APPENDIX P

U.S. EPA WARM MODEL OUTPUT

Version 12

Waste Reduction Model (WARM) -- Inputs

Use this worksheet to describe the baseline and alternative MSW management scenarios that you want to compare. The blue shaded areas indicate where you need to enter information.

1. Describe the baseline generation and management for the MSW materials listed below.
If the material is not generated in your community or you do not want to analyze it, leave it blank or enter 0. Make sure that the total quantity generated equals the total quantity managed.

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Generated
Aluminum Cans		291.00		NA	291.0
Aluminum Ingot		-		NA	0.0
Steel Cans		862.00		NA	862.0
Copper Wire		-		NA	0.0
Glass		4,641.00		NA	4641.0
HDPE		1,463.25		NA	1463.3
LDPE	NA	-		NA	0.0
PET		712.00		NA	712.0
LLDPE	NA	-		NA	0.0
PP	NA	-		NA	0.0
PS	NA	-		NA	0.0
PVC	NA	-		NA	0.0
PLA	NA	-			0.0
Corrugated Containers				NA	0.0
Magazines/Third-class Mail				NA	0.0
Newspaper				NA	0.0
Office Paper				NA	0.0
Phonebooks				NA	0.0
Textbooks				NA	0.0
Dimensional Lumber				NA	0.0
Medium-density Fiberboard				NA	0.0
Food Scraps	NA	-			0.0
Yard Trimmings	NA	-			0.0
Grass	NA	-			0.0
Leaves	NA	-			0.0
Branches	NA	-			0.0
Mixed Paper (general)				NA	0.0
Mixed Paper (primarily residential)		-		NA	0.0
Mixed Paper (primarily from offices)		-		NA	0.0
Mixed Metals		10,660.84		NA	10660.8
Mixed Plastics		12,960.23		NA	12960.2
Mixed Recyclables		-		NA	0.0
Mixed Organics	NA	-			0.0
Mixed MSW	NA	19,440.35		NA	19440.3
Carpet		3,344.58		NA	3344.6
Personal Computers		1,881.32		NA	1881.3
Clay Bricks	NA	-	NA	NA	0.0
Concrete [1]		19,649.38	NA	NA	19649.4
Fly Ash [2]		-	NA	NA	0.0
Tires [3]		-		NA	0.0
Asphalt Concrete		209.04	NA	NA	209.0
Asphalt Shingles		4,389.76		NA	4389.8
Drywall			NA	NA	0.0
Fiberglass Insulation	NA	1,045.18	NA	NA	1045.2
Vinyl Flooring	NA	-		NA	0.0
Wood Flooring	NA	-		NA	0.0

2. Describe the alternative management scenario for the MSW materials generated in the baseline.
Any decrease in generation should be entered in the Source Reduction column.
Any increase in generation should be entered in the Source Reduction column as a negative value.
(Make sure that the total quantity generated equals the total quantity managed.)

Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted
	261.90	29.10		NA
	-	-		NA
	818.90	43.10		NA
	-	-		NA
	3,759.21	881.79		NA
	1,243.76	219.49		NA
	NA	-		NA
	605	106.80		NA
	NA	-		NA
	NA	-		NA
	NA	-		NA
	NA	-		NA
	NA	-		
				NA
				NA
				NA
				NA
				NA
				NA
				NA
				NA
	NA	-		-
	NA	-		-
	NA	-		-
	NA	-		-
	NA	-		-
NA				NA
NA	-	-		NA
NA	-	-		NA
NA	9,594.75	1,066.08		NA
NA	10,368.19	2,592.05		NA
NA	-	-		NA
NA	NA	-		-
NA	NA	19,440.35		NA
	3,177.35	167.23		NA
	1,693.19	188.13		NA
	NA	-	NA	NA
NA	9,825	9,824.69	NA	NA
NA	-	-	NA	NA
	-	-		NA
	105	104.52	NA	NA
	2,195	2,194.88		NA
			NA	NA
	NA	1,045.18	NA	NA
	NA	-		NA
	NA	-		NA

Please enter data in short tons (1 short ton = 2,000 lbs.)
Please refer to the User's Guide if you need assistance completing this table.

