

Follow the Money!



Full Cost Accounting for Solid Waste Management

September 2021

Agenda

- Full Cost Accounting
- Packets of Information
- Homework
- Work Session
- Volunteers, as time allows

What is Full Cost Accounting?

- A reporting system developed by the US EPA
- A systematic approach for identifying and characterizing the cost of providing solid waste services
- Groups expenses into 4 "Paths"
 - Recycling
 - Waste to Energy (WTE)
 - Compost
 - Landfill



Full Cost Accounting is **NOT**

- An audit
- A strict accounting system
- A time & motion study
- “True Cost” – does not include social, environmental, or health costs.



FCA vs. Cash Flow Accounting

All resources used or committed.

vs.

Current outlays of cash ("the budget")

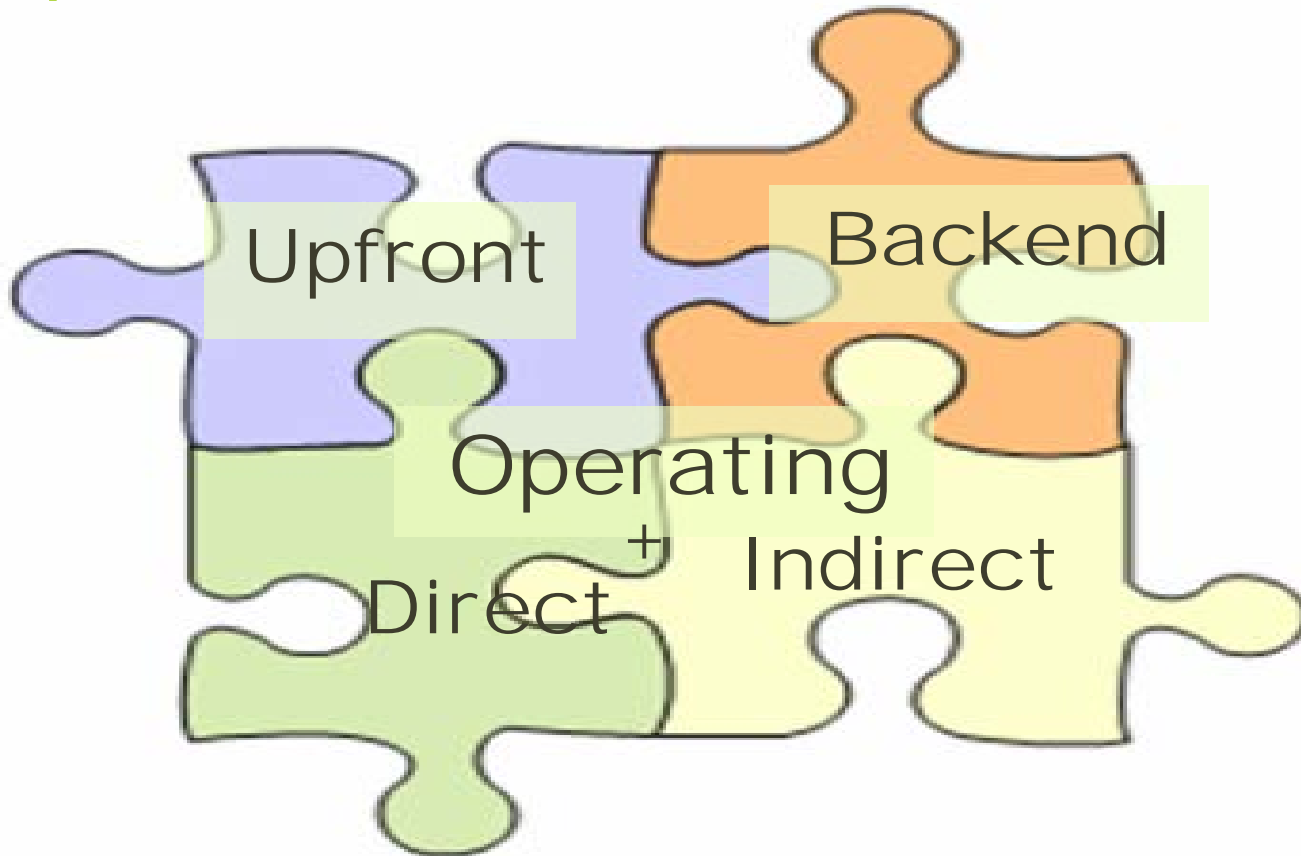
Guiding Documents



Full Cost Accounting for Municipal Solid Waste Management in Florida



Inputs



Outputs

- Net unit cost (\$/ton) for each path
- Pie charts of cost breakdowns
- Average waste generation per person

	Recycle	Compost	W-T-E	Landfill
Total Cost	\$\$\$	\$\$	\$	\$\$\$\$\$
Less Revenue	\$		\$	\$\$\$
Net cost	\$\$	\$\$	0	\$\$
Tons	500	30	10	700
\$/ton	\$/ton	\$/ton	\$/ton	\$/ton

Uses & Benefits

Is Recycling Worth it?



