently Use garbage disposal for disposing of food scraps?

<u>Yes</u>	<u>No</u>
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142

32

Where is your garbage cart located

Inside garage	115
Outside garage	60
Other	0

Have recycling bags/containers in your kitchen?

<u>Yes</u>	<u>No</u>
78	92

Concerned about the amount of garbage being sent to landfills?

<u>Yes</u>	<u>No</u>
158	14

Is organic separation and collection a good way to recycle more waste?

<u>Yes</u>	<u>No</u>
137	18

Would you be interested in participating in the organics separation/collection pilot project?

<u>Definitely</u>	<u>Maybe</u>	<u>No</u>
59	74	42

Kick Off Event

The Kick-Off Event took place on October 1, 2002 at Sioux Trail Elementary School at 7:00 PM. Approximately 75 residents attended the event and received a free kitchen container and liners.

Sue Bast from the City of Burnsville briefly described the Pilot Project and the reasons why the City of Burnsville was interested in this composting program. Kevin Tritz, NRG Processing Solutions, talked about the interest that the State of Minnesota has in composting as a solid waste management tool, the composting process, and the end uses for the compost. He also explained what to put in the organics bag and how to store the unused biodegradable bags. Ron Moening, WMI, explained the organics/garbage collection process (putting the bag of organics and garbage in the same cart and that it will be collected on the regularly scheduled pick-up day – Mondays). Renee Burman, Dakota County, summarized the importance of resource conservation and the County’s involvement in the School District #196 project.

Phone Survey

Decision Resources Ltd was hired to conduct a phone survey at the conclusion of the Project. This survey polled a fully representative sample of 250 residents. The margin of error is +/- 6.3%. The surveys were conducted between March 18th and 26th, 2003. Decision Resources’ Executive Summary is included below. The full report is included in Tab B.

Executive Summary

By any reasonable standard, the Burnsville Organics Collection Pilot Project must be judged an initial success. Although some mis-remembering can occur, almost one-half of the neighborhood residents reported participating at some level. Currently, 29% of the area still participates. To recruit further contributors, the City may need to provide reassurance that the work is not onerous and the time commitment can be justified by the environmental benefits.

The biodegradable bags held up very well. In fact, almost 60% of the participants would purchase them if the project were continued as an on-going service. Even so, a majority reported they continued to use the garbage disposal, primarily for food scraps.

Only 30% received the 2 ½ gallon kitchen container and liners at the Kick-Off event; most found them useful. IN fact, a significant majority of participants who had not received them at the Kick-Off event reported they would like to obtain them.

By almost 4-to-1, respondents favored continuing the program. More to the point, 21% “strongly favored” its continuation, a level greater than the total opposition to this service. Usage and support, then, favor the City of Burnsville offering the Organics Collection Program in the future.

Post Program Survey

There were 175 responses to the survey. Of those that responded, 139 said that they participated in the organics collection project. Of the 31 that did not participate, 11 said that it was too much work, 7 said they did not understand the instructions, 3 did not know about the project and 10 checked “other”. When asked if the program became permanent would they be willing to purchase the biodegradable bags for a minimal cost, 111 said “yes”, 27 said “no”. Most responded that the biodegradable bag were too large, that wastebasket size would be more appropriate. 143 of respondents supported a continuation of the Program at no additional cost. A complete summary of responses can be found in Tab C.

Biodegradable Bags

65-gallon biodegradable bags made of mater-bi material were purchased from Polargruppen for \$0.79 each. NRG PS staff put together a package that

included 30 biodegradable bags, a brochure outlining acceptable materials and a sample bag of finished compost.

One package was delivered by WMI to each of the 889 households 2 days prior to the Kickoff event. Bags were left at the front door or on the end of the driveway.

Source Separation by Residents

Acceptable materials were to be collected in the kitchen and bathroom and transferred to the biodegradable bag. The method of collecting and transferring organic materials from in the kitchens and baths to the biodegradable bag was left up to the resident. One biodegradable bag was to be used each week. Residents were instructed to dispose of this bag in their waste container.

Collection

WMI collected from each household as usual each week. WMI tipped these loads at the NRG PS Processing Facility.

Processing

The NRG Processing Solutions' Empire MSW Processing and Compost Facility (Empire) processed the materials generated by the neighborhood.