[1] Recycled concrete used as aggregate in the production of new concrete

[2] Recycled fly ash is utilized to displace portland cement in concrete production.

[3] Recycling tires is defined in this analysis as using tires for crumb rubber applications and tire-derived aggregate uses in civil engineering applications

3. In order to account for the avoided electricity-related emissions in the landfilling and combustion pathways, EPA assigns the appropriate regional "marginal" electricity grid mix emission factor based on your location. Select state for which you are conducting this analysis.

Please select state or select national average:	California
Region Location:	Pacific

4. To estimate the benefits from source reduction, EPA usually assumes that the material that is source reduced would have been manufactured from the current mix of virgin and recycled inputs. However, you may choose to estimate the emission reductions from source reduction under the assumption that the material would have been manufactured from 100% virgin inputs in order to obtain an upper bound estimate of the benefits from source reduction. Select which assumption you want to use in the analysis. Note that for materials for which information on the share of recycled inputs used in production is unavailable or is not a common practice; EPA assumes that the current mix is comprised of 100% virgin inputs. Consequently, the source reduction benefits of both the "Current mix" and "100% virgin" inputs are the same.

- (•) Current Mix
- ( ) 100% Virgin

5a. The emissions from landfilling depends on whether the landfill where your waste is disposed has a landfill gas (LFG) control system. If you do not know whether your landfill has LFG control, select "National Average" to calculate emissions based on the estimated proportions of landfills with LFG control in 2009 and go to question 7. If your landfill does not have a LFG system, select "No LFG Recovery" and go to question 7. If a LFG system is in place at your landfill, select "LFG Recovery" and click one of the indented buttons in 5b to indicate whether LFG is recovered for energy or flared.

- ( ) National Average
- (•) LFG Recovery
- ( ) No LFG Recovery

5b. If your landfill has gas recovery, does it recover the methane for energy or flare it?

- (•) Recover for energy
- ( ) Flare
- ( ) Not Applicable

6a. Which of the following moisture conditions and associated bulk MSW decay rate (k) most accurately describes the average conditions at the landfill? The decay rates, also referred to as k values, describe the rate of change per year (yr-1) for the decomposition of organic waste in landfills. A higher average decay rate means that waste decomposes faster in the landfill. Dry landfills typically receive less than 25 inches of rain annually while Average landfills receive more than 25 inches of rain annually. Wet landfills are assumed to represent a landfill that receives relatively high water infiltration. Bioreactor landfills include landfills to which water is added until the moisture content reaches 40 percent moisture on a wet weight basis.

- (•) Dry (k=0.02)
- ( ) Average (k = 0.04) - DEFAULT
- ( ) Wet (k = 0.08)
- ( ) Bioreactor (k = 0.12)

6b. For landfills that recover landfill gas, the landfill gas collection efficiency will vary throughout the life of the landfill. Based on literature and field study measurements for different landfill scenarios, the typical operation landfills represent the current practice at most landfills that capture landfill gas in the United States. The worst-cast collection represent landfills that are just barely in compliance with EPA's New Source Performance Standards (NSPS). The aggressive gas collection best-case recovery scenario for bioreactor landfills, where conditions are controlled in order to achieve decomposition as quickly as possible and to collect gas aggressively.

- (•) Typical operation - DEFAULT
- ( ) Worst-case collection
- ( ) Aggressive gas collection

	Landfill gas collection efficiency (%) assumptions
Typical	*Years 0-2: 0%; Year 3: 50%; Year 4-7: 75%; Years 8-100: 95%*
Worst-case	*Years 0-5: 0%; Years 6-7: 75%; Years 8-100: 95%*
Aggressive	*Year 1: 25%; Years 2-3: 50%; Years 4-7: 75%; Years 8-100: 95%*

7a. Emissions that occur during transport of materials to the management facility are included in this model. You may use default transport distances, indicated in the table below, or provide information on the transport distances for the various MSW management options.

