

## IV. Reference Year Population, Waste Generation, and Waste Reduction [ORC Section 3734.53 (A)(5)-(6)]

### A. Reference Year Population and Residential/Commercial Waste Generation

The population of Darke County in the reference year, 2012, was estimated to be 52,507. This estimate was published by the U.S. Census Bureau and is based on the 2010 census.<sup>1</sup> Ohio's solid waste law states that when a municipal corporation is located in more than one solid waste district, the entire corporation is to be included in the jurisdiction of the solid waste district where the majority of the population resides. As a result of this requirement, the Darke County Solid Waste Management District population must be adjusted. The Village of Bradford is located in both Darke and Miami Counties. The Miami county population of Bradford is greater than the population residing in Darke County. Therefore, all of the Village of Bradford is included in the Miami County Solid Waste Management District. The Village of Burkettsville is located in both Darke and Mercer Counties. The population in Mercer County is more than the population in Darke County so the entire population of Burkettsville is included with Mercer County. The adjusted population of the Darke County Solid Waste Management District for the reference year is 51,675. This is the Darke County SWMD population for 2012 which will be used throughout this Plan.

Table IV-1.A. Reference Year Population	
2012 Darke County population before adjustments	52,507
Less Bradford (part in Darke County)	759
Less Burkettsville (part in Darke County)	73
Adjusted District population	51,675

In past plans, the District has calculated the per capita waste generation for the reference year by adding the amount of residential/commercial waste that was reported as being sent for disposal in the reference year and the amount of reported waste diversion.<sup>2</sup> Since there has been virtually no reported or observed open dumping or open burning in the District, no allowance was made for waste that was not managed by appropriate disposal or waste diversion. The same method is used in this Plan. However, for this Plan the District is adjusting the amount of waste for disposal. After examining the amount of waste disposal reported by industry, it is believed that some industrial waste was recorded as residential/commercial when entering disposal facilities. The basis for the

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1 <http://quickfacts.census.gov/qfd/states/39/39037.html>

2 "Waste diversion" is used here to include waste reduction, reuse, recycling, and composting.

decision to make this adjustment is discussed in Section G, “Reconciliation of Waste Generation,” at the end of this chapter.

**Table IV-1.B Residential/Commercial Waste Generation for Reference Year, 2012**

	Reported Total Tons	Total Adjusted Tons	Pounds/ person/day
Tons MSW disposed (Table III-1, asbestos and general)	34,788		
Less tons of industrial waste mischaracterized as R/C waste	1,667		
Tons res/com waste to be used for calculations		33,121	3.51
Tons reported recycled (Appendix F, Table A)		25,133	2.66
<b>Tons residential/commercial waste generation</b>		<b>58,254</b>	<b>6.18</b>

Sample calculation: (((58,254 tons/51,675 population)/365 days) x 2000 lbs.)= 6.18 pounds per person per day.

The amount calculated using the adjusted disposal amount and reported recycling is substantially more than the national average individual waste generation of 4.4 pounds per person per day as reported by the United States Environmental Protection agency for 2011 in the report, Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2011.<sup>3</sup> However, it is consistent with the residential/commercial waste generation which was calculated by using reported waste disposal and reported recycling in the District's last Plan Update. The calculated residential/commercial waste disposal for the reference year for that plan, 2005, was 6.34 pounds per person per year. Additional information regarding the residential and commercial recycling data and the methods used for collecting and verifying the data are included in Section E of this Chapter, Reference Year Waste Reduction, *Residential/Commercial sector*.

In this Plan, we are using **58,254** tons and **6.18** pounds per person per day (Table IV-1.B.) as the amount of residential/commercial waste generation in the reference year, 2012.

#### B. Industrial Waste Generation

In the spring of 2013, all of the manufacturing industries in Darke County were surveyed using either a printed survey form and/or by telephone. A copy of the industrial survey

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<sup>3</sup> United States Environmental Protection Agency Solid Waste and Emergency Response (5306P)

Washington, DC 20460. EPA530-F-13-001 May 2013. [www.epa.gov/wastes](http://www.epa.gov/wastes). 2011 is the most recent year for which figures have been published.

form that was mailed is included in Appendix F at the end of this Plan. Thirty industries out of 42 surveyed responded with useable data. When necessary follow-up calls were made to clarify confusing or questionable responses. The District is satisfied that the amounts reported were generated by the reporting industry at a facility in the District and are as accurate as possible. Some small industries reported volumes instead of weight. Standard conversion factors were applied as needed. The industries that responded represent approximately 3,000 employees and reported recycling 14,785.97 tons. The responding industries represent approximately 80% of the industrial employment in Darke County in 2012. Landfills and transfer facilities reported disposing of 1,009 tons of industrial waste generated from operations. The amount of industrial waste reported by disposal facilities is significantly less than the amount reported as sent for disposal by the industries that responded to the waste and recycling survey. The survey form asked the reporting industries to check a box that indicated whether the disposal amounts reported were estimated or actual. The majority of the reported amounts were represented as actual.

**Table IV-3.A. Industrial Survey Results for Responding Industries Listed in General Standard Industrial Code Categories**

SIC	Number of Responses	Number of Employees	Reported Disposal in Tons	Reported Recycling in Tons	Reported Waste Generation in Tons
1700	2			4	4
2000	3			147	147
2400	1	58	10	9	19
2700	3	8	1	40	41
2800	2	129	131	312	443
2900	1	40	0	0	0
3000	5	316	260	313	573
3200	2	110	214	6,507	6,721
3300	1	27	9	63	72
3400	1	200	40	133	173
3500	5	51	5	51	56
3600	1	375	817	2,059	2,876
3700	2	692	950	2,569	3,518
3800	1	600	240	2,579	2,819
<b>Total</b>	<b>30</b>	<b>2,606</b>	<b>2,675</b>	<b>14,786</b>	<b>17,461</b>

After examining the evidence the District believes that the some industrial waste is entering disposal facilities as residential/commercial waste. This is very likely because waste haulers often collect both commercial and industrial waste on the same route with the same truck. It is likely that some mixed loads are not designated as industrial waste. Therefore, the District is using 2,675 tons as the amount of industrial disposal.

**Table IV-3.B. Industrial Waste Generation Calculated Using Reported Disposal and Reported Recycling**

	Reported Total Tons	Pounds/person/day
Industrial disposal reported on surveys	2,675	0.28
Industrial recycling reported on surveys	14,786	1.57
Industrial waste generation	17,461	1.85

Sample calculation: (((17,461 tons/51,675 population)/365 days) x 2000 lbs.)=1.85 pounds per person per day

C. Exempt Waste

The amount of exempt waste reported in Table IV-4 is the amount reported as being received by landfills, transfer and treatment facilities in Ohio and Indiana.

**Table IV-4 Exempt Waste Generated in the District and Disposed at Publicly Available Landfills**

Type of Waste Stream	Total Exempt Waste	Generation Rate (Pounds/person/day)
Uncharacterized exempt waste (Table III-1)	960	
Exempt waste from construction and demolition (Table III-1)	2,629	
Total Exempt Waste	3,589	0.38

Sample calculation: ((3,589 tons/51,675 population)/365 days x 2000 lbs.) = .38 pounds per person per day.

