

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

This section of the plan contains estimates of District population, waste generation, waste reduction and waste composition for the reference year 2013.

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

**Table IV-1**, Reference Year Population and Residential/Commercial Waste Generation, presents District population and estimated residential/commercial waste generation for the year 2013. Source of the population data is the "2013 Population Estimates for Ohio Counties, Cities, Villages and Townships" from the U. S. Department of Commerce, Bureau of the Census, as prepared by the Ohio Department of Development, Office of Strategic Research (See Appendix H).

Ohio law requires the entire population of municipalities and villages located in more than one solid waste district be added only to the district containing the largest portion of the jurisdiction's population. Under this requirement, the entire City of Vermilion, including the portion located in Erie County, is part of the Lorain County SWMD, the entire City of Bellevue including the portion that is in Erie County is in the Ottawa-Sandusky-Seneca Joint Solid Waste Management District and the entire village of Milan, including the portion in Huron County is part of the Erie County SWMD. After subtracting the population of the City of Vermilion and the portion of the City of Bellevue and adding the population of the Village of Milan that resides in Huron County, the District's population for 2013 is 71,524.

To estimate the amount of commercial/residential waste generated in 2013, the District used the generation rate of 4.40 pounds per person per day (ppppd), obtained from "Municipal Solid Waste in the United States: 2013 Facts and Figures", U.S. EPA (see Appendix H). Using this figure, the District estimates generation of commercial/residential waste in 2013 was 57,431 tons in **Table IV-1**.

However the District will be using historical data to estimate the amount of commercial/residential waste generated in 2013. The District used historical data generated from the "Ohio Solid Waste Flows to Landfills & Incinerators in Ohio – 2013". Using this historical data, the District estimates generation of commercial/residential waste in 2013 as 74,401 tons as seen in **Table IV-9**.

##### **B. Industrial Waste Generation**

To estimate the amount of industrial waste generated in 2013 by NAICS and SIC as required in **Table IV-3**, the District utilized the results of its March, 2014 survey of District industries to calculate a waste generation rate per employee for each NAICS category. The District surveyed 119 District industries identified through the Harris Directory, an online resource called Manta, and Erie County Economic Development Office. Of the 119 industries, 81 responded to the survey. (See Appendix F for a

summary of survey responses.) Of the 81 responses, 33 provided both recycling and disposal data, i.e. their total waste generation. For those industries reporting waste disposal in cubic yards, the calculation:

$$\text{Cubic yards} \times 1.5 = \text{Tons}$$

The conversion is used by standard engineering practices when measuring soils.

The 81 responding industries were grouped by NAICS, and the waste generation rate per employee was calculated for each NAICS. **Table IV-3** summarizes the information by NAICS for the responding industries on the left side of the table.

The non-responding industries and those responding industries that did not provide disposal data were also grouped by SIC. The reason they were grouped by SIC was due to SIC having generation rates already established in Appendix JJ of the 3.0 Format. In accordance with the OEPA recommendation found in Appendix JJ of the “District Plan Format Version 3.0”, generation rates from table JJ-2 “Ohio Industrial Waste Generation Rates by SIC category (data as of 2/23/93)” were applied to the non-responders for the following SIC codes: 14, 27, 34, 36, 39, and 87 due to the fact that there was not enough sampling to replicate any actual numbers. SIC 14 and 87 were outside the parameters for the chart and the average pounds per person rate was used for those two industries. Once the total weight was calculated by SIC it was then moved into the proper NAICS and totaled. The right side of **Table IV-3** summarizes the data for non-responding industries and estimates the waste generation by SIC.

Using the above calculations, total estimated industrial waste generation for the reference year as 289,699 tons in **Table IV-3** which included waste landfilled/recycled that answered the survey and waste landfilled/recycled estimates on non-respondents.

However the District will be using historical data to estimate the amount of industrial waste generated in 2013. The District used historical data generated from the “Ohio Solid Waste Flows to Landfills & Incinerators in Ohio – 2013”. Using this historical data, the District estimates generation of industrial waste in 2013 as 10,374 tons as seen in **Table IV-9** which will be used throughout the planning period.

#### C. Exempt Waste

The District disposed of 24,931.33 tons of construction and Demolition Debris and 20.64 tons of unknown waste in 2013 as reported in “Ohio Solid Waste Flows to Landfills & Incinerators in Ohio - 2013”, Ohio EPA. **Table IV-4** shows this amount as 24,952 tons of Total Exempt Waste Generation in Tons per Year, and calculates a generation rate of 1.91 pounds per person per day based on a population of 71,524.

#### D. Total Waste Generation



**Table IV-5** summarizes the waste generation estimates developed in Tables IV-1, IV-3 and IV-4 into a total waste generation estimate of 372,082 tons for the reference year 2013. Using this estimate, the District's estimated total waste generation rate is 28.51 pounds per person per day.

#### **E. Reference Year Waste Reduction**

The source of the waste reduction data in **Table IV-6** and **Table IV-7** is the Annual District Report for calendar year 2013. To compile the data in the ADR, the District conducted a survey in November 2013 to be turned in to the District by March 2014 of all District recycling programs, solid waste haulers, the District's publicly available compost facility, political subdivisions collecting leaves and yard waste, and industries. A summary of the waste reduction strategies and programs operating within the District in the reference year, and their results, is presented below. The results of the 2013 Annual District Survey can be found in Appendix F.

Responses were carefully checked to ensure that materials were reported by only one entity, or, if reported by more than one entity, were counted only once. A discussion of this process for each program listed below follows Table IV-6.