The Burnsville loads were processed as follows:

1. WMI tipped loads on the tipping floor.
2. NRG PS staff visually evaluated loads.
3. Biodegradable bags were counted using a hand clicker and removed by hand. The remaining MSW was shipped to the Newport Resource Recovery Facility for further processing into RDF.
4. Biodegradable bags were loaded into the loader bucket and weighed.
5. Organics were ground, then mixed with bulking agent (yard waste or wood chips) and loaded into the compost system.
6. Once the compost process is completed, the compost will be screened, analyzed and marketed.

To ensure consistency in processing and data collection, the same 2 operators processed the loads throughout the project.

Data Collection

Quantitative Data

1. Capital costs

No additional capital costs were incurred.

2. Collection costs

WMI reported that the Program cost 3 extra hours per day or \$270 per week. The additional hours were due to the need to run a second truck to complete collection in the neighborhood. This truck contained only a few tons of material. It was necessary to run the second truck so that all material generated in the Project neighborhood was collected separately from non-Project waste.

3. Any cost savings for the generator

Any cost savings the generator would have realized by processing this material rather than landfilling was negated by the need to run a second truck to complete collection in the neighborhood.

4. Participation Rate (number of households/time)

See table below.

5. Total tons of material collected

See table below.

6. Percentage of SSOM per ton of total material collected

See table below

7. Pounds of SSOM per household per week

See table below.

WEEK	DATE	WMI PICKUP	TONS TIPPED	BAG COUNT	TONS RDF	TONS COMPOSTED	% COMPOSTED	% PARTICIPATION
1	10/07/02	860	16.98	79	16.94	0.04	0.24%	9.19%
2	10/14/02	870	17.99	89	17.94	0.05	0.28%	10.23%
3	10/21/02	873	18.45	81	17.54	0.91	4.93%	9.28%
4	10/28/02	882	17.62	91	15.09	2.53	14.36%	10.32%
5	11/04/02	880	18.5	212	16.46	2.04	11.03%	24.09%
6	11/11/02	876	18.85	81	18.95	?		9.25%
7	11/18/02	873	17.09	101	16.78	0.31	1.81%	11.57%
8	11/25/02	871	16.17	134	15.85	0.32	1.98%	15.38%
9	12/2/02	869	19.95	169	18.13	1.82	9.12%	19.45%
10	12/9/02	873	14.96	137	14.46	0.5	3.34%	15.69%
11	12/16/02	875	15.19	113	14.99	0.2	1.32%	12.91%
12	12/23/02	865	15.14	126	15.03	0.11	0.73%	14.57%
13	12/30/03	879	19.29	109	19.19	2.17	11.25%	12.40%
14	1/6/03	873	18.47	122	18.3	0.17	0.92%	13.97%
15	1/13/03	867	15.62	101	15.51	0.11	0.70%	11.65%
16	1/20/03	873	14.32	125	14.22	0.1	0.70%	14.32%
17	1/27/03	877	14.14	122	14.04	0.1	0.71%	13.91%
18	2/3/03	875	15.56	125	15.51	0.05	0.32%	14.29%
19	2/10/03	864	12.59	130	12.46	0.13	1.03%	15.05%
20	2/17/03	864	13.29	76	13.23	0.06	0.45%	8.80%
21	2/24/03	862	14.46	136	14.27	0.19	1.31%	15.78%
22	3/3/03	866	14.65	102	14.46	0.19	1.30%	11.78%
23	3/10/03	876	13.15	62	13.06	0.09	0.68%	7.08%
24	3/17/03	871	20.7	69	20.61	0.09	0.43%	7.92%
25	3/24/03	865	18.09	92	17.99	0.1	0.55%	10.64%
26	3/31/03	875	16.22	96	16.1	0.12	0.74%	10.97%
TOTALS			427.44	2880.00	417.11	12.50		
AVG/WK		871.31	16.44	110.77	16.04	0.50	2.70%	12.71%

Qualitative Data

1. **Hauler availability and ability to conduct organics collection and transportation.**

WMI was willing and able to conduct organics collection and transport the mixed loads to the Empire Facility. No alteration of the existing collection system was required except that the loads were delivered to Empire instead of the Burnsville landfill.

2. **Type of hauler vehicle or vehicle modification that best suits this separation and collection method.**

No change to the collection vehicle was necessary.

3. **Routine qualitative assessment of the incoming SSOM**

NRG PS staff observed less than 5% contamination of source-separated materials in the biodegradable bags.

4. **Assessment of bag breakage**

Bag breakage was an issue at the Empire Facility. NRG PS staff estimates that 20 -40% of the bags broke as they were manually removed from the rest of the MSW.

Some compostables also spilled out from bags that were not tied closed.