D. Total District Waste Generation in the Reference Year

**Table IV-5 Total Waste Generation for the Reference Year, 2012**

Type of Waste Stream	Tons in 2012	Generation Rate (pounds/person/day)
Residential/commercial	58,254	6.18
Industrial	17,461	1.57
Exempt	3,589	0.38
Total	79,304	8.13

Generation Rate Calculation: 79,304 tons generated x 2000 lbs. = 158,608

Ibs. divided by 365 days = 434,543 lbs. divided by 51,675=8.13

Ibs./person/day

E. Reference Year Waste Reduction

*1. Residential/Commercial Sector*

Tables IV-6. A. that follows lists all of the known and documented waste reduction and recycling of residential/commercial waste in the Darke County Solid Waste Management District in 2012.

Note that Table IV-6.A. lists information from recycling facilities and programs and from composting and other yard waste management programs. Some of the programs and facilities listed do not have recycling amounts entered. If no amount is entered the facility or program 1) did not report the amount recycled in the reference year, 2) reported the amount recycled from two or more programs and did not supply information for individual programs, 3) the program or facility reported data for industrial recycling only in the reference year. All of the programs and facilities that are listed were available during the reference year.

At the end of Table IV-6.A. recycling data is entered for recycling reported by commercial entities. All of the material listed in this section was reported by the entity that generated the material and arranged for it to be recycled. The amount entered was reported by the generator and does not represent data supplied by a listed recycling facility or program. Some adjustments were necessary to avoid double counting of materials that were reported both by the generator and a waste hauler/recycling collector or a processing facility.

Table IV-6. B. shows residential/commercial recycling by material type. The commingled material is primarily material that was collected from curbside or commercial accounts and which was measured before separation at a material

recovery facility. The “other” is uncharacterized recycling reported by one large commercial retailer that manages recycling collection and marketing through its internal supply network.

Table 6.A. and Table 6.B. do not show waste reduction. The District knows that some Darke County residents and business are successfully reducing waste. However, the amount of waste reduced by these efforts is difficult to document and report. Also, the District does not report waste reduction data after the first year that a waste reduction was reported. For instance, several nursing homes have implemented programs to reduce substantial amounts of waste by replacing disposable patient care items with items that can be laundered, sanitized, and reused. The waste reduction was measured and reported in the start-up years of the program, but is not reported now that it has become a standard practice. No credible waste reduction was reported in 2012.

a. *Methods of Compiling Data regarding residential/commercial waste reduction, recycling and composting.*

In early 2013, surveys requesting information on 2012 waste disposal and recycling were sent to local governments, waste haulers, recyclers, and non-profit organizations that operate recycling programs. Retailers and commercial businesses were mailed surveys or were surveyed by telephone. Copies of the surveys and a spread sheet with the survey results are included in Appendix F of this Plan Update. District staff conduct surveys of the same businesses every year, updating the list to include new businesses as needed. Businesses have come to expect the survey so the percentage of surveys returned with information is usually high.

If the survey response was confusing or the amounts reported varied substantially from the amount reported in previous years or from expected amounts, the planning consultant made follow-up calls to verify that the amount reported represented material that was actually generated in the district and that the amounts reported and the units used were correct.

The reporting entities provided data for the net total recycled. None of the entities reported the gross amount received or the amount of residual waste so those columns have been omitted from the tables.

Recycling data was also supplied by The Ohio Environmental Protection Agency. The Agency gathered data from material recovery facilities (MRFs), scrap tire facilities, registered composting facilities, and chain stores that have stores in multiple locations in Ohio. The data reported through Ohio EPA was broken out by solid waste district. This data has been very helpful because it has made information available to the District from sources that did not previously respond to the District’s surveys.

*b. Methods of eliminating double counting:*

The District's mail and telephone surveys asked respondents to list the collectors, processor, or end-use markets for the materials that were recycled. Double counting was eliminated to the extent possible by eliminating the materials that were identified as having been sent to Rumpke facilities or to one of the other recycling collectors/processors that reported to the District or to Ohio EPA. The spread sheet in Appendix F titled "Darke County Residential/Commercial Recycling Survey Summary (2012 Date)" shows the source of the residential/commercial recycling data and the specific amounts subtracted to avoid double counting.

**Table IV-6.A. 2012 Residential/Commercial Recycling and Waste Reduction in the District Sorted by Reporting Entity**

	Recycling or Composting Programs	Recycling	Yard Waste Composting	Total
1	Village of Arcanum curbside recycling	Rumpke MRF -#56		
2	City of Greenville curbside recycling	Rumpke MRF -#56		
3	Village of Palestine curbside recycling	Not reported		
4	Village of Versailles curbside recycling	404		404
5	Village of Ansonia/Brown Township recycling drop-off	Rumpke MRF -#56		
6	Village of Arcanum/Twin Township recycling drop-off	Rumpke MRF -#56		
7	Butler township recycling drop-off	Rumpke MRF -#56		
8	Village of Gettysburg/Adams Township recycling drop-off	Rumpke MRF -#56		
9	Village of Hollansburg/Harrison Township recycling drop-off	Rumpke MRF -#56		
10	Village of New Madison recycling drop-off	Rumpke MRF -#56		
11	Village of New Weston/ Allen Township recycling drop-off	Rumpke MRF -#56		
12	Village of North Star/Wabash Township recycling drop-off	Rumpke MRF -#56		
13	Village of Palestine recycling drop-off	Rumpke MRF -#56		
14	Village of Pittsburg/Monroe Township recycling drop-off	Rumpke MRF -#56		
15	Union City/Jackson Township recycling drop-	Rumpke MRF -#56		
16	Wayne Township recycling drop-off	Rumpke MRF -#56		
17	Rumpke Transfer Facility Drop-off	Rumpke MRF -#56		
18	Ansonia Boy Scouts newspaper drive	Not reported		
19	Christina's Consignments - Clothing resale	Not reported		
20	Commercial Paper Drop-off (Rumpke)-Greenville	Rumpke MRF -#56		
21	Darke County Government Recycling	Rumpke MRF -#56		
22	Darke County SWMD Appliance Recycling Day	4		4
23	Darke County SWMD Electronics Recycling Day	84		84
24	Darke County SWMD Paper Shredding Day	6		6
25	Darke County SWMD Tire Collection Day	99		99
26	Darke County SWMD Dry-cell battery collection	2		2