#### **Residential/Commercial Sector Waste Reduction**

**Table IV-6** presents the district's residential/commercial waste reduction for 2013 as reported in the Annual District Report based on survey results. The District documented 29,255.82 tons of residential and commercial recycling in 2013 as follows:

<b>Program</b>	<b>Tons</b>
Non-Subscription Curbside Recycling: City of Huron	850.43
Subscription Curbside Recycling: Erie County	617.88
District Operated Drop-Off Recycling Locations	529.75
Community Operated Drop-Off Recycling Locations	386.15
Electronics Collection	18.98
Community Grants	43.00
Battery Recycling Program	3.78
Lead Acid Battery Recycling	0.10
Household Hazardous Waste Collections	14.55
Commercial Surveys	18,647.94
School Recycling	25.70
Yard Waste/Compost/Food Waste	8,660.70
Tire Recycling Program	22.22
<b>Total</b>	<b>29,255.82</b>

#### ***Existing Residential/Commercial Waste Reduction activities***

***Non-Subscription Curbside Recycling***

The City of Huron contracted for curbside recycling with trash collection for all residences (7,045) within the city limits. Materials, including corrugated cardboard, magazines, newspapers, glass containers, steel and aluminum containers, and plastic, are collected and processed by F.S.I. Disposal, Clyde, Ohio under the current contract. All residents are invoiced monthly for the service on their water bill.

The District entered a contract with the City of Huron to provide a subsidy for this program in 2000 of \$1.49 per capita, or \$10,475, per year for three years. This amount is the approximate per capita cost for the District to provide drop-off boxes in other areas. The intent of the subsidy was to assist Huron residents to pay for curbside recycling, or to provide them additional recycling opportunities.

The strengths of Huron's curbside program are the high level of access (100%) and participation (1,443,060 pounds of material collected in 2013 divided by 2,642 households equals 546 pounds recycled per household per year), accurate documentation of amount collected, and attractive per household cost due to route density (See Appendix H). The program is very popular with Huron residents, and the likelihood is high that the city will continue curbside recycling into the future. There are hopes that the curbside recycling program in the City of Huron will extend into Huron Township in the future.

***Subscription Curbside Recycling***

Although subscription curbside recycling services are available throughout Erie County (see Appendix H), no other political subdivision in the District provides, franchises, or contracts for waste hauling or curbside recycling for its citizens. Republic Waste Services, U.S. Rubbish, and Ruffin Refuse reported a 1,183 tons of recyclables collected from subscription curbside customers in 2013.

**Erie County Curbside Recycling Initiative**

The Erie County Solid Waste Management District Policy Committee set the following two goals for the 2010 District Plan:

1. Fifty percent of the population in Erie County participating in a curbside recycling program by 2015, five years after the plan is approved.
2. Seventy-five percent of the population in Erie County participating in a curbside recycling program in 2020, ten years after the plan is approved.

The District did not reach the 2015 goal; however, the District did increase curbside recycling opportunities to the residents of Erie County by 28%.

The District is planning to reach the access goal for recycling services to be provided to 90% of the residential population by 2016 by updating the District's Service Provider Agreements (Appendix J) and the Solid Waste Rules to require all trash hauling service providers in Erie County to provide non-subscription curbside recycling. If non-



subscription curbside recycling results in unreasonable rates and charges for trash hauling service, as determined in the sole discretion of the District, the District reserves the right to amend the Service Provider Agreements to require subscription curbside recycling instead.

The District will continue to encourage Erie County Communities to contract

### **Compliance with the Erie County Curbside Recycling Initiative**

Under the authority granted by Revised Code section 343.01(G)(2) and the District's Rules, haulers that provide trash service to the residents of Erie County must enter into a Service Provider Agreement with the District. The updated Service Provider Agreement will require that haulers:

- Offer curbside trash hauling service;
- Offer non-subscription curbside recycling services to all residents who obtain curbside trash hauling service;
- Collect curbside trash and curbside recycling in separate containers;
- Provide the District with Quarterly Reports on forms prescribed by the District;
- Comply with any other District Rule set forth in Appendix I, or as later amended by the District.

Non-compliance with the District's Curbside Recycling Initiative may be enforced as a violation of the District's Rules in accordance with Revised Code section 343.99, or as a breach of contract of the Service Provider Agreement.

### ***Erie County SWMD Drop-Off Program***

In 2013, the District operated six drop-off recycling locations in Erie County. All of the drop-off recycling locations were stationed in Townships. One of the drop-off recycling locations is positioned in front of the Erie County Landfill. This location services both residents and commercial businesses. Each site was unmanned and available to the public 24 hours a day, seven days a week. In 2013, a total of 529.75 tons of materials was collected from the five drop-off recycling locations.

Each site was operated in cooperation with the local political subdivision which was responsible for overseeing the site. The District contracted with private hauler/recycles for the removal and processing of the material. Material collected included corrugated cardboard, newspaper, mixed paper, magazines, steel cans, aluminum cans, glass containers, and plastic containers (plastic #1-#7 no Styrofoam).

Benefits of the District's drop-off recycling program include convenient access to at least one drop-off for all residents of the District, a large number of materials recycled, strong partnerships between the District and host communities, and accurate documentation of amount collected. In addition, by utilizing private hauler/processors to collect and

manage the material, private industry is motivated to remain in the business of recycling, as opposed to abandoning responsibility for recycling to the public sector.

On the downside, however, the cost of the drop-off recycling program is borne solely by the District, and the cost to the District of operating the drop-off recycling program in 2013 was \$93,197.84 based on January – December monthly invoices. The District's Quarterly Report is based on invoices paid during January – December and may include invoices from the previous year.

Once the District implements the updated Service Provider Agreements the only drop-off location the District will have expenses for will be the Erie County Sanitary Landfill Location. The District will spend \$93,197.84 in 2016 and from 2017 moving forward the District will take the total cost of the Sanitary Landfill Location from 2013 at \$18,511.68 and projects the cost to increase 5% throughout the planning period.