(●) Use Default Distances
( ) Provide Information

7b. If you have chosen to provide information, please fill in the table below. Distances should be from the curb to the landfill, combustor, or material recovery facility (MRF).
***Please note that if you chose to provide information, you must provide distances for both the baseline and the alternative scenarios.**

Management Option	Default Distance (Miles)	Distance (Miles)
Landfill	20	
Combustion	20	
Recycling	20	
Composting	20	

8. If you wish to personalize your results report, input your name & organization, and also specify the project period corresponding to the data you entered above.

Name	
Organization	

Project Period	From		to	

Congratulations! You have finished all the inputs.
A summary of your results awaits you on the sheet(s) titled "Summary Report."
For more detailed analyses of GHG emissions, see the sheet(s) titled "Analysis Results."

GHG Emissions Analysis -- Summary Report

Version 12

GHG Emissions Waste Management Analysis for

Prepared by:

Project Period for this Analysis: 01/00/00 to 01/00/00

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): 747

Commodity	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$
Aluminum Cans	-	291.0	-	NA	11
Steel Cans	-	862.0	-	NA	33
Glass	-	4,641.0	-	NA	180
HDPE	-	1,463.3	-	NA	57
PET	-	712.0	-	NA	28
Mixed Metals	-	10,660.8	-	NA	414
Mixed Plastics	-	12,960.2	-	NA	503
Mixed MSW	NA	19,440.3	-	NA	(1,664)
Carpet	-	3,344.6	-	NA	130
Personal Computers	-	1,881.3	-	NA	73
Concrete	-	19,649.4	NA	NA	763
Asphalt Concrete	-	209.0	NA	NA	8
Asphalt Shingles	-	4,389.8	-	NA	170
Fiberglass Insulation	NA	1,045.2	NA	NA	41
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0

GHG Emissions from Alternative Waste Management Scenario ($MTCO_2E$): (67,621)

Commodity	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Total $MTCO_2E$	Change (Alt - Base) $MTCO_2E$
Aluminum Cans	-	261.9	29.1	-	NA	(2,327)	(2,339)
Steel Cans	-	818.9	43.1	-	NA	(1,474)	(1,508)
Glass	-	3,759.2	881.8	-	NA	(1,011)	(1,191)
HDPE	-	1,243.8	219.5	-	NA	(1,058)	(1,114)
PET	-	605.2	106.8	-	NA	(667)	(694)
Mixed Metals	NA	9,594.8	1,066.1	-	NA	(38,082)	(38,496)
Mixed Plastics	NA	10,368.2	2,592.0	-	NA	(10,077)	(10,580)
Mixed MSW	NA	NA	19,440.3	-	NA	(1,664)	0
Carpet	-	3,177.3	167.2	-	NA	(7,521)	(7,651)
Personal Computers	-	1,693.2	188.1	-	NA	(3,966)	(4,039)
Concrete	NA	9,824.7	9,824.7	NA	NA	303	(459)
Asphalt Concrete	-	104.5	104.5	NA	NA	(5)	(13)
Asphalt Shingles	-	2,194.9	2,194.9	-	NA	(114)	(285)
Fiberglass Insulation	-	NA	1,045.2	NA	NA	41	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0

Total Change in GHG Emissions ($MTCO_2E$): **(67,675)**

Note: a negative value (i.e., a value in parentheses) indicates an emission reduction; a positive value indicates an emission increase.