	<b>Recycling or Composting Programs</b>	<b>Recycling</b>	<b>Yard Waste Composting</b>	<b>Total</b>
27	Darke County School Recycling: Ansonia Local Schools, Ansonia Anthony Wayne Schools, Greenville Franklin Monroe Local Schools, Arcanum St. Mary's School, Greenville Arcanum Butler Local Schools, Arcanum Mississinawa Valley Local Schools, Union City Versailles Exempted Schools, Versailles	Rumpke MRF -#56		
28	Darke County Schools Miscellaneous Recycling	312		312
29	Goodwill Industries - clothing/household items resale			
30	Osgood Paper Recycling Monthly Drive	107		107
31	Special Olympics Clothing Drop-box	Not reported		
32	The Store-clothing/household item resale	Not reported		
33	Wayne Lakes Village aluminum can recycling	Rumpke MRF -#56		
34	PFP (Kamps) - Pallet recycling	Only industrial industrial		
35	Union City Recycling -scrap yard	Not reported		
36	1- Shot Recycling -scrap yard	3,272		3,272
37	A & M Pallet-pallet reclaimer	Only industrial industrial		
38	Anderson Pallet Service, Inc.-pallet reclaimer	Not reported		
39	Boggs Recycling-scrap yard	Not reported		
40	Confidential Material Destruction, Inc.-document destruction /paper recycling	36		36
41	Franklin Iron & Metal Corp.-scrap yard	Only industrial industrial		
42	Integrity Metals - scrap yard	Only industrial industrial		
43	Liberty Tires Services of Ohio	130		130
44	Midwest Iron & Metal - scrap yard	Only industrial industrial		
45	Montgomery Paper Company -paper recycler	Only industrial industrial		
46	My Way Trading, Inc. - industrial plastic recycler	Only industrial industrial		
47	Ohio Recycling Inc.-MRF/scrap yard	Not reported		
48	OmniSource Corp.-scrap yard	Only industrial industrial		
49	Polysource, Inc.-industrial plastic recycler	Only industrial industrial		
50	R & R Tire Disposal	121		121
51	Recycling Center, Inc. (Richmond) - scrap yard	Only industrial industrial		
52	Rock Tenn Converting Co-end use industry	71		71
53	Rumpke Recycling Materials Recovery Facility	3,567		3,567
54	Rumpke Transportation Co. LLC	314		314
55	Schoenlein Salvage-scrap yard	Only industrial industrial		
56	Shred-It Cincinnati-Dayton-document destruction/paper recycling	See #25 above		
57	Smith Pallet Recycling-pallet reclaimer	Only industrial industrial		
58	Special Waste Systems-scrap yard	2		2
59	Superior Pallet - pallet reclaimer	Only industrial industrial		
60	Allied Waste Services of Celina - waste collection/recycling	Not reported		

	<b>Recycling or Composting Programs</b>	<b>Recycling</b>	<b>Yard Waste Composting</b>	<b>Total</b>
61	Best Way - waste collection/recycling -commercial	5		5
62	Maharg Trash Service - waste collection/recycling	Not reported		
63	Rumpke Consolidated Companies-waste collection/recycling	See #52 above		
64	Ansonia Village-field spreading of leaves		112	112
65	Arcanum Village-field spreading of leaves		316	316
66	Downing Fruit Farm-apple pumice composting		12	12
67	Fitzwater Tree & Lawn Care-class 4 compost facility		1,020	1,020
68	Fresh Aire Farm -class 3 composting facility		1,791	1,791
69	Gettysburg Village-field spreading of leaves		37	37
70	Greenville- yard waste collection and composting	See Fitzwater #64		
71	New Madison Village--field spreading of leaves		257	257
72	Palestine Village-field spreading of leaves		87	87
73	Pitsburg Village-field spreading of leaves		68	68
74	Union City (Village)-field spreading of leaves		133	133
75	Versailles Village-class 4 composting facility		1,472	1,472
76	Wayne Lakes Village-leaf and brush composting		20	20
77	Brookside Wood Products-class 4 composting facility		448	448
	<b>Sub-Total recycling through identified programs and facilities</b>	<b>8,536</b>	<b>5,772</b>	<b>14,308</b>
	<b>Sources of additional commercial recycling data. (These are NOT recycling programs or facilities, but sources of data)</b>			
78	Commercial Recycling through internal supply chains for large retailers. Reported directly to OEPA. See Appendix F.	888		888
79	Commercial recycling reported to District by Darke county businesses. See Appendix F.	10,083		10,083
	Adjustments to avoid double counting	-147		-147
	<b>Total Residential/Commercial Recycling</b>	<b>19,360</b>	<b>5,772</b>	<b>25,133</b>

**Table IV-6.B.****Reference Year Recycling by Materials Type**

<b>Material Recycled</b>	<b>Amount reported in tons</b>
Appliances	4
Lead Acid Batteries	86
Dry Cell/Household Batteries	2
Glass	371
Ferrous Metals	3,608
Non-Ferrous Metal (includes aluminum cans)	175
Corrugated Cardboard	3,611
Paper (all types except corrugated cardboard)	1,359
Plastic (all types)	140
Tires	572
Rubber	513
Used Motor Oil	95
Food	234
Wood (includes wood pallets)	8,096
Yard Waste	5,760
Electronics	86
Co-mingled (from residential and commercial sources)	278
Uncharacterized commercial	142
<b>Total all reported residential/commercial recycling</b>	<b>25,133</b>

*Review of 2012 recycling programs, facilities and services:*

Programs and facilities are discussed in this section are listed in Tables III-4 and III-5 in the preceding chapter.

Residential curbside: In 2012, there were four residential curbside recycling programs operating in Darke County. The City of Greenville and Arcanum Village provide curbside recycling and separate yard waste collection to city and village residents through contracts with Rumpke Waste, Inc. In Greenville residents may select a fixed price waste container or may choose to pay for waste collection by purchasing specially marked waste bags and participating in the “pay as you throw” program. There is no additional charge for recycling. Versailles Village collects recyclables at curbside from residents using Village staff and equipment. The program is available to all residents and is included in the price of waste collection. Versailles also collects recyclables from businesses in the Village. In 2012, Versailles took most of the material that was collected to Ohio Recycling in Chickasaw. However, the Village may take materials to other recyclers.

Subscription curbside recycling was available in the Village of Palestine for residents who subscribe to the service provided by Rumpke. Rumpke provides a pay-as-you throw bag option or the fixed price container option for Palestine residents.

The curbside programs appear to be supported by the residents. However, it is not possible to compare program performance year to year or to make comparisons among programs because, with the exception of Versailles, the amount collected is not reported to each program individually. The amounts collected are reported in the totals submitted annually by the waste hauling firms that provide the services. In these reports, the material from individual curbside programs is reported with the material from all the residential and commercial recycling collection managed by the reporting hauler/recycler. The lack of recycling data that is specific to individual curbside programs and drop-off locations is definitely a problem that needs to be addressed. Although the overall residential-commercial recycling rate can be compared from year to year, there is no reliable mechanism for comparing programs to program or evaluating the effectiveness of individual curbside programs and District funded drop-off locations. This problem will be discussed further in Chapter V of this Plan.

At the present time, Rumpke, which manages the majority of the curbside collection is collecting virtually all of the materials for which there are marketing opportunities. In the near future, there are not likely to be substantial gains in the amount recycled by adding additional materials to residential curbside. Therefore, it is important that the municipalities that have programs, the District, and the recycling collectors continue to cooperate in promoting the programs to maintain or increase participation and to maintain or increase the quantity and quality of the materials that are collected from each participant. The District should work with the municipalities and the collectors to provide program specific recycling reports so that programs can monitor the amount collected and make program adjustments if needed.

The District should also continue to encourage the villages that do not have curbside collection to add curbside programs. The recommendations for improvements in curbside recycling will be addressed Chapter V of this Plan.