From the approval of the previous Plan in 2010 through the present the District worked with communities to implement their own curbside recycling and/or drop-off recycling program. A few of the communities tried to implement curbside recycling programs, but the public and small hauler backlash made the programs politically impossible to implement. The District went out for bid for a county-wide curbside recycling program, but again the public and small hauler backlash made the programs politically impossible to implement. The only hauler to submit a bid was Republic Waste Services. Their bid came in at \$120 per quarter, \$65 more than what the average cost for trash pick-up alone.

The District worked out a plan with Ohio EPA and the Erie County Haulers to implement county-wide curbside through the current Service Provider Agreements. Service Provider Agreements and the Solid Waste Rules are updated to state if you provide curbside trash hauling services in Erie County that you must provide curbside recycling at no additional cost. The Solid Waste Rules are updated to state how the District will enforce the Service Provider Agreements.

### ***Community Operated Drop-Off Program***

In 2013, three political subdivisions operated their own drop-off recycling locations: Vermilion Township, Margareta Township, and two (2) sites in the City of Sandusky. Each site was unmanned and available to the public 24 hours a day, seven days a week. In 2013, 386.15 tons of materials were collected from the three drop-off recycling locations.

Each site was operated by the local political subdivision which was responsible for overseeing the site. The political subdivision contracted with private hauler/recycles for the removal and processing of the material. Material collected included corrugated cardboard, newspaper, mixed paper, magazines, steel cans, aluminum cans, glass containers, and plastic containers (plastic #1-#7 no Styrofoam).

### ***Erie County SWMD special collections***



### ***Scrap Yards***

The District promotes the two scrap yards operating in the District for all appliances. Ever since scrap prices went up in 2010 the material collected is not enough to pay for the expenses incurred by the District. All the appliance tonnages are captured in the annual survey (if the scrap yard returns them, as they have been hit or miss the past five years).

### ***Electronics***

In 2008 Dell Inc., and Goodwill Industries Inc. introduced the "Reconnect" Program. "Reconnect" is a free drop-off program to recycle unwanted computers and computer equipment at any one of the SBA Goodwill Industries Inc. locations, two of which are located within the District (Perkins Twp. and City of Huron). The information has been disseminated through the District's webpage, recycling guide, and the water bill distributed to customers of Erie County water. The District will continue to conduct an annual county-wide collection for electronics in conjunction with the Appliance Round-Up. These totals are included in the Annual District Report as Goodwill Industries provides the District with an annual survey.

The District partnered with The Volunteer Center of Erie County to provide an ongoing collection of all electronics with the exception of televisions and monitors (anything with a cord). In addition to their ongoing program, The Volunteer Center of Erie County also held a one day collection for all electronics including televisions. The District paid for all televisions and monitors as a sponsorship to that collection. In 2013, The Volunteer Center of Erie County collected 18.98 tons of electronics with their ongoing collection and one day event with 200 cars.

The District also promotes Best Buy and Staples for the recycling of electronics including television recycling. The resident must call the business in advance and the program is only available during business hours. Total tons of material collected from this program in 2013 is unknown, but the District plans on working closer with them to receive an annual survey of materials recycled for the Annual District Report.

### ***Community Grants***

Special collections the District offered were Community Grants. Erie County cities, villages and townships were able to apply to receive grant funding to conduct one or more community cleanup event(s) for their residents in 2013. All local political subdivisions were able to apply and receive \$1,000 for recycling events that they have for their residents. Eleven of sixteen eligible communities conducted events in 2013. Nearly 43 tons of scrap tires, scrap metal, and yard waste were recycled in these events. The tonnages have already been counted in their respective descriptions and will not be added to the special collection totals as to not double count.

The benefits of the Community Cleanup grants include cost sharing between the District, the political subdivision and, in some cases, the participants; manpower and equipment provided by the political subdivision; target materials selected according to the priorities of the political subdivision and good local promotion and participation. On the other hand, four political subdivisions chose not to take advantage of the District's offer and their residents did not benefit from the program. The District will offer this program when funds allow, as the municipalities that participate stated they would continue their collections with or without District funding.

### ***Household Battery Recycling Program***

In 1997, the District began a partnership with six retail stores to recycle household batteries. The six stores agreed to collect batteries on a continuous basis, and ship them to Battery Solutions, a battery recycler in Michigan. The District agreed to reimburse the stores for shipping and pay the recycler.

Beginning 2007 the battery recycling program underwent changes to include: PSC Environmental being the current hauling contract for the battery recycling program and businesses no longer had to ship the batteries. The batteries are collected from each business by the District, brought to a central location, stored until they can be picked up by PSC, and the District is billed for the materials. A total of 4,915 pounds of household batteries were collected, up 39% from the 2000 District Plan.

The District had some issues with PSC being able to keep up with the demand of collection and late 2013 they stopped pick-ups all together. In late 2013, the District terminated the contract with PSC and contracted with Veolia. The program continues to operate in the same matter in that it has in the past. In 2013, the program collected 7,550 pounds. This was lower than 2012, but that was because collection stopped. High tonnages were reported in 2014 (20.59 tons) to make up for the lack of collection in 2013. The District will re-evaluate how the program operates once it has a few years of "normal" pick-ups.

The advantages of this program include minimal collection cost for the District, high visibility, strong participation, and continuous availability of recycling opportunity for household batteries. The disadvantage of this program is the high cost of processing even with the modification to the program, approximately \$2,302.33 per ton.

### ***Lead Acid Battery Recycling***

The amount of lead acid batteries reported to the District was by a small business at 0.10 tons in 2013. Neither scrap yard returned the Annual Survey to the District for the 2013 reporting period.