This is equivalent to…		
Removing annual emissions from	**13,270**	Passenger Vehicles
Conserving	**7,586,828**	Gallons of Gasoline
Conserving	**2,819,771**	Cylinders of Propane Used for Home Barbeques
Conserving	**368**	Railway Cars of Coal
	0.00394%	Annual CO_2 emissions from the U.S. transportation sector
	0.00314%	Annual CO_2 emissions from the U.S. electricity sector

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).

b) Emissions estimates provided by this model are intended to support voluntary GHG measurement and reporting initiatives.

c) The GHG emissions results estimated in WARM indicate the full life-cycle benefits waste management alternatives. Due to the timing of the GHG emissions from the waste management pathways, (e.g., avoided landfilling and increased recycling), the actual GHG implications may accrue over the long-term. Therefore, one should not interpret the GHG emissions implications as occurring all in one year, but rather through time.

Waste Reduction Model (WARM) -- Results

Total GHG Emissions from Baseline MSW Generation and Management ($MTCO_2E$):	747
Total GHG Emissions from Alternative MSW Generation and Management ($MTCO_2E$):	(67,621)
Incremental GHG Emissions ($MTCO_2E$):	(67,675)

$MTCO_2E$ = metric tons of carbon dioxide equivalent

Per Ton Estimates of GHG Emissions for Alternative Management Scenarios

Material	GHG Emissions per Ton of Material Source Reduced ($MTCO_2E$)	GHG Emissions per Ton of Material Recycled ($MTCO_2E$)	GHG Emissions per Ton of Material Landfilled ($MTCO_2E$)	GHG Emissions per Ton of Material Combusted ($MTCO_2E$)	GHG Emissions per Ton of Material Composted ($MTCO_2E$)
Aluminum Cans	(4.94)	(8.89)	0.04	0.05	NA
Aluminum Ingot	(7.27)	(6.97)	0.04	0.05	NA
Steel Cans	(3.18)	(1.80)	0.04	(1.55)	NA
Copper Wire	(7.26)	(4.89)	0.04	0.04	NA
Glass	(0.53)	(0.28)	0.04	0.04	NA
HDPE	(1.47)	(0.86)	0.04	1.69	NA
LDPE	(1.79)	NA	0.04	1.70	NA
PET	(2.22)	(1.11)	0.04	1.47	NA
LLDPE	(1.57)	NA	0.04	1.70	NA
PP	(1.55)	NA	0.04	1.70	NA
PS	(2.50)	NA	0.04	2.02	NA
PVC	(1.98)	NA	0.04	0.84	NA
PLA	(2.18)	NA	(1.62)	(0.44)	(0.20)
Corrugated Containers	(5.59)	(3.11)	(0.76)	(0.33)	NA
Magazines/third-class mail	(8.64)	(3.07)	(0.76)	(0.23)	NA
Newspaper	(4.85)	(2.78)	(1.27)	(0.38)	NA
Office Paper	(7.99)	(2.85)	(0.05)	(0.32)	NA
Phonebooks	(6.27)	(2.65)	(1.27)	(0.38)	NA
Textbooks	(9.11)	(3.11)	(0.05)	(0.32)	NA
Dimensional Lumber	(2.02)	(2.46)	(1.09)	(0.40)	NA
Medium-density Fiberboard	(2.22)	(2.47)	(1.09)	(0.40)	NA
Food Scraps	0.00	NA	0.17	(0.07)	(0.20)
Yard Trimmings	0.00	NA	(0.44)	(0.09)	(0.20)
Grass	0.00	NA	0.01	(0.09)	(0.20)
Leaves	0.00	NA	(0.76)	(0.09)	(0.20)
Branches	0.00	NA	(1.09)	(0.09)	(0.20)
Mixed Paper (general)	NA	(3.52)	(0.72)	(0.34)	NA
Mixed Paper (primarily residential)	NA	(3.52)	(0.76)	(0.33)	NA
Mixed Paper (primarily from offices)	NA	(3.59)	(0.53)	(0.30)	NA
Mixed Metals	NA	(3.97)	0.04	(1.06)	NA
Mixed Plastics	NA	(0.98)	0.04	1.58	NA
Mixed Recyclables	NA	(2.80)	(0.63)	(0.29)	NA
Mixed Organics	NA	NA	(0.12)	(0.08)	(0.20)
Mixed MSW	NA	NA	(0.09)	0.07	NA
Carpet	(3.96)	(2.37)	0.04	1.26	NA
Personal Computers	(54.15)	(2.35)	0.04	(0.13)	NA
Clay Bricks	(0.28)	NA	0.04	NA	NA
Concrete	NA	(0.01)	0.04	NA	NA
Fly Ash	NA	(0.87)	0.04	NA	NA
Tires	(4.32)	(0.39)	0.04	0.51	NA
Asphalt Concrete	(0.11)	(0.08)	0.04	NA	NA
Asphalt Shingles	(0.20)	(0.09)	0.04	(0.34)	NA