*Responsible entity for curbside program:* Local government with assistance from the District for education and promotion.

*Service area benefit:* Local government jurisdiction in which curbside is implemented.

*Materials to be recycled:* In this plan, we are calling the materials that are collected in Greenville, Arcanum and Versailles (even though Rumpke is not necessarily the processor) the "Rumpke Mix," which is all colors of glass bottles and jars, aluminum, steel (tin), and aerosol cans, #1 & #2 and #6 plastic (natural and colored) containers, newspaper, mixed paper, magazines, phone books, regular and coated paperboard cartons, and corrugated cardboard.

Rumpke promotional literature lists the materials that are accepted and not accepted in language that is more likely to be clear to residents, so it is quoted here:

**Acceptable items include:**

Plastic bottles and jugs	Glass jars and bottles
Aluminum and metal cans	Magazines and catalogues
Cereal and snack boxes	Cardboard, (flattened to 2' x 3')
Newspaper with inserts	Cartons (juice, milk, and egg substitute containers)
Junk mail and phone books	Clean pizza boxes (free of food and grease)
Empty aerosol cans (tips removed)	

**Items that are excluded include:**

Garbage	Buckets	Ceramics and dishes
Food and yard waste	Butter tubs	Pots and pans
Plastic bags	Light bulbs	Foil juice pouches
Syringes	Drinking glasses	Toys or clothing
Electronics	Batteries	

*Future recovery rates:* Recycling from curbside programs is not measured separately in Greenville and Arcanum; it is mixed with recycling from drop-offs and some commercial recycling. The Village of Versailles reported recycling 404 tons. This included the Versailles multi-material drop-box material which is also collected by the village. Future recovery rates are addressed at the end of the residential/commercial recycling discussion in Chapter 5 of this plan following the discussion of the recycling programs that are to be implemented during the planning period.

**Residential Drop-off Recycling:**

*Darke County Solid Waste Management District Recycling Drop-off Bins:* In order to extend recycling services to the areas in the county not served by curbside, the District has a system of drop-off bins which are available 24 hours a day, 7 days a week.

The drop-offs consist of 8 yard bins which are placed in locations where they will be easy to access and also can be monitored to reduce the chances of litter and illegal dumping. The bins include signs that clearly state the materials that are and are not accepted. Most of the sites have two bins which are emptied weekly. However the number of bins and the service schedule is adjusted as necessary to accommodate the amount of use. Some sites have three bins and others have only one.

These bins serve the immediate area in which they are located, which is usually a village and the surrounding area. In 2012, these bins were placed in the following locations (additional details regarding the location are included in Table III-5):

Ansonia serving the village and Brown Twp.	(2-8 yd. bins serviced weekly)
Arcanum serving the village and Twin Twp.	(2-8 yd. bins serviced weekly)
Butler Township	(8 yd. bin serviced biweekly) <sup>4</sup>
Gettysburg serving the village and Adams Twp.	(2-8 yd. bins serviced weekly)
Hollansburg serving the village and Harrison Twp.	(8 yd. bin serviced weekly)
New Madison Village	(2-8 yd. bins serviced weekly)
New Weston serving the village and Allen Twp.	(2-8 yd. bins serviced weekly)
North Star serving the village and Wabash Twp.	(2-8 yd. bins serviced weekly)
Palestine Village	(8 yd. bin serviced biweekly)
Pitsburg serving the village and Monroe Twp.	(2-8 yd. bins serviced weekly)
Union City serving the village and Jackson Twp.	(8 yd. bin serviced biweekly)
Wayne Township	(8 yd. bin serviced weekly)
The Village of Wayne Lakes (added in 2013)	

The bins are owned by Rumpke and the material is transported to the Rumpke MRF in Dayton for sorting and processing. The Darke County Solid Waste Management District pays for the service. The local village and township governments and/or local businesses provide suitable sites for the bins.

*Responsible entity for drop-off program:* The Darke County Solid Waste Management District is responsible for providing the program for the residents of the District. Rumpke Waste, Inc. provides the equipment, collection and processing service. In most cases a local government provides the site and helps promote use of the bin. Some bins are on private property.

*Service area benefit:* The service area is the village and surrounding township or rural area in which the bin is located. However, it should be noted that residents do not always use the bin that is closest to their home. Traffic patterns are important. Bins that are located on major routes or in areas near popular shopping and employment destinations make it convenient for commuters to combine recycling with travel to work or other activities.

*Materials to be recycled:* The District funded drop-offs collect the “Rumpke Mix,” which is all colors of glass bottles and jars, aluminum, steel (tin), and aerosol cans, #1, #2 and #6 plastic containers (natural and colored), newspaper, mixed paper, magazines, phone books, regular and coated paperboard cartons, and corrugated cardboard.

*Future recovery rates:* Recycling from the drop-offs is not measured separately, it is mixed with recycling from curbside and commercial collections. Future recovery rates are addressed at the end of the residential/commercial recycling discussion in Chapter 5 of this plan following the discussion of planned programs.

*Other Multi-Material Recycling Drop-off Programs* *Other Multi-Material Recycling Drop-off Programs:* In addition to the multi-material drop-off bins supported by the Darke County Solid Waste Management District, Rumpke Recycling and Transfer Facility provides a multi material

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4 biweekly in this Plan means every other week

drop-off box at the Rumpke Transfer Facility on Jaysville -St. Johns Road on the outskirts of Greenville. It is open 24 hours a day, seven days a week and accepts the “Rumpke Mix.” It serves primarily the Greenville area, but is used by people bringing waste to the transfer facility from all over the county.

Rumpke is the responsible entity for this program, but the entire District benefits from the availability of this drop-off which is convenient for residents and businesses bringing waste to the transfer facility. This drop-off is listed in the “Where to Recycle” publications provided by the District. Since the District has no direct control over whether or not this site is available, it is not included in the calculations for access. However, since the material collected at this site is reported with the other material collected by Rumpke from curbside and the District drop-off sites, the material collected at this site is included in the future recycling calculations.

The Village of Versailles supplements the Village residential curbside recycling program with drop-off using two compartmented recycling trailers. One is available near the Village Service Garage and one is near the Versailles School District Board of Education offices. They are on opposite ends of Center Street. The Village is responsible for the program, which collects glass bottles and jars, aluminum and steel (tin) cans, #1 and #2 plastic (natural and colored) containers, newspaper, mixed paper, magazines, phone books, and corrugated cardboard. The drop-offs are open 24 hours, 7 days a week. The amount collected is reported to the District along with the amount collected at curbside annually.

Collection Programs for Limited or Single Materials: The following programs provide collection opportunities for one or more materials. They are aimed primarily at the residential recycler and supplement the curbside and multi-material drop-off programs. Each program is described briefly.

Ansonia Boy Scouts hold a semi-annual newspaper drive. The Scouts also provide year around storage for paper and do some door-to-door newspaper collection. The program serves primarily the Ansonia area.

Osgood Paper Recycling Monthly Drive (also known as Northern Darke County Recycling) is held the first Saturday of every month at the Osgood Community Park. It is sponsored by a non-profit organization and collects newspaper, magazines, mixed paper, paperboard, phone books, and corrugated cardboard. It serves primarily northern Darke County including Osgood.