Uses & Benefits of Full Cost Accounting

- Making data-driven decisions
- Financial planning (capital purchases, etc.)
- Setting goals (recycling, waste reduction)
- Setting Pay-As-You-Throw rates
- Setting tipping fees
- Evaluating program changes
- Educating residents
- Negotiating with vendors

Full Cost Accounting in Practice

Mandatory

- Florida
- Indiana
- Georgia
- North Carolina

Voluntary

- Laramer County, CO
- Phoenix, AZ
- Shawnee County, KS
- Houston, TX

NCC Project Status

- 5 towns were studied in 2012-2013

Berlin

Gorham

Littleton

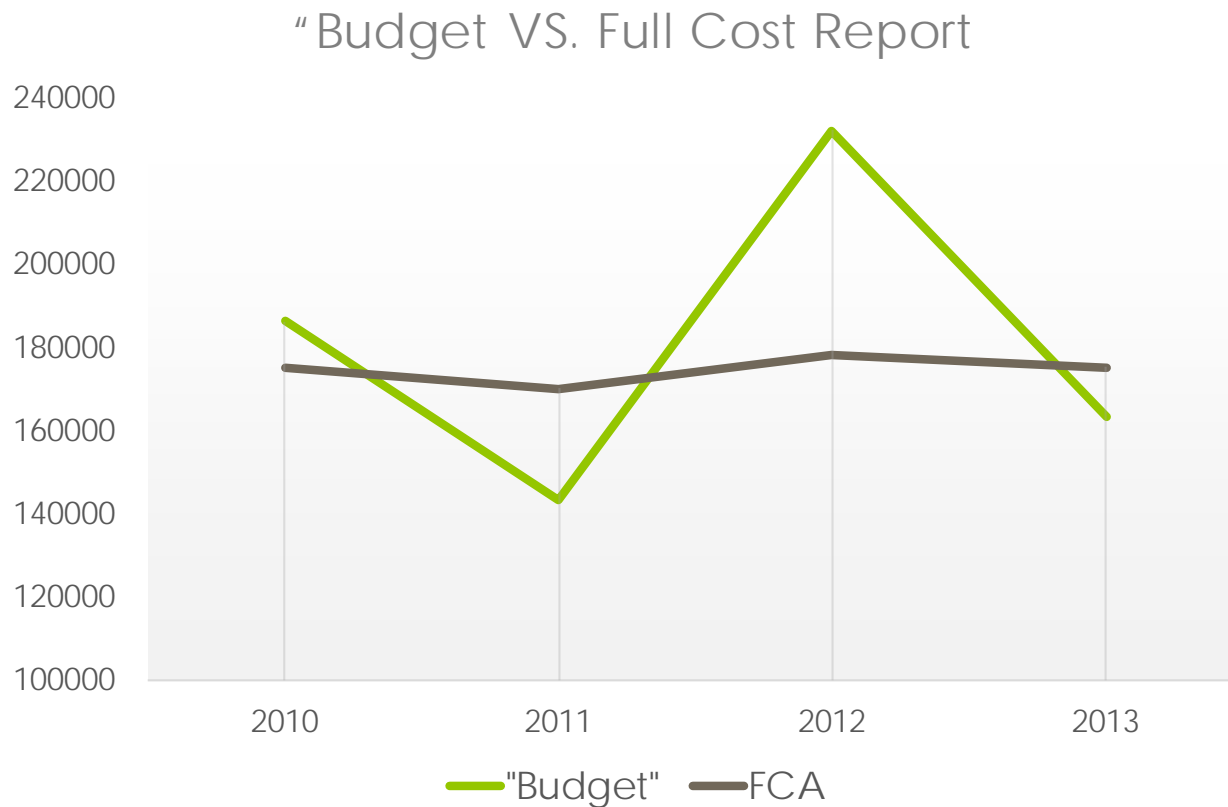
Plymouth

Warren

- 2 more towns were studied in 2014-15,
Carroll, and Lisbon

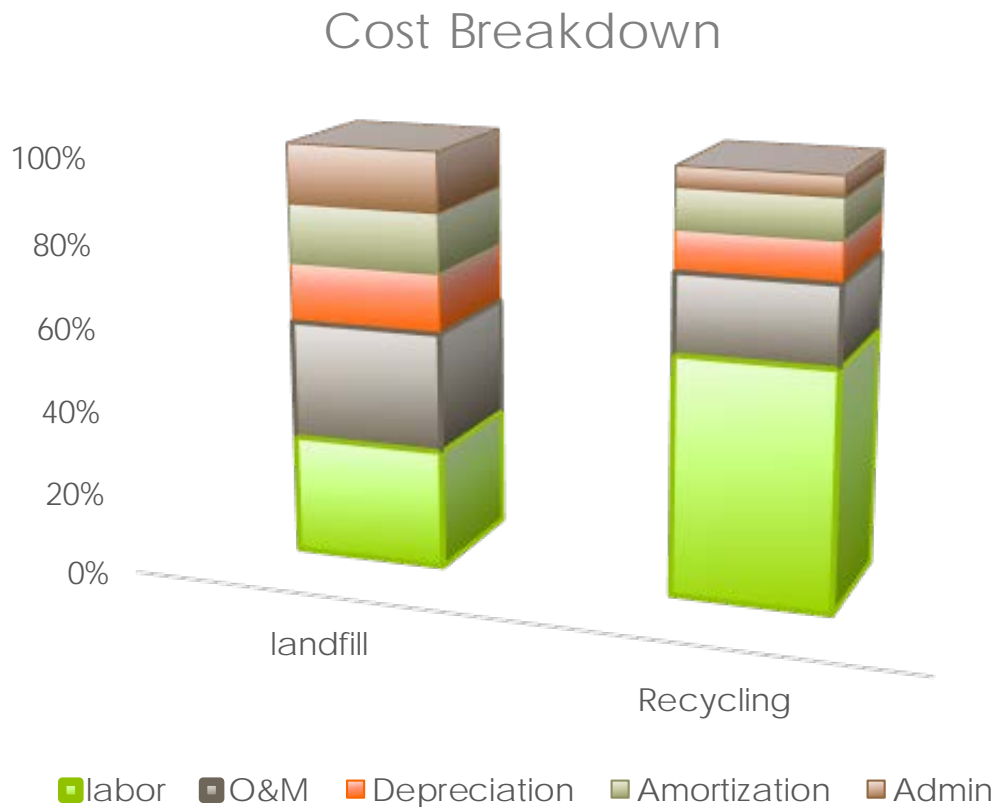
Why do FCA?

- Smooth out the peaks & valleys of expenses over time



Why do FCA?

- Look for areas of inefficiency



FCA for Your Facility

Applying and Inserting Data

Brian Patnoe, Lancaster Transfer Station

The Workbook

GENERAL OPERATIONS AND MAINTENANCE										
Year of Interest:										FORM 2 - Page 1 of 2
Description of Expenditure	Cost Center (if applicable)	Total Annual Cost (\$)	Allocation of Annual O & M Costs by Program Area							
			Landfilling		Waste-to-Energy		Recycling		Composting	
			%	\$	%	\$	%	\$	%	\$
1 Heating fuel										0%
2 Debris										0%
4 Rent										0%
5 Sewer										0%
6 Gasoline										0%
8 Diesel fuel										0%
9 Vehicle maintenance										0%
10 Tire disposal										0%

- Microsoft Excel
- 6 "Forms"
- 16 sheets total plus some scratch sheets
- Automatic totals, summaries, and charts

Inputs

- Annual Facility Report (AFR)
- Supervisor interview
- Expenditure reports
- Capital asset list
- Capital improvement plan
- Revenue reports
- Municipal annual report