The advantages of this program are the low cost and involvement of private sector businesses in recycling of these materials. Simply conducting the survey appears to have encouraged some businesses to accept these materials from the public. The disadvantage



to this approach is the inability to determine the amount of used oil and tires recycled by commercial businesses.

### ***Household Hazardous Waste Collections***

A one day household hazardous waste collection took place on Saturday, October 2011 at the Erie County Fairgrounds. The materials collected included, but not limited to: oil based paint, adhesives, roof tar, sealers, batteries, pesticides, and aerosols. Materials totaled 49.86 tons and cost the District \$25,575.24. The tonnage was up 53% from the 2007 collection. The cost was up 41% from the \$15,148.17 cost in 2007. The District had a total of 700 cars in two hours and the collection that normally lasts three hours lasted eight hours. This was the last time the District held a one day collection. In 2012, the District scheduled five-one day collections. The collections occurred the last Saturday of each month from June – October. The program changes have worked great for both the District and the public. Wait time is only about 5-10 minutes versus the 2 hour wait of the one day collection. An average of 232 cars attend the collection annually with an average of 18.34 tons, and an average cost of \$15,079.27. In 2013 the District collected 23.19 tons of materials from 227 cars with \$22,312.50 in expenses.

Although the District collected or aided in the collection of appliances, electronics, phone books, and household hazardous waste in 2013, these materials may not be collected every year. The intent of the District's special collections is to target materials that are difficult to recover on an ongoing basis because the cost to recycle them is high (e.g. Freon containing appliances), and/or private recycling infrastructure is lacking (e.g. electronics and phone books). Because the collections require manpower, equipment, and transportation (See Appendix H for Revenues and Expenses Relating to Appliances and Electronics) the District would like to support sustainable programs to collect appliances, electronics, and phone books in the future, for example:

- Continue to promote the organizations and commercial businesses that collect special materials.
- Help the organizations and commercial businesses that collect special materials with funds whenever possible.
- The current change to the phonebook recycling program has proved to be cost effective and somewhat profitable; due to the fact the District receives credit(s) (depending on the market) from the current paper recycling program.

The District will continue to provide special collections to the residents of Erie County as long as the financial means are available. If the financial means are not available the District may use one of the following options: search grant opportunities, ask for sponsorships, and/or may require a user fee to provide the special collection. When all possibilities are exhausted and the District is not able to provide the services necessary the special collection will not be offered that year in order to be financially responsible for the District's budget, and may claim financial hardship.

### ***District Surveys: Waste Haulers & Commercial Business Recycling***

The commercial businesses in the District are responsible for developing their own waste reduction activities. The District provides information on outlets for materials when requested, and for some businesses actually provides the outlet for cardboard and other materials through the District's drop-off program. Existing scrap yards and haulers promote recycling, particularly cardboard, through purchase of the material.

In 2013, in-District waste haulers responding to the District's annual survey reported 18,082.58 tons of commercial recycling. Although it is likely that a great deal more commercial recycling occurred than was reported for 2013. Tonnage documented through the District's survey is included in Table IV-6 as well as formulas for reporting non-respondents.

### ***Future Institution and Commercial Business Programs***

The District will be hiring a Community Outreach Specialist in 2016 to act as the liaison between the District and Institution/Commercial Business. The Community Outreach Specialist will be responsible for providing waste audits, feasibility studies and aiding the Institution/Commercial Business with:

- Set-Up/Improving Recycling Infrastructure
- Targeting a Specific Material
- Manufacturing with Recycled Products
- Energy Saving Projects
- Feasibility of the District Establishing a Revolving Loan Fund for the long-term of the above mentioned projects.
- Surveys

The District would like to offer a joint workshop with surrounding solid waste districts. The workshop would provide information on current Institution/Commercial Business recycling opportunities, and the above mentioned new opportunities.

The District's webpage will be re-designed in 2016 to be more user friendly and offer more informational and technical assistance to Institutions/Commercial Businesses.

### ***School Recycling***

The District partners with Christie Lane Industries, Huron County's Developmental Disability Workshop, to provide recycling opportunities for schools. In 2013, Erie County schools recycled 25.70 tons.

### ***Yard waste composting***

In 2013, the District received a report from Barnes Nursery Regional Composting Facility stating that 5,226.06 tons of yard waste was collected at their site. However,



Ohio EPA reports state that the Barnes Nursery Regional Composting Facility 8,660.70 tons of yard waste from Barnes Nursery Regional Composting Facility as follows:

<u>Food Waste</u>	<u>Yard Waste</u>	<u>Animal Waste/Other</u>
910.97 tons	4,121.52 tons	3,628.21 tons

The District's 2013 ADR will be off by 3,434.64 tons in a combination of yard waste and food waste categories. In this Plan, the District will continue to use the above information from Ohio EPA moving forward.

Barnes Nursery Regional Composting Facility is the only publicly available compost site in the District. A number of political subdivisions collect leaves or brush seasonally and manage the material through Barnes Nursery or a variety of land application scenarios. Subdivisions were asked to report the amount of leaves and other yard waste collected in 2013. For leaves reported in cubic yards the formula used to convert to tons is as follows:

$$\text{Cubic Yards} \times 1.5 = \text{Tons}$$

The conversion is used by standard engineering practices when measuring soils.

The City of Huron contracts for curbside yard waste collection (optional) as part of its trash and recycling contract. Residents may choose to pay for weekly yard waste collection from April through October. A total of 769.44 tons of yard waste and 85.5 tons of food waste were received in 2013 by Barnes Nursery & Composting Facility.