Wayne Lakes Village collects aluminum cans primarily from residents of Wayne Lakes at a drop-off site near the entrance to the Wayne Lakes area.

Goodwill Industries, Christina’s Consignments, and The Store accept clothing and used housewares for resale. Drop-boxes for clothing and accessories bearing the Special Olympics logo are scattered around the Greenville area. The drop-off containers are a cooperative project between Special Olympics and Ohio Mills, a clothing and textile recycler. Information

regarding locations for the stores and the contact for the Special Olympics boxes is included in Table III-5.

The scrap yards and processors listed in Table III- 5 serve primarily commercial and industrial generators and will be discussed later in this Chapter under the headings for Commercial and Institutional Recycling and Industrial Recycling.

District Collection Events for Difficult to Manage Materials: In 2012, the District sponsored several events to assist residents, and in some cases, small businesses, municipalities and townships, to recycle materials that are difficult to manage.

**Appliance Recycling Day:** Appliance Recycling Day was held on May 31, 2012. 3.93 tons of appliances were recycled. The Darke County Solid Waste District and 1 Shot Services in Bradford teamed up to provide the event. Items accepted included refrigerators, washers, dryers, dishwashers, air conditioners, stoves, dehumidifiers, freezers, and furnaces. All CFC (Freon) removal and recycling was be done free of charge for any Darke County Resident. The event began at 9 am and continued until noon. Due to the success of the 2012 event, a similar event was held on March 23, 2013. I Shot Services partnered with the District again, but the event was moved to the Darke County Fairgrounds.

**Electronics Recycling Day:** After collecting 185,000 lbs. of electronics in one day in two different barns on the Darke County Fairgrounds in 2008, the Darke County Commissioners and district staff decided to make electronics collection and recycling an annual event. The 2012 event was held on May 24. The event is free to any Darke County resident or business. In order to avoid long lines and to be properly prepared, the District required preregistration. 83.64 tons of material was collected. The contractor for the event was Accurate IT Services from Columbus, Ohio. The 2013 Electronics Collection was held on May 23.

**Shred Day:** The Darke County Solid Waste District teamed up with Mercer Savings Bank to host a Shred Day. This event was free to the public. Paper shredding and recycling were offered from 9:00 a.m. to noon on June 2, 2012. The event was held at the Darke County Fairgrounds. 6 tons of paper was shredded by the contractor, Confidential Document Shredding. The event was repeated on June 1, 2013.

**Tire Collection Day:** The District held a tire collection/recycling day on September 20, 2012. The District worked with Rumpke. The District paid the tire collection fees so that residents could bring in passenger car tires at no charge. Preregistration was required and the limit was 25 tires per household. 99.14 tons of tires were collected. A similar event was held in 2013 on September 26. Passenger tires were again accepted at no charge. Semi tires and tractor tires were added to the tires that were accepted, but Rumpke's normal rate for these tires was charged

**Dry-cell Battery Collection Program:** The District sponsors an ongoing dry-cell battery recycling program. Collection boxes were placed at the following locations in 2012: Wal-Mart (service desk), Rest Haven (employees only), Village of Union City offices, Greenville ACE Hardware,

Brethren Home (employees only), Darke Co. Park District, Darke County Solid Waste office, Darke County Commissioners' office, Worch Library, Arcanum Hardware, Whirlpool (employees only), Eikenberry's, New Madison Public Library, Norcold, Inc., M & M Petrol & Pantry, Midmark (employees only), Wayne Hospital (employees only), Florida Production (employees only), Sutton's Super Valu, Birt's Store, New Weston, Village of Versailles, Versailles ACE Hardware, Heartland (employees only), St John Lutheran Church, Greenville. The batteries are processed by Battery Solutions in Michigan.

Commercial and Institutional Recycling:

The willingness and ability of commercial businesses and institutions to implement waste reduction and recycling programs continue to be influenced by the three factors that were discussed in the District 2007 Plan: technical information regarding how to set up programs, the availability of recycling services, and the financial cost or benefit of the program.

Since the early 1980's, the District has been active in providing education, training, and leadership for businesses and institutions in waste reduction and recycling. But, even though information about how to set up a program is readily available, there still are challenges. The biggest challenge to increasing commercial and institutional recycling continues to be that collecting recyclable materials, particularly paper and corrugated cardboard, from businesses and institutions, processing the material and transporting it to markets is not necessarily profitable. Small businesses, schools, non-profits, and government agencies that do not generate large volumes of material continue to have difficulty finding a service provider to pick up their recyclables for free or for a price that they are willing to pay. For that reason, the District makes the residential drop-offs available for the use of small businesses and is supportive of private sector programs that address this problem.

Following is a list of programs for commercial and institutional recycling that are operated by the District or by the private sector. These programs will be discussed again in Chapter V of this plan with additional information regarding the way the programs will be implemented during the planning period.

The Rumpke Paper Drop-off in central Greenville: Rumpke maintains a drop-off for all types of paper and cardboard in central Greenville at a location that is convenient for small businesses and government offices to drop-off all types of paper and cardboard. The drop-off is available 24 hours a day, seven days a week. There is no cost for using the drop-off and there is no charge to the District for this service.

School Recycling Program: The District, in cooperation with Rumpke, provides 6 yard recycling bins which are serviced weekly for Ansonia Local Schools, Anthony Wayne Schools, Franklin Monroe Local Schools, St. Mary's School in Greenville, Arcanum Butler Local Schools, Mississinawa Valley Local Schools, and Versailles Exempted Schools (2 bins). In 2013, Greenville City Schools joined the school recycling program.

**Self-reported Commercial Recycling:** Many large and small businesses in Darke County have active recycling programs and are willing to keep track of the amount recycled and report to the District. In 2012, local wholesale and retail businesses reported recycling 10,082.55 tons of material. (The businesses are listed in the “Residential and Commercial Recycling Data for 2012” table which is included in Appendix F of this Plan. The table also provides information about the type of material that was recycled by each reporting business or institution.) This recycling was accomplished by the reporting businesses without any specific intervention by the District. The reporting businesses worked with a number of waste collectors and recyclers. Some delivered the material to a recycling location and others utilized collection services.

**Commercial Recycling through MRF’s and Internal Supply Chains:** Many national and regional retail and wholesale businesses set up recycling programs which utilize internal company supply chains and/or regional recycling contracts. For several years, Ohio EPA has been working to retrieve recycling information from such businesses and to report information to solid waste districts for the stores/facilities within the individual districts. In 2012, recycling amounts for four large retailers were reported along with data from material recovery facilities. The total amount reported as recycled by the four retailers was 888.46 tons. Additional information is included in the Table labeled "Residential and Commercial Recycling data for 2012" in Appendix F.

**The Darke County Government Recycling Program:** The Darke County government agency recycling program collects ferrous and non-ferrous metals, mixed paper, corrugated cardboard, plastic #1 and #2, and wood and other recyclable items from county government facilities and operations including offices and maintenance facilities. Most of the material that is collected is included in the recycling amount reported by the Rumpke MRF.