				Allocation of Annual O & M Costs by Program Area					
Description of Expenditure		Cost Center (if applicable)	Total Annual Cost (\$)	Landfilling		Waste-to-Energy		Recycling	
				%	\$	%	\$	%	\$
1	Warrant article #15 capital expense		25,936.00	54%	13,876	0%	-	46%	11,931
2	Mileage & training		1,099.00	54%	590	0%	-	46%	593
3	uniforms		1,555.00	54%	832	0%	-	46%	715
4	telephone		984.00	54%	526	0%	-	46%	453
5	Professional services		1,321.00	54%	707	0%	-	46%	608
6	electricity		2,297.00	54%	2,297	0%	-	46%	1,975
7	Heating fuel		-	54%	-	0%	-	46%	-
8	Water & sewer		120.81	54%	65	0%	-	46%	56
9	Buildg. equip, vehi. expen		267.00	54%	131	0%	-	46%	267
10	Dues		4,147.00	54%	2,219	0%	-	46%	1,908
11	supplies		277.00	54%	148	0%	-	46%	127
12	Fuel		2,629.00	54%	1,417	0%	-	46%	1,209
13	Disposal fees	01-813, 07-813	64,719.80	100%	64,720	0%	-	0%	-
14	Disposal fees, Recycling	01-813, 05-813, 06-813	5,131.00	0%	-	0%	-	100%	5,131
15	Hauling Fees	02-813	9,288.00	100%	9,288	0%	-	0%	-
TOTALS			\$ 122,271.61		97,084		-		24,972

6 Main Worksheet Forms

1. Labor (wages & benefits)
2. Operation & maintenance
3. Depreciation of capital items
4. Amortized future costs
5. Indirect/Administrative Costs
6. Summary

Most forms have 2 parts:

1. Compile total costs
2. Assign costs to solid waste paths

16	11	supplies		277.00	54%
17	12	Fuel		2,629.00	54%
18	13	Disposal fees	01-813, 07-813	64,719.80	100%
19	14	Disposal fees, Recycling	04-813, 05-813, 06-813	5,131.00	0%
20	15	Hauling Fees	02-813	9,288.00	100%
21		TOTALS		\$ 122,271.61	
22					
23					
24					

Wages1	Wages2	SandM	SandM_2	Depreciation1	Depreciation2
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Key Considerations

- Separating costs among “Paths”
- Operation & maintenance
- Depreciation
- Amortized future costs
- Indirect Cost allocation

● **GIGO**



Allocating Direct Costs

Method 1. Labor Ratio

Solid Waste Path	Labor hrs per week	Labor Ratio Portion
Landfilling	36.5	42%
Waste-to-Energy	0	0%
Recycling	49	57%
Composting	1	1%
TOTALS	86.5	100%

Method 2. Tonnage Ratio

Solid Waste Path	Annual tonnage	Tonnage Fraction
Landfilling	307	44.8%
Waste-to-Energy	0	0%
Recycling	375	54.7%
Composting	3	0.4%
TOTALS	685	100%

Example; Wages Form – Part 1

	A	B	C	D	E	F	G	H
1	WAGES AND BENEFITS							
2		Year of Interest:	2013					FORM 1 - Page 1 of 2
3		Employee or Group	Description	Total Annual Wages(\$)	Total Annual Benefits(\$)	Total Annual Post-employment	Allocation	Total Annual Wages and Benefits (\$)
4	1	Supervisor	Bill	23,580.54	1,803.91		100%	\$ 25,384.45
5	2	Attendant 1	Eric	25,493.50	1,950.25		100%	\$ 27,443.75
6	3	Attendant 2	John	157.00			100%	\$ 157.00
7	4	combined workers comp			1,066.74		100%	\$ 1,066.74
8	5	combined unemployment			176.77		100%	\$ 176.77

Example; Wages Form – Part 2

	A	B	C	D	E	F	G	H	I	J	K
1	WAGES AND BENEFITS										
2		Year of Interest: <u>2013</u>								FORM 1 - Page 2 of 2	
3			<i>Allocation of Annual Wages and Benefits by Program Area</i>								
4		Employee or Group	Total Annual Wages and Benefits (\$)	Landfilling		Waste-to-Energy		Recycling		Composting	
5				%	\$	%	\$	%	\$	%	\$
6	1	Supervisor	25,384	42%	10,661	0%	-	58%	14,723	0%	-
7	2	Attendant 1	27,444	42%	11,526	0%	-	57%	15,643	1%	274
8	3	Attendant 2	157	42%	66	0%	-	57%	89	1%	2
9	4	combined workers comp	1,067	42%	448	0%	-	57%	608	1%	11
10	5	combined unemployment	177	42%	74	0%	-	57%	101	1%	2

Tricky Inputs



- Admin/Indirect Costs
- Equipment purchases
- Shared Equipment
- Shared Personnel