### ***Land Application of leaves***

In 2013, land application of leaves was not reported by any local political subdivision or business. Many of the local political subdivisions are utilizing Barnes Composting Facility or contracting with a private hauler to provide leaf and yard waste removal for their residents.

### ***Tires***

The Erie County Sanitary Landfill hosts the Tire Recycling Program. Customers pay \$0.09 per The District collected 17.25 tons of tires in 2013.

### ***Incineration***

In 2013 Firelands Regional Medical Facility disposed of medical waste with the company Stericycle. Stericycle is not located within the District, but does operate an incinerator. The District was unable to acquire the amount of material from Firelands Regional Medical Facility that was incinerated by Stericycle.

The Erie County Health Department in cooperation with the Erie County Sheriff's Department, local police departments, and marketing by the District provided drop-off pharmaceutical boxes for Erie County residents. The drop-off pharmaceutical boxes are

located at the Sheriff's Department and several of the local police stations. The drop-off pharmaceutical boxes are locked and under surveillance for safety. Once a month a Sheriff's deputy has a pick-up schedule with Stericycle. Stericycle incinerates the pharmaceuticals in an out of state facility.

In 2015, the District provided funds to the Erie County Health Department to continue the program. In 2015, the Erie County Health Department will be asking Erie County agencies and businesses to include a portion of operation of this program in their 2016 budget for the sustainability of the program.

### ***Recycling and Litter Prevention Education and Awareness programming***

The District has one employee for all operations of the District, and this includes outreach and marketing to the five target audiences. The District is responsible for achieving Goals #3 and #4 of the Ohio EPA State Solid Waste Management Plan including but not limited to:

#### Providing Education on:

- Recycling
- Litter Prevention
- Source Reduction
- Natural Resource Conservation
- Pollution

#### This is achieved by providing:

- Classroom Presentations
- Hosting Workshops
- Assisting with Special Events
- Adult Presentations
- Providing Literature

The District will be hiring an Environmental Education Intern and a Community Outreach Specialist. The Environmental Education Intern will be a year-long internship focusing on the target audience: Schools. The Environmental Education Intern will shift hands on activity boxes and Windows on Waste curricula to a technology based approach with SMART Software for SMART Boards for educators to download from the District's webpage. The Environmental Education Intern will annually provide:

- SMART Software updates
- Create virtual fieldtrips
- Update the District's webpage
- Provide environmental education programs to Erie County Schools
- Facilitate a Teacher Workshop

The District will be hiring a Community Outreach Specialist in 2016 to act as the liaison between the District and Institution/Commercial Business and Industries. The Community Outreach Specialist will be responsible for providing waste audits, feasibility studies and aiding the Institution/Commercial Business and Industries with:

- Set-Up/Improving Recycling Infrastructure



- Targeting a Specific Material
- Manufacturing with Recycled Products
- Energy Saving Projects
- Feasibility of the District Establishing a Revolving Loan Fund for the long-term of the above mentioned projects.
- Surveys

The District would like to offer a joint workshop with surrounding solid waste districts. The workshop would provide information on current Institution/Commercial Business and Industries recycling opportunities, and the above mentioned new opportunities.

In 2013, activities included classroom presentations, school contests, teacher workshops, teacher newsletters, educational resource boxes, summer camp programs, displays, Erie County Fair and informational literature at community events, and general audience presentations. Over 12,000 Erie County residents were reached through this program in 2013.

An Education and Awareness Plan can be found in Appendix K. The Education and Awareness Plan will be added to the Solid Waste Plan as an Appendix or as determined by the Ohio EPA. The District will address how to provide education and awareness to the following five target audiences:

1. Residents
2. Schools
3. Industries
4. Institutions and Commercial Businesses
5. Communities and Political Leaders

The focus will be on outreach not just education. There will be a minimum number of programs for each audience, example of programs, and how information will be disseminated. The Education and Awareness Plan is in response to Ohio EPA's upcoming State Solid Waste Management District Plan update.

#### ***Informational Assistance on Recycling, Reuse, Composting and Household Hazardous Waste Management***

In 2013, the District provided a comprehensive recycling guide available in print or online: <http://www.eriecounty.oh.gov/departments-and-agencies/environmental-resources/department-of-environmental-services/recycling/how-what-where-to-recycle/>

The District also maintained a Web site within the Erie County Department of Environmental Services site at [www.ErieCountyRecycles.org](http://www.ErieCountyRecycles.org) with extensive recycling, reuse, composting and household hazardous waste information. The site contains all of the information in the above brochures, and the following: composting, special material recycling, reuse, household hazardous waste management and alternatives, a calendar of recycling events and other pertinent and useful information.

The District maintains a variety of social media to provide outreach and marketing. Green Erie County is the Facebook page the District uses for general recycling opportunities, while Erie County Can Facebook page focuses on curbside recycling. The District also uses ErieRecycles Twitter page and ErieRecycles YouTube page for videos.

Both Recycling Guides and the Web site are cost-effective methods of distributing current information to residents about recycling and related topics. The District also utilizes free space on the Erie County Water Bill to disseminate information to Erie County Residents.

The strength of this program is that all the information is now consolidated and can be found easily online or distributed online. This program is easy for the District to update and little cost is involved since you only print what you need.

The weakness of this program is that if you don't know where or what you are looking for you may not be able to find the information. If a resident does not have access to the internet this information will not be found unless by phone.

The District will be going through a website re-design in 2016 that will be more user friendly.

#### **Industrial Sector Waste Reduction**

The District conducted a survey of industries and scrap yards in November 2007 thru March 2008 to determine the amount of materials recycled or reduced in the reference year. The survey results are presented in **Table IV-7** and Appendix F. Industries reported recycling 219,669.10 tons during 2007.