**Responsible entity:** With the exception of the commercial drop-off provided by Rumpke and the school recycling bins, the recycling programs for commercial businesses and government and non-profit institutions are the responsibility of the individual business, institution or governmental entity. The District provides information and technical assistance to any entity that is interested in starting or expanding a recycling program. The District is responsible for managing the Darke County government office recycling programs.

**Service area of benefit:** The individual business or institution is the primary beneficiary.

**Materials to be recycled:** The bulk of the commercial materials recycled consists of cardboard, mixed paper and office paper, and wood pallets. The materials targeted for commercial sector recycling in the 2007 plan were corrugated cardboard, office paper, wood pallets, and aluminum cans. The materials that a business recycles depend upon the materials that are generated by the business and the available markets.

**Future recovery rates:** Future recycling rates will be discussed in Chapter V of this Plan in conjunction with the discussion of future planned programs.

**Recycling through in-district and out-of-district private scrap yards and brokers:** The private

recyclers that receive materials from the District are listed in Table III-5. Most of the out-of-district scrap yards that are listed in Table III-5 recycle industrial scarp. The In-district scrap yard, and several out-of-district scrap yards/recyclers, particularly Ohio Recycling, in Chickasaw, Ohio, and Richmond Recycling in Indiana receive material from residential, commercial, and industrial sources.

The District appreciates the important contribution made by private scrap yards in diverting recyclable material from disposal. Private scrap yards attract the materials that have monetary value. The District will continue to maintain a list of private recyclers which includes the materials accepted, location, business hours, and other pertinent information. The benefit, including in most cases payment for the recyclables, goes to the individuals and businesses that recycle materials.

**Rumpke Recycling Materials Recovery Facility:** The Rumpke Material Recovery Facility in Dayton is an important component of the curbside, drop-off and commercial drop-off recycling programs in Darke County. The material that is collected Through Rumpke's many programs in the District is either transported directly to this facility for processing or is dropped at the Rumpke Greenville Facility to be consolidated and transported to Dayton for processing. The Dayton material recovery facility has the equipment necessary to sort and process the materials to meet the needs of the markets.

**Yard waste diversion through yard waste composting and the field spreading of leaves:** The yard waste management and composting programs and facilities used in the reference year are listed on Table III-6.

In 2012, Greenville and Versailles had yard waste collection programs as part of the regular residential waste collection services. Yard waste from Greenville was collected by Rumpke. The materials were taken to Fitzwater Tree and Lawn Care for processing. In Versailles, yard waste is collected by the village and is composted at the village's registered Class 4 Composting Facility.

In 2012, the following villages reported that leaves were collected in the autumn and spread them on area farm fields: Ansonia, Arcanum, Gettysburg, New Madison, Palestine, Union City, and Wayne Lakes Village. Wayne Lakes operates a drop-off to which residents bring yard waste. The yard waste including brush is chipped on-site and used for landscaping.

Fresh Air Farms offers an opportunity for the District to actively encourage individual households and businesses in areas where there is not a yard waste collection program to collect and deliver yard waste to the facility in Union City instead of putting yard waste out for disposal.

The District promotes “don’t bag it”<sup>5</sup> and backyard composting through the District’s education programs for adults and youth. Brochures and flyers are distributed at the Darke

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5 Leaving grass clippings on the lawn instead of bagging them up for disposal.

County Fair and at other public events. Information is posted on the District website and is always available at the District office.

Responsible entity: Local governments are responsible for programs for separate collections of yard waste and/or leaves. The District anticipates that at least one privately operated yard waste composting facility will be available to the public throughout the entire planning period. It is the responsibility of residents to collect and manage their own yard waste utilizing the public and private services that are available or by backyard composting. The District realizes that residents in rural areas often apply yard waste on their own gardens or fields or make arrangement with neighbors for field spreading of yard waste. This practice is an acceptable diversion method as long as only yard waste, free food waste, plastic bags, paper, and other materials that may attract pests or constitute litter are not included.

Materials recycled: Yard waste including grass clippings, garden debris, leaves, and brush.

Service area: The service area is the city or village for municipal collection programs. The entire county is the service area for yard waste management education programs. Fresh Aire Farms, and Fitzwater are upon to all Darke County residents who are willing to deliver yard waste prepared to the requirements of the facility during time posted for receiving material.

Household Hazardous Waste: The District held a household hazardous waste event on October 20, 2012, from 8:00 am to noon at the Darke County Fairgrounds. The event was in cooperation with Darke County Homeland Security. It was free to Darke County residents only. The materials that were accepted were: paint (oil and latex), pool chemicals, gasoline and kerosene, household cleaners, antifreeze, varnishes and stains, mercury, turpentine, fertilizers and pesticides, and prescription medications. The contractor for the event was Clean Harbors Environmental Services. The Event was held on October 26, in 2013.

In addition, to this event, the District provides information on the appropriate management of HHW on the website and makes a comprehensive brochure on the topic available at events and at the District office.

## *2. Industrial Waste Reduction and Recycling*

Table IV-7(A) shows the total of all the documented industrial recycling in the reference year, 2012. Although waste reduction programs are being implemented by many industries as part of over-all programs to be efficient and competitive, waste reduction is often difficult to quantify. In addition, for reporting purposes only waste reduction that results from new practices is included. In 2012, no new waste reduction efforts were reported so no waste reduction is listed.

The following table lists only documented industrial recycling for 2012. Note: Only the net total recycled was reported by industries on the industrial surveys.

**Table IV-7.A.****Industrial Recycling in the Reference Year, 2012**

	<b>Received</b>	<b>Residual</b>	<b>Total</b>
Waste reduction documented on industrial surveys.			0
Recycling reported on industrial surveys			14,786
Incineration			0
Yard waste composting			0
Resource Recovery			0
<b>Total Industrial Waste Reduction and Recycling</b>			<b>14,786</b>

Industry waste reduction and recycling programs are extremely varied depending upon the type and size of the industry, the waste stream it generates, and the availability of haulers and recyclers to assist the industry in the collection and marketing of materials. In general, the same types of programs and assistance are offered to commercial businesses and to industrial waste generators.

**Table IV-7.B. Reference Year Recycling by Material Type**

<b>Material</b>	<b>Tons Reported Recycling</b>	<b>Tons Reported Waste Reduction</b>
Batteries	1	
Glass	0	
Ferrous Metals	5,178	
Non-ferrous Metals	229	
Cardboard	2,249	
Paper (all types)	42	
Plastic ( all types)	5,856	
Wood & wood pallets	1,229	
Non-hazardous, solid chemicals	2	
<b>Total all materials</b>	<b>14,786</b>	<b>0</b>

The larger Darke County manufacturers manage waste reduction and recycling programs effectively with virtually no assistance or intervention by the District. However small industries

may have the same problems and concerns as small businesses. In the 2007 Solid Waste Management Plan Update, the District committed to do the following:

Provide staff support to facilitate the activities of the Environmental Council.<sup>6</sup> Since the agenda is participant driven, no minimum number of meetings or specific topics will be required.

Provide technical assistance for business and industry. District staff provide information and assistance to business and industry on waste reduction and recycling issues. District staff will serve as a resource link with other agencies and experts in the field.