Tricky Inputs - Administrative

Account Number	Account Name	Current Year Budgeted	Period Expenditures	Current Year Expenditures
FINANCIAL ADMINISTRATION				
01-4150.10-110	FA Administrative Assistant	31949.00	32025.60	32025.60
01-4150.10-111	FA Selectmen's Office Staff	20384.00	16922.50	16922.50
01-4150.10-113	FA Budget Comm Clerk Salary	1.00	0.00	0.00
01-4150.10-114	FA Sel. Off.Overtime	1.00	2793.60	2793.60
01-4150.10-250	FA Tax Map	2500.00	2440.00	2440.00
01-4150.10-260	FA Town Report	2000.00	1868.00	1868.00
01-4150.10-301	FA Auditing	15000.00	14500.00	14500.00
01-4150.10-390	FA Office Equipment	650.00	1313.57	1313.57
01-4150.10-603	FA Office Equip. Maintenance	700.00	506.46	506.46
01-4150.10-604	FA Association Dues	1490.00	2714.40	2714.40
01-4150.10-620	FA Office Supplies	2500.00	2216.68	2216.68
01-4150.10-621	FA Computer Software Support	6000.00	4445.08	4445.08
01-4150.10-622	FA Summit CAMA	901.00	750.00	750.00
01-4150.10-625	FA Postage	1800.00	1215.67	1215.67
01-4150.10-740	FA Telephone	1300.00	1715.03	1715.03

Figuring Admin Costs

Method 1. Personnel Ratio

A	Total number of SW Employees	4.5
B	Number of employees in shared services	10
C	Total number of Municipal Employees	48.1
D	Employee Ratio = A / (C - B)	11.8%

Which one to use?

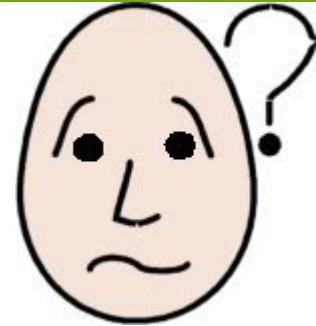
⋮

Pick the LOWER %.

Method 2. Budget Ratio

A	Solid Waste Department Budget	\$ 317,536
B	Budget of Shared Services	\$ 607,705
C	Annual Town/City Budget	\$ 6,981,285
D	Budget Ratio = A / (C - B)	5.0%





More Tricky Inputs

Equipment purchase with CRF

Item	Category/Form	Expense	Revenue
Baler Purchase	#2 - O&M	\$ 40,000	
Use of CRF	#2 - O&M	\$ 20,000	\$ 20,000
\$ into CRF	#2 - O&M	\$ 2,000	
Depreciation	#3 - Deprec.	2,000	
\$ into SRF	#2 - O&M	6,000	8,000
TOTAL		60,000	28,000
NET COST			\$ 30,000

Pop Quiz: Which path do ALL these amounts belong in?

ANSWER: RECYCLING

(Even) More Tricky Inputs, Part 1

Path

Fund: GENERAL FUND

Account Number	Account Name	Current Year Budgeted	Period Expenditures	Current Year Expenditures	Peric Encum
01-4920.00-025	Tr Sta Storage Trailers ✓	12375.00	7875.00	7875.00 ✓	R
01-4920.00-026	NO. CTRY ELDER PROGRAMS-MEALS	350.00	350.00	350.00	
01-4920.00-030	Town Master Plan Update	15000.00	4155.00	4155.00	
01-4920.00-031	LANDFILL CLOSURE WARRANT ART	7432.00	1099.00	1099.00 ✓	L
01-4920.00-032	OFFICE PHOTOCOPIER	0.00	0.00	0.00	
01-4920.00-033	HIGHWAY PLOW TRUCK WARRANT ART	0.00	0.00	0.00	
01-4920.00-035	TOWN HALL ENERGY IMPROVEMENTS	0.00	0.00	0.00	
01-4920.00-036	FD Gear Extractor	0.00	6389.00	6389.00	
01-4920.00-039	COMPUTER TECHNOLOGY	0.00	5932.31	5932.31	
01-4920.00-040	AMBULANCE ART	0.00	0.00	0.00	
01-4920.00-041	WEEKS MED CTR NRTHWDS HMHLTH&H	1167.00	1167.00	1167.00	
01-4920.00-044	TRFR STN BULKY WASTE ✓	20000.00	18970.68	18970.68 ✓	?