Drywall	(0.22)	0.03	0.13	NA	NA
Fiberglass Insulation	(0.39)	NA	0.04	NA	NA
Vinyl Flooring	(0.62)	NA	0.04	(0.14)	NA
Wood Flooring	(4.06)	NA	0.07	(0.53)	NA

GHG Emissions from Baseline Management of Municipal Solid Wastes

Material	Baseline Generation of Material (Tons)	Estimated Recycling (Tons)	Annual GHG Emissions from Recycling ($MTCO_2E$)	Estimated Landfilling (Tons)	Annual GHG Emissions from Landfilling ($MTCO_2E$)	Estimated Combustion (Tons)	Annual GHG Emissions from Combustion ($MTCO_2E$)	Estimated Composting (Tons)	Annual GHG Emissions from Composting ($MTCO_2E$)	Total Annual GHG Emissions ($MTCO_2E$)
Aluminum Cans	291.0	0.0	0.0	291.0	11.3	0.0	0.0	NA	NA	11.3
Aluminum Ingot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Steel Cans	862.0	0.0	0.0	862.0	33.5	0.0	0.0	NA	NA	33.5
Copper Wire	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Glass	4,641.0	0.0	0.0	4,641.0	180.1	0.0	0.0	NA	NA	180.1
HDPE	1,463.3	0.0	0.0	1,463.3	56.8	0.0	0.0	NA	NA	56.8
LDPE	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PET	712.0	0.0	0.0	712.0	27.6	0.0	0.0	NA	NA	27.6
LLDPE	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PP	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PS	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PVC	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PLA	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corrugated Containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Magazines/third-class mail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Newspaper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Office Paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Phonebooks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Textbooks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Dimensional Lumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Medium-density Fiberboard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Food Scraps	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yard Trimmings	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Leaves	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Branches	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed Paper (general)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Paper (primarily residential)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Paper (primarily from offices)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Metals	10,660.8	0.0	0.0	10,660.8	413.8	0.0	0.0	NA	NA	413.8
Mixed Plastics	12,960.2	0.0	0.0	12,960.2	503.1	0.0	0.0	NA	NA	503.1
Mixed Recyclables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Organics	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed MSW	19,440.3	NA	NA	19,440.3	(1,663.5)	0.0	0.0	NA	NA	(1,663.5)
Carpet	3,344.6	0.0	0.0	3,344.6	129.8	0.0	0.0	NA	NA	129.8
Personal Computers	1,881.3	0.0	0.0	1,881.3	73.0	0.0	0.0	NA	NA	73.0
Clay Bricks	0.0	NA	NA	0.0	0.0	NA	NA	NA	NA	0.0
Concrete	19,649.4	0.0	0.0	19,649.4	762.7	NA	NA	NA	NA	762.7
Fly Ash	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA	0.0
Tires	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Asphalt Concrete	209.0	0.0	0.0	209.0	8.1	NA	NA	NA	NA	8.1
Asphalt Shingles	4,389.8	0.0	0.0	4,389.8	170.4	0.0	0.0	NA	NA	170.4
Drywall	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA	0.0
Fiberglass Insulation	1,045.2	NA	NA	1,045.2	40.6	NA	NA	NA	NA	40.6
Vinyl Flooring	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
Wood Flooring	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
Total	81,549.9	0.0	0.0	81,549.9	747.3	0.0	0.0	0.0	0.0	747.3