Of the 119 industries, 81 responded to the survey (See Appendix F for a summary of survey responses). The District was careful not to double count recycling. The District's industrial recycling survey was the only data used to compile industrial recycling figures. Respondents were asked to identify where each type of material was recycled. If an industry reported waste was recycled at Sandusky Steel, Barnes Nursery Compost Facility, or the District's drop-off recycling program, the amount was excluded from the industry's total, and was assumed to be included in the totals reported by Sandusky Steel, Barnes Nursery or the District. This avoided double counting of the materials.

Of the two scrap yards operating in the District, neither responded.

The District did not document any source reduction activities, industrial incineration or resource recovery during the reference year.

#### ***Future Industrial Programs***



The District will be hiring a Community Outreach Specialist in 2016 to act as the liaison between the District and Industries. The Community Outreach Specialist will be responsible for providing waste audits, feasibility studies and aiding the Industries with:

- Building a database for Industries
- Set-Up/Improving Recycling Infrastructure
- Targeting a Specific Material
- Manufacturing with Recycled Products
- Energy Saving Projects
- Feasibility of the District Establishing a Revolving Loan Fund for the long-term of the above mentioned projects.
- Surveys

The District would like to offer a joint workshop with surrounding solid waste districts. The workshop would provide information on current Industries recycling opportunities, and the above mentioned new opportunities.

The District's webpage will be re-designed in 2016 to be more user friendly and offer more informational and technical assistance to Industries.

In addition to the joint workshop the District would like to create a Materials Wanted/Materials Needed page on the website specifically for the industrial sector. Industries would be able to post materials that they have that they would like to recycle or dispose of and materials they are searching for their industry.

**F. Total Waste Generation: Historical Trends of Disposal Plus Waste Reduction**

**Table IV-8** contains waste reduction and waste disposal amounts obtained from historical records for the period 2009 through 2013. All data related to reduction, recycling, yard waste and incineration was derived from the annual district reports of the Erie County Solid Waste District from 2009 through 2013. The data in these reports was compiled from annual surveys of District industries, recycling programs, composting facilities and businesses holding air pollution control permits. All landfill disposal data was derived from Ohio EPA documents.

**G. Reconciliation of Waste Generation**

Using the national generation rate of 4.4 pounds per person per day, industrial survey data and calculated industrial generation rates, the District estimated total waste generation for 2013 at 372,085 tons as shown in Table IV-5. However, actual landfill disposal plus reported waste reduction activities in 2013 accounted for 263,593 tons of waste generation as shown in Table IV-9. Residential/commercial waste generation was underestimated and Industrial waste generation is overestimated.

The underestimation of residential/commercial waste generation is due in part to the influx of 9 million tourists, which Erie County receives each year from May to October. Actual generation (i.e. landfill disposal plus recycling/composting) of residential/commercial solid waste in 2013 was 74,401 tons. The amount of residential/commercial

waste generation expected from the District's population using the national generation rate of 4.6 pounds per person per day is 57,431 tons. The difference of about 16,970 tons is approximately the amount of waste generated by 7.4 million people in one day at the rate of 4.6 pounds per person per day.

Since industries representing 32% of the District's industrial employment did not respond to the survey with both disposal and recycling data, and since much of the disposal data was converted from cubic yards to tons based on a uniform estimate of 100 pounds to the cubic yard, such variation is not surprising. Consequently, the District will base future projections on actual disposal and recycling data as shown in Table IV-8. These numbers include actual recycling reported by a number of industries that were excluded from the survey respondents because they did not report disposal data. The District believes Table IV-8 is more accurate than projections from national data and limited surveys.

**Table IV -9** contains the adjusted waste generation figures which will be used throughout the remainder of the plan to predict waste composition, make projections and determine management capacity needs. Waste generation totals were calculated in the following manner:

<b>Residential/Commercial Waste</b>	
Landfill Disposal - GSW	74,401
Landfill Disposal - asbestos	532
Reported Recycling	29,256
Composting	8,661
Yard Waste Land Application	60
Net Incineration	0
<b>Total</b>	<b>112,909</b>
<b>Industrial Waste</b>	
Landfill disposal - ISW	10,374
Reported Recycling	112,200
Composting	0
<b>Total</b>	<b>122,574</b>
<b>Exempt Waste</b>	
Landfill Disposal - Exempt	24,952
<b>Total Waste Generation</b>	<b>260,435</b>

## H. Waste Composition

### 1. Residential/Commercial Sectors

Composition of the residential/commercial waste stream as shown in **Table IV-10** was estimated by using the percent of total generation for each material as shown in



“Municipal Solid Waste in the United States: 2013 Facts & Figures” from the U.S. EPA (See Appendix H). The materials shown in the table were chosen because they are materials with the greatest potential to be recycled within the District.

2. *Industrial Waste Sector*

Composition of the industrial waste stream as shown in **Table IV-11** was determined from the industrial survey conducted by the District in March, 2014, plus landfill disposal records. The estimated waste composition of the industrial sector includes the materials that District industries reported as recycled, and those materials that were landfilled. The largest components of the industrial waste stream were other (66,176 tons), cardboard (24,841 tons) and plastic (23,251 tons). The waste disposed in landfills was considered mixed solid wastes.

Table IV-1. Reference Year Population and Residential/Commercial Generation

County Name	Population		Generation Rate (lbs./person/day)	Total District Res/Com Generation (TPY)
	Before Adjustment	After Adjustment		
Erie	75,828	71,524	4.4	57,434
Vermilion City	-4,663			
Milan Village	358			
Bellevue City	-2			

**Calculations:****Adjustments:**

**Vermilion** - The portion of the population of the City of Vermilion residing in Erie County (4,663) is subtracted because more than 50% of the population is in Lorain County (5,815).