(Even) More Tricky Inputs, Part 2

Account Number	Account Name	Current Year Budgeted	Period Expenditures	Current Year Expenditures	Encumbrances	Balance Remaining	Percent Left
01-4920.00-044	TRFR STN BULKY WASTE	20000.00	18970.68	18970.68	0.00	1029.32	5.15

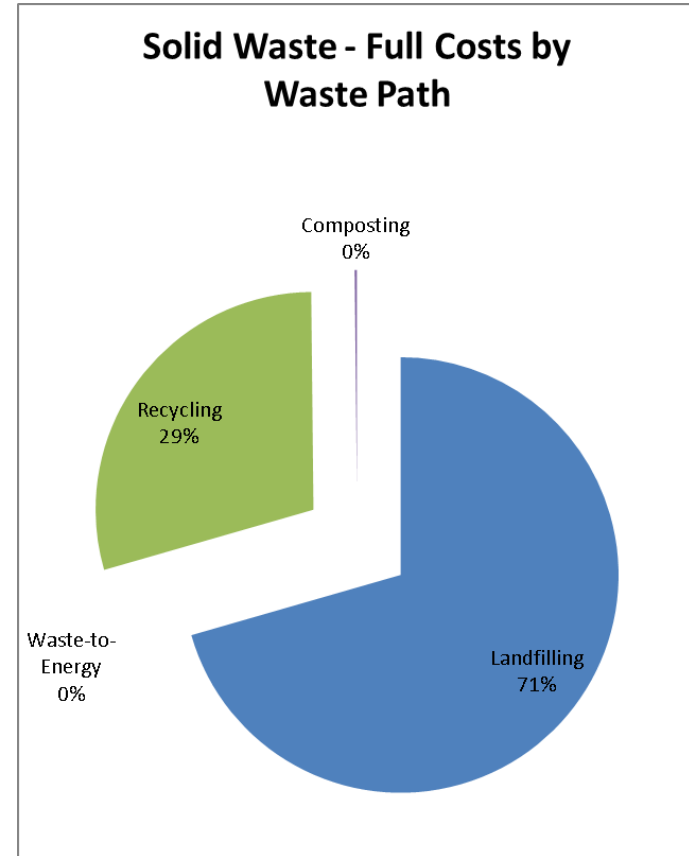
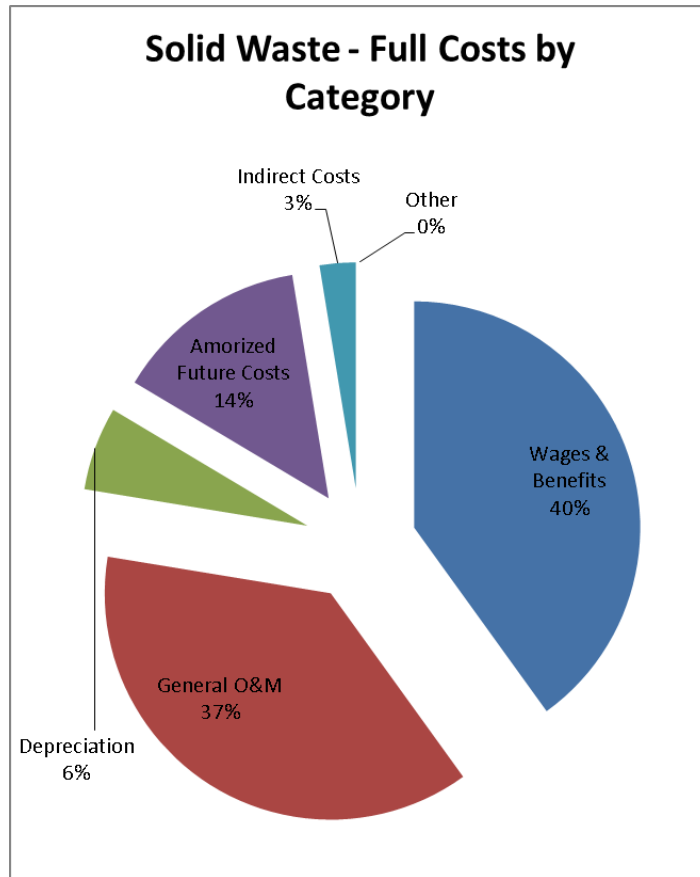
Transaction	Period	Date	Transaction Description	Vnd#	Vendor Name	Document#	Trn Amount
007239-000328	Jan 2013	03/27/13	Budget Allotment - January			BG E 80	20,000.00
Appropriation Total							20,000.00