GHG Emissions from Projected Alternative Management of Municipal Solid Wastes

Material	Baseline Generation of Material (Tons)	Projected Source Reduction (Tons)	Annual GHG Emissions from Source Reduction ($MTCO_2E$)	Projected Recycling (Tons)	Annual GHG Emissions from Recycling ($MTCO_2E$)	Projected Landfilling (Tons)	Annual GHG Emissions from Landfilling ($MTCO_2E$)	Projected Combustion (Tons)	Annual GHG Emissions from Combustion ($MTCO_2E$)	Projected Composting (Tons)	Annual GHG Emissions from Composting ($MTCO_2E$)	Total Annual GHG Emissions ($MTCO_2E$)
Aluminum Cans	291.0	0.0	0.0	261.9	(2,328.4)	29.1	1.1	0.0	0.0	NA	NA	(2,327.3)
Aluminum Ingot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Steel Cans	862.0	0.0	0.0	818.9	(1,475.8)	43.1	1.7	0.0	0.0	NA	NA	(1,474.1)
Copper Wire	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Glass	4,641.0	0.0	0.0	3,759.2	(1,045.6)	881.8	34.2	0.0	0.0	NA	NA	(1,011.3)
HDPE	1,463.3	0.0	0.0	1,243.8	(1,066.1)	219.5	8.5	0.0	0.0	NA	NA	(1,057.6)
LDPE	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PET	712.0	0.0	0.0	605.2	(670.8)	106.8	4.1	0.0	0.0	NA	NA	(666.6)
LLDPE	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PP	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PS	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PVC	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PLA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corrugated Containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Magazines/third-class mail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Newspaper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Office Paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Phonebooks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Textbooks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Dimensional Lumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Medium-density Fiberboard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Food Scraps	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yard Trimmings	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Leaves	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Branches	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed Paper (general)	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Paper (primarily residential)	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Paper (primarily from offices)	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Metals	10,660.8	NA	NA	9,594.8	(38,123.4)	1,066.1	41.4	0.0	0.0	NA	NA	(38,082.0)
Mixed Plastics	12,960.2	NA	NA	10,368.2	(10,177.9)	2,592.0	100.6	0.0	0.0	NA	NA	(10,077.3)
Mixed Recyclables	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Organics	0.0	NA	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed MSW	19,440.3	NA	NA	NA	NA	19,440.3	(1,663.5)	0.0	0.0	NA	NA	(1,663.5)
Carpet	3,344.6	0.0	0.0	3,177.3	(7,527.3)	167.2	6.5	0.0	0.0	NA	NA	(7,520.9)
Personal Computers	1,881.3	0.0	0.0	1,693.2	(3,973.4)	188.1	7.3	0.0	0.0	NA	NA	(3,966.1)
Clay Bricks	0.0	0.0	0.0	NA	NA	0.0	0.0	NA	NA	NA	NA	0.0
Concrete	19,649.4	NA	NA	9,824.7	(78.0)	9,824.7	381.3	NA	NA	NA	NA	303.4
Fly Ash	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	NA	NA	0.0
Tires	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Asphalt Concrete	209.0	0.0	0.0	104.5	(8.6)	104.5	4.1	NA	NA	NA	NA	(4.5)
Asphalt Shingles	4,389.8	0.0	0.0	2,194.9	(199.5)	2,194.9	85.2	0.0	0.0	NA	NA	(114.3)
Drywall	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA	0.0
Fiberglass Insulation	1,045.2	0.0	0.0	NA	NA	1,045.2	40.6	NA	NA	NA	NA	40.6
Vinyl Flooring	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
Wood Flooring	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
Total	81,549.9	0.0	0.0	43,646.5	(66,674.6)	37,903.4	(946.9)	0.0	0.0	0.0	0.0	(67,621.5)

Incremental GHG Emissions from Projected Alternative Management of Municipal Solid Wastes