**Milan Village** - The portion of the population of the Village of Milan residing in Huron County (358) is added because more than 50% of the population is in Erie County (1,004).

**Bellevue** - The portion of the population of the City of Bellevue residing in Erie County (2) is subtracted because more than 50% of the population is in Sandusky County (4,464).

**Residential/Commercial Generation Rate:**

$$\frac{(\text{Population})(\text{Generation Rate})(365)}{2,000} = \text{Total Res/Com Generation}$$

**Source of information:**

2014 Census of Population by Age, Race, and Hispanic Origin for Ohio's Governmental Units; U.S. Department of Commerce, Bureau of the Census; Prepared by Ohio Department of Development, Office of Strategic Research

Municipal Solid Waste in the United States: 2013 Facts and Figures, U.S. EPA



**Table IV-3. Industrial Waste Generation Survey Respondents vs. Unreported**

Total Waste Generated by NAICS Code (Respondents & Non-Respondents)											
Survey Respondents						Survey Non Respondents					
NAICS Industries	No of Industries	Employees	Tons Waste	Tons Recycled	Total Tons	Generation Rate	# of Industries	# of Employees	Tons of Waste Generated	Generation Rate	Total
20	1	20	217.72	14	231.72	11.59					231.72
21	1	0	0.00	0	0.00		1	40	176.00	4.4	176.00
23	5	47	1,313.00	1,620.11	3,933.11	83.68	3	70	5,857.83		9,790.94
31	6	86	277.00	372.00	549.00	6.38	4	330	2,106.63		2,655.63
32	12	247	2,001.02	76,960.01	79,147.46	320.44	5	394	126,251.41		205,398.87
33	34	1,950	399.00	13,905.09	24,904.64	12.77	12	1,603	20,472.89		45,377.53
42	11	154	529.98	763.35	1,058.33	6.87	6	156	1,072.07		2,130.40
44	3	515	249.56	5,693.31	6,042.91	11.73	1	10	117.34		6,160.25
45	1	0			0.00		1	20	92.40	4.62	92.40
54	4	0			0.00		4	223	1,097.16	4.92	1,097.16
71	2	1,060	2,373.64	0.00	3,373.24	3.18	1	60	190.94		3,564.18
81	1	0			0.00		1	3	8.94	2.98	8.94
92	1	170	55.70	1,302.70	1,258.40	7.40					1,258.40
99	1	900	174.28	11,583.00	11,757.00	13.06					11,757.00
											0.00
											0.00
<b>Total</b>	<b>81</b>	<b>5,129</b>	<b>7,373.18</b>	<b>112,199.57</b>	<b>132,024.09</b>	<b>1.44</b>	<b>38</b>	<b>2,869</b>	<b>157,443.61</b>	<b>54.88</b>	<b>289,699.42</b>

**Calculations:**

Generation rate for survey respondents = Tons of waste generated/ # of employees

Tons of waste generated by unreported industries = # of employees \* Generation rate from Table JJ-2 for all

Total industrial waste generated = Tons of waste generated by survey respondents + tons of waste generated by unreported

Unknown number of employees since the SIC codes were obtained through the Erie County Chamber of Commerce Industry Directory

**Source of information:**

Annual District Report surveys for calendar year 2013, Erie County SWD

Generation Rates for SIC are from Table JJ-2, "District Plan Format Version 3.0"

Erie County Chamber of Commerce Industry Directory 2013

Erie County Economic Development list of Businesses and Industries by NAICS

Manta <http://www.manta.com/>

**Table IV-4. Exempt Waste Generated in the District and disposed in publicly-available landfills**

Type of Waste Stream	Generation Rate (lbs./person/day)	Total Exempt Waste Generation (TPY)
construction & demolition debris		
non-toxic foundry sand		
slag		
Totals	1.91	24,952

**Calculations:**

$$\text{GenerationRate (lbs./person/day)} = \frac{(\text{Exempt Waste Generation}) * (2000)}{365 * \text{Population}}$$

$$1.35 \text{ lb/person/day} = \frac{(24,952) * 2000}{(365) * (71,524)}$$

**Table IV-5. Reference Year Total Waste Generation for the District**

Type of Waste	Generation Rate (lbs./person/day)	Total Waste Generation (TPY)
Residential/Commercial	4.4	57,434
Industrial	22.20	289,699
Exempt	1.91	24,952
Total Waste Generation	28.51	372,085

**Calculations:**

$$\text{Industrial Generation Rate (lbs./person/day)} = \frac{(\text{Industrial Waste Generation}) * (2000)}{365 * \text{Population}}$$

$$\text{lb/person/day} = \frac{(372,085) * 2000}{(365) * (71,524)}$$



**Table IV-6. Reference Year Residential/Commercial Waste Reduction in the District**

Type of Waste Source Reduced	TPY	Type of Waste Recycled	TPY	Incineration, Composting, Resource Recovery		
				Total Waste Received	Residual Landfilled	Net Waste Processed
		appliances	1	Incineration	Ash	Net Incin.
		household batteries	4.28			
		lead-acid batteries	0.1			
		glass	1224.17	Composting 8,660.70	Residuals	Net Compost 8,660.70
		electronics	100.88			
		ferrous metals	6,392.61	Resource Rec	Ash	Net Res. Rec.
		non-ferrous	1,097.43			
		cardboard	3,664.24	Yard Waste Land Appl. 0	Residuals	Net Land Appl. 0
		other paper	3,423.76			
		plastics	1092.16			
		scrap tires	1203.35			
		mixed recyclables	18.63			
		Household Hazardous Waste	14.55			
		Used Motor Oil	4.17			
		Wood	90.33			
		Ash	250			
		Food	1276.46			
		Textiles	737			
		Subtotal	20,595.12		Subtotal	8,660.70
Grand total						29,255.82

Source: Annual District Report (for calendar year 2013), Erie County SWMD

Quantities of Waste Recycled in TPY are derived from surveys of the following programs (also listed on page IV-3).