Transaction	Period	Date	Transaction Description	Vnd#	Vendor Name	Document#	Trn Amount
007090-000003	Jan 2013	01/17/13	1505575	CASELL	CASELLA WASTE MGT., INC.	AP V 025553 VE	108.42
007108-000041	Jan 2013	01/25/13	12325	SC SUP	SC Supply Company, LLC	AP V 025626 VE	40.01
007108-000043	Jan 2013	01/25/13	116901	SPAULD	F.B. SPAULDING CO.	AP V 025628 VE	448.89
007135-000011	Jan 2013	01/31/13	1510164	CASELL	CASELLA WASTE MGT., INC.	AP V 025642 VE	829.97
007152-000004	Feb 2013	02/07/13	226792	HARDWR	Whitefield Hardware & Bldg	AP V 025689 VE	1.50
007152-000005	Feb 2013	02/07/13	226430	HARDWR	Whitefield Hardware & Bldg	AP V 025690 VE	74.85
007152-000006	Feb 2013	02/07/13	226429	HARDWR	Whitefield Hardware & Bldg	AP V 025691 VE	58.14
007152-000007	Feb 2013	02/07/13	226610	HARDWR	Whitefield Hardware & Bldg	AP V 025692 VE	16.45
007152-000008	Feb 2013	02/07/13	226661	HARDWR	Whitefield Hardware & Bldg	AP M 025693 VE	(13.16)
007152-000009	Feb 2013	02/07/13	226642	HARDWR	Whitefield Hardware & Bldg	AP V 025694 VE	5.26
007152-000010	Feb 2013	02/07/13	226678	HARDWR	Whitefield Hardware & Bldg	AP V 025695 VE	3.79
007152-000011	Feb 2013	02/07/13	226572	HARDWR	Whitefield Hardware & Bldg	AP V 025696 VE	3.49
007169-000006	Feb 2013	02/14/13	Office Supply Reimbursement	BILL		AP V 025745 VE	12.49
007181-000007	Feb 2013	02/22/13	1514700	CASELL	CASELLA WASTE MGT., INC.	AP V 025766 VE	113.98
007181-000008	Feb 2013	02/22/13	Office Supplies Reimbursement	BILL		AP V 025767 VE	56.99
007192-000004	Feb 2013	02/28/13	1325303001	STCAT	Staples Credit Plan	AP V 025818 VE	155.65
007192-000019	Feb 2013	02/28/13	29508	NE REC	NORTHEAST RESOURCE RECOVER	AP V 025826 VE	359.03

Outputs, Results & Conclusions

Form #6 - Summary	Total Solid Waste Costs (\$)	Costs by Waste Path			
		Landfilling	Waste-to- Energy	Recycling	Composting
		\$	\$	\$	\$
1 Total Costs	\$ 438,617	\$ 253,367	\$ -	\$ 180,066	\$ 5,185
2 Revenues	114,385	37,996	-	88,070	-
3 Net Costs (line 1- line 2)	324,232	215,371	-	91,996	5,185
4 Tons Processed	1,628	968	-	625	35
5 Net Cost, \$/Ton	\$ 199.21	\$ 222.49	\$ -	\$ 147.29	\$ 148.13
6 Household Units Served	2,047	2,047	2,047	2,047	2,047
7 Net Cost Per Household, \$	\$ 158.39	\$ 105.21	\$ -	\$ 44.94	\$ 2.53