Material	Source Reduction (Tons)	Incremental GHG Emissions from Source Reduction ($MTCO_2E$)	Incremental Recycling (Tons)	Incremental GHG Emissions from Recycling ($MTCO_2E$)	Incremental Landfilling (Tons)	Incremental GHG Emissions from Landfilling ($MTCO_2E$)	Incremental Combustion (Tons)	Incremental GHG Emissions from Combustion ($MTCO_2E$)	Incremental Composting (Tons)	Incremental GHG Emissions from Composting ($MTCO_2E$)	Total Incremental GHG Emissions ($MTCO_2E$)
Aluminum Cans	0.0	0.0	261.9	(2,328.4)	(261.9)	(10.2)	0.0	0.0	NA	NA	(2,338.6)
Aluminum Ingot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Steel Cans	0.0	0.0	818.9	(1,475.8)	(818.9)	(31.8)	0.0	0.0	NA	NA	(1,507.6)
Copper Wire	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Glass	0.0	0.0	3,759.2	(1,045.6)	(3,759.2)	(145.9)	0.0	0.0	NA	NA	(1,191.5)
HDPE	0.0	0.0	1,243.8	(1,066.1)	(1,243.8)	(48.3)	0.0	0.0	NA	NA	(1,114.4)
LDPE	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PET	0.0	0.0	605.2	(670.8)	(605.2)	(23.5)	0.0	0.0	NA	NA	INPUT ERROR: Make sure tons managed
LLDPE	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PP	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PS	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PVC	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
PLA	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corrugated Containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Magazines/third-class mail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Newspaper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Office Paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Phonebooks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Textbooks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Dimensional Lumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Medium-density Fiberboard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Food Scraps	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yard Trimmings	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Leaves	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Branches	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed Paper (general)	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Paper (primarily residential)	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Paper (primarily from offices)	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Metals	NA	NA	9,594.8	(38,123.4)	(9,594.8)	(372.4)	0.0	0.0	NA	NA	(38,495.8)
Mixed Plastics	NA	NA	10,368.2	(10,177.9)	(10,368.2)	(402.4)	0.0	0.0	NA	NA	(10,580.3)
Mixed Recyclables	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Mixed Organics	NA	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed MSW	NA	NA	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
Carpet	0.0	0.0	3,177.3	(7,527.3)	(3,177.3)	(123.3)	0.0	0.0	NA	NA	(7,650.7)
Personal Computers	0.0	0.0	1,693.2	(3,973.4)	(1,693.2)	(65.7)	0.0	0.0	NA	NA	(4,039.1)
Clay Bricks	0.0	0.0	NA	NA	0.0	0.0	NA	NA	NA	NA	0.0
Concrete	NA	NA	9,824.7	(78.0)	(9,824.7)	(381.3)	NA	NA	NA	NA	(459.3)
Fly Ash	NA	NA	0.0	0.0	0.0	0.0	NA	NA	NA	NA	0.0
Tires	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	0.0
Asphalt Concrete	0.0	0.0	104.5	(8.6)	(104.5)	(4.1)	NA	NA	NA	NA	(12.6)
Asphalt Shingles	0.0	0.0	2,194.9	(199.5)	(2,194.9)	(85.2)	0.0	0.0	NA	NA	(284.7)
Drywall	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA	0.0
Fiberglass Insulation	0.0	0.0	NA	NA	0.0	0.0	NA	NA	NA	NA	0.0
Vinyl Flooring	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
Wood Flooring	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0	NA	NA	0.0
Total	0.0	0.0	43,646.5	(66,674.6)	(43,646.5)	(1,694.1)	0.0	0.0	0.0	0.0	(67,674.5)

a) For explanation of methodology, see the EPA report:
Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks (EPA530-R-06-004)
-- available on the Internet at http://epa.gov/climatechange/wycd/waste/downloads/fullreport.pdf (5.6 Mb PDF file).

b) Emissions estimates provided by this model are intended to support voluntary GHG measurement and reporting initiatives.