Double counting of Waste Recycled was eliminated by the methods stated.

Erie County SWD drop-off program	- single reporting entity; only SWMD reported
Erie County SWD special collections	- single reporting entity; only SWMD reported
City of Huron curbside	- single reporting entity; only City of Huron counted; processor's report eliminated
Household battery recycling	- single reporting entity; only SWMD reported
Waste hauler surveys (commercial)	- single reporting entity; only hauler reported; generators not surveyed
Commercial business surveys	- single reporting entity; only generators reported; processors not surveyed
Yard waste composting	- single reporting entity; only compost facility report counted; political subdivisions' reports of delivery to compost facility eliminated
Land Application of yard waste	- not applicable
Net incineration	- single reporting entity; only generator reported

**Table IV-7. Reference Year Industrial Waste Reduction in the District**

Type of Waste Source Reduced	TPY	Type of Waste Recycled	TPY	Incineration, Composting, Resource Recovery		
				Total Waste Received	Residual Landfilled	Net Waste Processed
		Appliances	0.55	Incineration	Ash	Net Incin.
		household batteries	0.00	0	0	0
		Emission Control Dust	77.31	Composting	Residuals	Net Compost
		food	0.00			
		ferrous metal	12,235.92			
		non-ferrous	192.00	Resource Rec	Ash	Net Res. Rec.
		non-exempt foundry sand	179.74	0	0	0
		cardboard	22,714.85	Yard Waste Land Applc	Residuals	Net Land Appl.
		other paper	108.30			
		plastics	147.17			
		tires	32.88			
		wood	316.25			
		stack solids	76,122.00			
		oil filters	0.00			
		glass	0.80			
		Ash	72.00			
		Subtotal	112,199.77		Subtotal	0.00
				Grand total	112,199.77	

Source: Annual District Report (for calendar year 2013), Erie County SWMD



**Table IV-8. Total Waste Generation based on Disposal plus Waste Reduction**

Management Method Used in TPY							
Year	Reduction & Recycling	Y W Composting	Y W Land Application	Net Incineration	MSW Composting	Landfill Disposal	Total Waste
2009	182,182	8,249				70,197	260,627
2010	159,739	6,474				73,965	240,177
2011	130,654	6,932				85,663	223,248
2012	147,839	5,151				84,579	237,570
2013	132,741	8,661				88,525	229,927

Source: <sup>1</sup> Landfill Disposal In-District, Out-of-District, Out-of-State by SWMD

<sup>3</sup> Annual District Reports (for calendar year 2009-2013), Erie County SWMD

Calculation:

Total Waste = Source Red. & Rec. + YW Composting + YW Land App + Incineration + MSW Compost + Landfill Disposal

**Table IV-9. Adjusted Reference Year Total Waste Generation for the District**

Type of Waste	Generation Rate (lbs./person/day)	Total Waste Generation (TPY)
Residential/Commercial	8.65	112,909
Industrial	9.39	122,574
Exempt	1.91	24,952
Total Waste Generation	20.19	263,593

Calculation:

Generation Rate = (Tons/Year/ (Population from Table IV-1))/365 days) \* 2000 pounds

Sample:

Res/Com Generation Rate = ((116,068/ 71,524)/365)) \* 2000

**Table IV-10. Estimated Residential/Commercial Waste Stream Composition for the District for the Reference Year**

<b>Waste Stream Composition for the District for the Reference Year</b>		
<b>Waste Stream Type</b>	<b>%</b>	<b>Tons</b>
Paper and Paperboard	15.1%	16,489
Food	21.1%	23,041
Glass	5.0%	5,460
Ferrous Metals	7.0%	7,644
Nonferrous Metals	0.4%	437
Plastics	17.7%	19,328
Scrap Tires	1.6%	1,747
Yardwaste	8.1%	8,845
Other	24.0%	26,208
Total	100.0%	109,198

Source: <sup>1</sup> Chapter 2, Characterization of Municipal Solid Waste By Weight, Municipal Solid Waste in the United States: 2013 Facts and Figures, U.S. EPA (See Appendix H)

Calculation:

Tons per material = (Percentage of the waste stream per material) \* (Tons of Res/Com Waste Generation from Table IV-9)

**Table IV-11. Estimated Industrial Waste Stream Composition for the District for the Reference Year**

Waste Stream Type	TPY	Waste Stream Type	TPY		
Appliances	2,205	other non ferrous	32,218		
Cardboard	18,498	Paper	490		
Dry Cell Batteries	0	Plastics	18,498		
Electronics	1,960	Scrap Tires	21,683		
Emmission Control Dust	0	Stack Solids	1,960		
Ferrous metals	8,575	Textiles	0		
Food	0	Used Motor Oil	0		
Glass	6,493	Wood/Sawdust/Pallets	0		
Non Exempt Foundry Sand	0	Yardwaste	0		
Oil Filters	0	Ash	9,923		
Other	32,218				
Subtotal	69,949	Subtotal	84,771	Grand Total	154,720

Source: Annual District Report (for calendar year 2013), Erie County SWMD  
 Chapter 2, Characterization of Municipal Solid Waste By Weight, Municipal Solid Waste in the United States: 2013  
 Facts and Figures, U.S. EPA (See Appendix H)

Calculation:

Tons per material = (Percentage of the waste stream per material) \* (Reported Recycling Industrial Waste Generation from Page IV-13) + (2007 Industrial Survey Tonnage)