Results & Conclusions



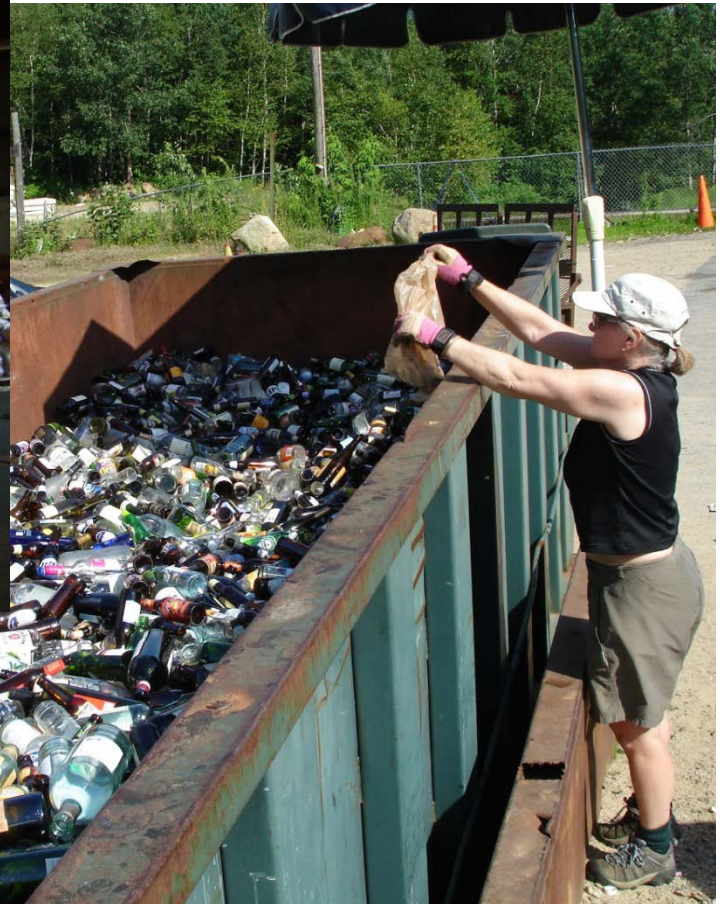
Previous Results

COMPARISON OF SOLID WASTE COSTS (FCA - net after revenue)

Town	Population	Annual Tonnage	Net Cost per Ton for MSW Paths				
			Recycling	Compost**	W-t-E	Landfill	Overall
Charlestown*	5,114	2,351	\$ 70.95	\$ 87.70	-	\$ 104.19	\$ 96.14
Unity*	1,671	159	\$ 144.03	-	-	\$ 80.13	\$ 99.16
Berlin	10,051	5,555	\$ 316.20	-	-	\$ 173.04	\$ 186.35
Gorham	2,848	2,332	\$ 565.19	\$ 239.91	-	\$ 135.96	\$ 209.86
Littleton	5,828	1,807	\$ 61.93	\$ 207.90	-	\$ 123.88	\$ 112.58
Plymouth	6,990	1,628	\$ 147.29	\$ 148.13	-	\$ 222.49	\$ 199.21
Warren	904	749	\$ 53.85	-	-	\$ 39.79	\$ 48.67
AVERAGE COSTS			\$ 194.21	\$ 170.91	n/a	\$ 125.64	\$ 136.00

Contributing Factors

Or this?



This?



Contributing Factors

COMPARISON OF MSW PROGRAM FEATURES

Town	Transfer Station	Curbside Pickup	Pay as You Throw	Active Town Landfill	Permits Required \$	Mandatory Recycling	Bulky Waste Fees
Charlestown*	X				X	X	X
Unity*	X		X	X			X
Berlin		X			X	X	
Gorham	X	X					
Littleton	X		x				
Plymouth	X					X	X
Warren***	X		X				X

Resources

- US EPA –
<http://www.epa.gov/epawaste/conservation/tools/fca/whatis.htm>
- Northeast Recycling Council (NERC) -
www.nerc.org
- Florida Dept. of Environmental Protection
<http://www.dep.state.fl.us/waste/categories/fca/>
- NCC Online Maps
<https://nccouncil.maps.arcgis.com/home/index.html>

Questions?

How to Manage Your Volunteers

Tara Mae Albert, M.S.
SWOT Coordinator, NHDES

Purpose of the SWOT Program

(Env-SW 1601.01)

- Ensure that SW Facility operators are aware of potential adverse environmental impacts of SW Facility operations and the requirements that apply to such operations
- Increase the likelihood that SW Facilities are operated in accordance with applicable requirements
- Reduce the likelihood of accidents or other threats to the health and safety of individuals who work at a facility, volunteer at a facility, or use a facility

Who is Exempt from the SWOT Program?

- Env-Sw 1602.02 exempts the following people from becoming a certified SW Operator
 - Those who are on work release or volunteering as part of uncompensated public service as a parolee
 - Those whose only responsibility is to pick up litter at a facility
 - Those who are employed by or volunteer at an exempt facility as defined in Env-Sw 1603.04
 - Those individuals who volunteer at a solid waste facility, provided provisions are met.

When are Volunteers Exempt?

- Engage only in activities that are essentially non-hazardous, such as providing information to facility users and sorting recyclable materials
- Work under the supervision of a certified operator
- Facility owner provides training and safety equipment for each task to be performed that is adequate to ensure that the purpose of the SWOT Rules is met



So what should YOU do?

Bare minimum requirements and suggestions for managing volunteers in compliance with the regulations

What are Non-Hazardous Activities?



Personal Protective Equipment



- Safety Glasses
- Leather gloves
- Mask
- Vest/Uniform shirt
- Closed toed shoes/boots
- Any other equipment that is required per your safety plan.





- Great place for your volunteers...as long as there are rules!