5. **Resident interest and participation in program and tours**

Weekly participation rate held steady throughout the pilot project (refer to data table above). Maximum participation was 24.09%, minimum was 0.24%, with an average weekly participation of 12.71%.

6. **Identification of educational needs, bag preference, and resident likes and dislikes with the program.**

Decision Resources' survey showed that participants thought the biodegradable bags help up well. 58% reported that they held up "very well," while 28% rate their stability as "somewhat well." Only 10% were more critical. 57% also report they would be willing to participate and purchase the biodegradable bags for a minimal cost if the City made the project an ongoing service.

30% of the participants received the 2 ½ gallon kitchen container and liners at the Kick-Off event. 76% of those receiving the container and liners rated them as “very useful” or “somewhat useful.” Among participants not receiving them, 65% expressed an interest in using the container and liners.

Program Out-of-Pocket-Costs

DESCRIPTION	COST	SOURCE OF FUNDING
Educational Materials	\$ 8,394.46	SWMCB
Biodegradable Bags	\$14,509.40	SWMCB
Delivery of Bags	\$ 500.00	SWMCB
Resident Incentives	\$ 960.00 \$ 141.00	SWMCB
Postage for mailing magnets	\$ 1,324.12	SWMCB
Phone Survey	\$ 3,500.00	SWMCB
Postage	\$ 689.60	SWMCB
Postage/Focus Group letter	\$ 329.30	SWMCB
TOTAL	\$29,966.67	

Conclusions and Recommendations

1. **The system of delivering bags to the participants is key.** A number of residents called saying they had not received bags. Some bags that were left outside on the driveway or front stoop were ruined by rain. This may have affected participation negatively. Ideally, bags would be available at retail stores so that the expense and logistical challenges of delivering them would be eliminated.
2. **Colored biodegradable bags will make separation at the processing facility easier.** NRG PS staff had difficulty identifying the biodegradable bags in the waste stream. Colored bags would alleviate this problem.
3. **Drawstring bags may also be advantageous for recovering more organics.**

4. **More organics may have been recoverable with the use of a picking line.** The picking line at the NRG PS facility was not operational at the time of the project. Biodegradable bags were removed by a floor sort.

Project Goals Revisited

1. **Calculate the effect of a co-mingled collection program on the amount of organics recovered and on the average amount of materials collected.**

12.50 tons of organics were recovered and composted that would have been landfilled without the program in place.

2. **Compare the effectiveness of a co-mingled collection program with degradable bags to the Wayzata program where SSOM is collected separately from MSW in carts (tons of organics recovered per household).**

The Wayzata Program did not begin until April 1, 2003. At the time of the writing of this report, comparison data was not available.

3. **Reduce the amount of waste going to landfills.**

Prior to the project, MSW from this neighborhood was landfilled. The program resulted in 12.50 tons being composted and 414.94 tons being processed into energy.

4. **Increase the amount of SSOM that is recovered, composted and marketed from the residential sector.**

A total of 12.50 tons of organics were composted into a usable end product; 2.7% of the total collected on a weekly basis. The percentage recovered in the Burnsville Project is comparable to the amount of recyclables recovered curbside when recycling was first introduced in Minnesota.

In April of 1983, the City of St. Cloud began a small pilot program for the curbside collection of glass, newspaper and aluminum cans for recycling. This initiative was the earliest program of its kind in the State that kept detailed records of the amount of materials collected. Between 1984 and 1988, an average of 3.4% of the waste stream was recycled (for complete data, see Tab D). If the data from these two projects are compared, the infancy of curbside organics collection is reminiscent of the first recycling program. This provides for us, 20 years later, a measuring stick for how well we're doing with organics recovery.

5. Determine the residential interest in separating organics and educating residents on source separation of organics.

Data revealed that there was a core group of households who actively participated in the program. A solid 64% of the participants would favor continuing the Program; 21% of those “strongly favor” its continuation. Only 16% are “opposed,” and 20% were “uncertain.” (Decision Resources’ survey)

6. Implement a readily transferable system for co-mingled collection of organic materials.

This project has demonstrated that a program of source-separation of organics with co-mingled collection can be implemented and does result in organic materials being composted.

7. Identify further opportunities, barriers, and/or challenges to instituting permanent curbside programs for the separation, collection and composting of organic materials.

This program worked well in this neighborhood because the majority of the residences hire WMI for collection. In subscription-based marketplaces, all haulers will need to be willing to participate and work with their customer base.

Education programs must be extensive and on going.

Biodegradable bags need to be available at the larger retail stores so that it is easy and convenient for residents to purchase them.