The District will maintain a list of markets for commercial and industrial recyclables. At least one of the newsletters produced each year by the District will include information that will be of interest to business and industry and will be used to communicate the availability of technical assistance from the district to the target audience.

The District will contact business and industry through the annual waste reduction and recycling surveys and use the surveys to identify needs and opportunities for additional assistance or training. The District will report total waste reduction and recycling in the Annual District Report and will report findings of need for assistance and training and the steps implemented or planned to meet identified needs.

The District continues to meet all of these commitments with two exceptions. The District's website has replaced the District newsletter. The website contains recycling, waste reduction, and composting information useful and relevant to all types of waste generators. And, as of 2013, the Environmental Council has disbanded. The Council members and the Solid Waste District Policy Committee felt that the Council's Mission had been accomplished, and the members did not feel the need to continue meeting.

The annual waste disposal, recycling, and waste reduction survey assures that the District is in contact with all of the manufacturers and most of the commercial businesses in the District at least once a year.

### *3. Recycling, composting and waste reduction education and awareness*

The Darke County Solid waste Management District has a well-developed infrastructure to facilitate recycling for residential, commercial, and industrial waste generators. However, the infrastructure is of no value if it is not used. Therefore, education and awareness activities continue to be important. The District provided the following education and awareness programs in 2012:

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6 The Environmental Council, for which the District provided staff support through 2012, is a voluntary membership organization made of members from business, industry, education, government, and non-profit organizations which share an interest in environmentally sound management practices. The agenda of the Council is directed by the needs and interests of the participants.

Website: The District maintained a website, [www.co.darke.oh.us/solidwaste](http://www.co.darke.oh.us/solidwaste). This on-going project includes up-to-date information about recycling and lists all of the programs and services of the Solid Waste District. The District also maintains a Facebook page with information about recycling and waste reduction and links to information about District activities.

Educational Materials: in 2012 and continuing to the present the District makes a number of publications available to the public including the following: *The Darke County Guide to Recycling*, which is a comprehensive guide to where, when, and how to recycle almost anything in Darke county. The guide is available in a printed form and on the website. *Composting in Darke County* is a beginners' guide to backyard composting. *Household Hazardous Waste* provides information about the proper handling of materials that are considered to be household hazardous waste and recommendations on alternatives to these materials. Several pamphlets provide information about special District collection events and give general information regard the proper handling of difficult to manage materials. This include *Tire Recycling* and *Battery Recycling*. The District also disseminates useful information via fact sheets. Examples are the OEPA fact sheet on Disposal of Household Generated Sharps, Proper Disposal of Prescription Drugs published by the Office of National Drug Control Policy, Information of CFL bulb recycling taken from US EPA publications, and Guidelines for Disposing of Leftover Paint. These publications are available at the District office and are made available at the Darke County Fair and other community events.

Speaking and Education Sessions for Adults and Children: In 2012, the District Director and the District Administrative Assistant spoke to a local garden club and the BPW about recycling opportunities in the county. The District held a composting workshop in conjunction with the Soil and Water District. District presented recycled craft programs involved 52 preschoolers. Also, the District Director works with area 4-H.

The District maintains a resource library for teachers and others in the community that want additional information about waste management, recycling and waste reduction.

The District has a display at the Darke County Fair which has information about all of the District programs. In 2012, 3,500 brochures about where and how to recycle in Darke County were distributed at the Fair.

The District works to be sure that District activities and programs are well publicized. The special collection events, the Annual Trash Bash, events related to Earth Day and other District programs are occasions to inform the public about the Waste District, the resources it makes available, and to generally promote recycling and waste reduction through radio interviews and news and feature stories in local daily and weekly newspapers.

Other Programs and Activities: The District also undertakes some activities that are not directly related to the recycling and waste reduction programs, like litter prevention and clean-up activities and support for Health Department solid waste monitoring and enforcement

activities. The “other” activities that the District plans to implement during the planning period and how they relate to the reference year activities of the District will be discussed in Chapter V of the Plan.

#### F. Total Waste Generation Based on Historical Trends

Table IV-8 shows the amount of waste disposal and recycling reported for 2005, the reference year for the last Plan Update, and for each year up to 2012, the reference year for this Plan. The amount of waste disposal and recycling in each waste category and the total for each year fluctuates up and down, but considering all of the variables that may effect this data, the fluctuations are not extreme. Notice the note for Table IV-8. The amount of industrial disposal in 2005 was adjusted to rule out a one-time event—the disposal of more than 17,000 tons of contaminated soil. This was done in order to compare industrial waste generated by manufacturers for 2005 with the amount generated in other years. The amount of both industrial disposal and industrial recycling has decreased over the years. This is probably due to two factors--improved waste reduction programs and a decrease in the number of manufacturers operating in the District from 2005 to 2012.

The District is encouraged by the fairly consistent decrease in residential/commercial disposal over the years. The decrease in 2008, 2009 and 2010, is consistent with national disposal figures which decreased due to the economic downturn beginning in 2008. However, the amount is not going back up even though the District population is remaining quite stable. While residential/commercial disposal is going down, recycling is going up.

**Table IV-8.** Total Waste Generation Based on Disposal Plus Waste Reduction

Year	Res/Com Disposal	Res/Com Recycling	Res/Com YW Composting	Res/Com Generation	Industrial Disposal	Industrial Recycling	Industrial Generation	Exempt Waste Disposal	Total	Res/Com Recy Rate	Ind Recy Rate
2005 (Note 1)	40,082	12,924	7,244	60,250	4,322	19,115	23,437	1,805	85,492	33%	82%
2006	38,404	8,058	5,663	52,125	5,396	19,005	24,401	4,243	80,769	26%	78%
2007	38,742	8,328	5,797	52,867	4,450	21,274	25,724	2,448	81,039	27%	83%
2008	35,768	8,288	4,727	48,783	5,164	15,036	20,200	3,913	72,896	27%	74%
2009	34,067	5,631	5,434	45,132	1,161	13,741	14,902	1,621	61,655	25%	92%
2010	32,424	13,133	2,663	48,220	2,663	12,598	15,261	2,991	66,472	33%	83%
2011	35,337	13,775	3,651	52,763	1,309	9,212	10,521	3,769	67,053	33%	88%
2012 (Note 2)	34,788	19,372	5,760	59,921	1,009	14,786	15,795	3,589	79,305	42%	94%
<i>2012 adjusted</i>	<i>33,121</i>	<i>19,372</i>	<i>5,760</i>	<i>58,254</i>	<i>2,675</i>	<i>14,786</i>	<i>17,461</i>	<i>3,589</i>	<i>79,304</i>	<i>43%</i>	<i>85%</i>

Note 1: Total industrial waste disposal for 2005 was reported as 21, 546 tons. That included disposal of 17,224 ton of contaminated soil. This was a one-time occurrence. The amount listed here does not include the contaminated soil so that it shows an amount of industrial recycling that is comparable to other years.

Note 2: Residential/commercial waste data as reported to Ohio EPA on the landfill and transfer facilities data reports.

## G. Reconciliation of Waste Generation

### Adjustments to residential/Commercial and Industrial waste disposal:

As noted above, the amount of waste disposed of in landfills has generally decreased over the past eight years. The one area that has fluctuated the most is industrial disposal. While it is likely that part of the decrease in disposal is tied to a decrease in industrial production, the amounts in 2010 and 2012 are extremely low. The industrial waste surveys for 2012 included reported industrial waste disposal that exceeded the amount reported as received at landfills. We believe the industry reported numbers are accurate. After examining the evidence, the District believes that some industrial waste is entering disposal facilities as residential/commercial waste. This is very likely because waste haulers often collect both commercial and industrial waste on the same route with the same truck. It is likely that mixed loads are not designated as industrial waste. Therefore, the District is using 2,747 tons as the amount of industrial disposal.

Note regarding commercial recycling: In 2012, a large wholesale distribution company reported recycling more than 7,900 tons of wood and wood pallets. This is an unusually large amount even for this type of business. Although the amount was verified, the District was unable to obtain additional information as to whether or not this was likely to continue. Therefore, future waste recycling and reduction calculation will be adjusted to show the possibility that this was a one-time occurrence. This issue will be discussed in Section H, Waste Composition, which follows and in the discussion of future residential/commercial recycling projections in Chapter V of this Plan.

Table IV-9 has been omitted. No further adjustments were made and the total waste generation figures that are used in this Plan remain the same as those presented in Table IV-5.

## H. Waste Composition

### 1. *Residential and Commercial Waste Composition*

The residential/commercial waste generation for the reference year was calculated by adding the amount of materials reported as recycled and composted to the amount reported as landfilled. The District has, as in past Plans, chosen to apply the percentages of the major types of materials in the residential/commercial waste stream for the United States to the total waste generation of the District. The District has chosen this method as an alternative to a waste sort. Waste sorts are time consuming and expensive. Although a waste sort might provide more accurate information regarding the residential/commercial waste stream in Darke County, it is unlikely that the results would reveal much that would be of practical value in revising the overall approach the District takes to residential and commercial recycling. However, the District also realizes that applying national figures to such a small generation area can pose problems. One particular problem has arisen for the reference year. Darke County is the home of a large wholesale distribution company. In 2012, the facility reported recycling 7,900 tons of wood pallets. In a large metropolitan area, this amount of material would be a very small percentage of the total of residential/commercial waste generation because it would be

"diluted" by the generation from large numbers of residents and businesses. However, this single generator in one rural county somewhat overwhelms the other residential and commercial generation and skews the results when national waste generation percentages are applied to total waste generation. In order to demonstrate this effect, two tables are presented, Table IV-10.A. and IV-10.B. Table A uses total residential waste generation calculated by adding the adjusted residential/commercial disposal and all reported recycling. Table B uses an adjusted recycling figure with the wood recycled from the one wholesale distribution facility eliminated from the calculation. The results are obviously quite different. Table B probably provides a more accurate comparison of the residential/commercial recycling rates in Darke County as compared to national recycling rates.

The percentages for materials in total waste generation that are used in Table IV-10.A, and B. are from *Municipal Solid Waste in the United States: 2011 Facts and Figures*, United States Environmental Protection Agency, publication EPA530-R-13-001, May 2013, p. 40, Table 1. The percentage of total waste generation that was recycled by material type figures are from the same publication, p. 6, Table ES-2. The full publication is available at [www.epa.gov](http://www.epa.gov).

There will be additional discussion of the composition of the residential/commercial waste stream in the District in Chapter V as part of the discussion of future recycling rates.

**Table IV-10.A.****Estimated Composition of the Residential Waste Stream for the Reference Year**

<b>Material Category</b>	<b>Percent of Total Waste Generation National Percentages</b>	<b>Projected Tons in District Waste</b>	<b>Amount of Reported as Recycled</b>	<b>Percent Reported as Recycled</b>	<b>National Percent Recovered</b>
Glass	4.6%	2,680	371	13.9%	27.6%
Metals (Ferrous and non-ferrous)	8.8%	5,126	3,873	75.6%	34.2%
Paper (all types)	28.0%	16,311	4,969	30.5%	65.6%
Plastic (all types)	12.7%	7,398	140	1.9%	8.3%
Rubber, Leather and Textiles	8.2%	4,777	1,085	22.7%	16.1%
Food	14.5%	8,447	234	2.8%	3.9%
Wood (includes wood pallets)	6.4%	3,728	8,096	217.1%	14.8%
Yard Waste	13.5%	7,864	5,760	73.2%	57.0%
Other	3.3%	1,922	603	31.3%	27.9%
Total	100.0%	58,254	25,133	43.1%	34.7%

**Table IV-10.B.**

**Estimated Composition of the Residential Waste Stream for the  
Reference Year  
Adjusted to Percentages with Adjustment for Wood from a Single  
Source**

<b>Material Category</b>	<b>Percent of Total Waste Generation National Percentages</b>	<b>Projected Tons in Adjusted Total District Waste</b>	<b>Amount of Reported as Recycled Less 90% of Wood from a Single Source</b>	<b>Percent Recycled Using Adjusted Total</b>	<b>National Percent Recovered</b>
Glass	4.6%	2,316	371	16.03%	27.6%
Metals (Ferrous and non-ferrous)	8.8%	4,431	3,873	87.41%	34.2%
Paper (all types)	28.0%	14,099	4,969	35.25%	65.6%
Plastic (all types)	12.7%	6,395	140	2.20%	8.3%
Rubber, Leather and Textiles	8.2%	4,129	1,085	26.29%	16.1%
Food	14.5%	7,301	234	3.21%	3.9%
Wood (includes wood pallets)	6.4%	3,223	986	30.59%	14.8%
Yard Waste	13.5%	6,798	5,760	84.74%	57.0%
Other	3.3%	1,662	603	36.26%	27.9%
Total	100.0%	50,354	17,233	34.22%	34.7%

## 2 Industrial Waste Composition

The composition of the industrial waste generated in 2012 is shown in Table IV-11. All of the information regarding waste composition is from industrial surveys. It should be noted that most of uncharacterized waste was listed on the surveys as mixed waste sent for disposal. Most of the industries that reported significant amount of mixed waste for disposal also reported significant amount of recycling. Although some materials in this mixed waste could, perhaps, be segregated and recycled, most of it is probably material for which is contaminated or for which there is not presently viable recycling option. The survey asks industries to list material that they would like to recycle if there was a market. In the past industries have listed material that made up significant parts of the waste stream. In some cases, markets have been identified for those material. For the past two years, very little has been listed.

**Table IV-11.** **Estimated Industrial Waste Composition in 2012 Using Data Reported by Industries**

Material	Tons Reported Recycling	Tons Landfilled	Total Generation
Batteries	1		1
Glass	0	142	142
Ferrous Metals	5,178	7	5,185
Non-ferrous Metals	229		229
Cardboard	2,249	39	2,288
Paper (all types)	42	41	83
Plastic ( all types)	5,856	52	5,907
Wood & wood pallets	1,229	29	1,258
Non-hazardous, solid chemicals	2		2
Food		4	4
Yard waste		1	1
Sludge		155	155
Mixed waste		2,206	2,206
Total all materials	14,786	2,675	17,461