

ADAMS COUNTY
MUNICIPAL SOLID WASTE
MANAGEMENT PLAN UPDATE
June 2019



PREPARED BY:
Adams County Office of Planning & Development
*with assistance of the Adams County Solicitor's Office
and the Adams County Solid Waste Advisory Committee*

ADAMS COUNTY MUNICIPAL SOLID WASTE MANAGEMENT PLAN UPDATE

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CHAPTER 1 | DESCRIPTION OF WASTE

1.1 INTRODUCTION

1.1.1 Overview of Planning Process

This Municipal Solid Waste Management Plan Update was prepared in accordance with the requirements of Act 101 of 1988, the Municipal Waste Planning, Recycling, and Waste Reduction Act, as amended. Act 101 delegates to counties the power and duty to prepare and implement plans for the disposal and processing of municipal solid waste generated within the county. The responsibility and authority for the collection and transportation of the waste and of source-separated recyclables is delegated to local municipalities under the Act. To implement plans, the Act also accords to counties the authority to adopt ordinances and regulations and enter into contracts for the disposal and processing of the municipal solid waste, in accordance with the county municipal solid waste management plan.

Act 101 calls for Pennsylvania counties to develop comprehensive, integrated municipal solid waste management plans. A county municipal solid waste management plan should consider the optimal complementary use of a variety of management technologies, such as waste reduction, reuse, recycling, waste processing, composting, landfilling, and waste-to-energy. The Act specifically requires that the county plan provide for the maximum feasible development and implementation of recycling programs to meet the 35 percent recycling goal of the Commonwealth. A common theme throughout Adams County's updated plan is the reliance on partnerships to accomplish these goals and objectives.

This 2019 Adams County Municipal Solid Waste Management Plan (Plan) builds upon and updates information contained in the 2005 Adams County Municipal Waste Management Plan. As part of the planning process, the Adams County Office of Planning and Development:

- Established a Solid Waste Advisory Committee (SWAC)
- Issued a Request for Proposals (RFP) for waste disposal and processing capacity
- Involved SWAC in the planning/research/review/comment process
- Worked with municipalities to structure municipal waste collection contracts to ensure Plan compliance
- Updated Adams County population, municipal solid waste tonnage, and recycling projections for the next planning period
- Identified existing waste collection, recycling, transportation, processing, and disposal practices
- Estimated waste disposal needs of Adams County for the planning period through January 1, 2029
- Evaluated proposals submitted in response to the disposal RFP
- Secured multiple contracts with disposal and processing sites, for sufficient capacity for Adams County for this 10-year planning period
- Conducted sewage sludge surveys
- Updated the Adams County Municipal Solid Waste Management Plan

1.1.2 Public Participation

In order to provide for public participation in the planning efforts related to this Plan, the Solid Waste Advisory Committee (SWAC), appointed by the Adams County Commissioners, assisted the Adams County Office of Planning and Development in preparing the Municipal Solid Waste Management Plan Update for the County by providing input from the citizenry, waste management organizations, selected interest

groups, and municipal officials within Adams County. SWAC members met initially in October 2011 to establish County goals and objectives and have been active throughout the planning process. At the beginning of the planning process, SWAC members toured the following facilities: Blue Ridge Landfill, Mountain View Reclamation Landfill, Washington Township Transfer Station, Cumberland County Landfill, Hanover Transfer Station, Modern Landfill, and the York County Resource Recovery Center.

1.1.3 Purpose – Chapter 1

The purpose of this Chapter is to describe the types and quantity of Municipal Solid Waste (MSW) generated in Adams County that will be managed by the systems described in this Plan. In order to plan for the disposal and processing of MSW in Adams County, certain methods of measuring the quantity and composition of the County's waste were identified. These methods were used to determine historical waste generation rates, project future waste generation rates and estimate the potential diversion of waste through source separation, recycling and other waste reduction programs. These methods were also used to estimate the required capacity of disposal and processing facilities that may be utilized.

Sections 1.1 and 1.2 describe the County. A description of the various waste types is presented in Section 1.3. Sections 1.4 through 1.12 describe waste generation and composition in the County, including municipal solid waste, construction/demolition waste, sewage sludge, infectious and chemotherapeutic waste, household hazardous waste, residual waste, waste tires, yard/leaf waste, and bulky waste.

1.1.4 Description of the County

1.1.4.1 Location

Adams County is located in Southcentral Pennsylvania along the Maryland border. The County lies between York and Franklin Counties to the east and west respectively, Cumberland County to the north, and Frederick and Carroll Counties to the south in Maryland (Figure 1-1 Regional Location Map). Adams County is situated on the western fringe of the vast urban and urbanizing complex, stretching from Boston to Norfolk, including other major cities of New York, Philadelphia, Baltimore, Washington D.C., and Richmond. Areas of regional influence are depicted in the Proximity Map presented in Figure 1-2. These cities and metropolitan locations may have a future impact on Adams County as these areas continue to grow.

FIGURE 1-1: LOCATION

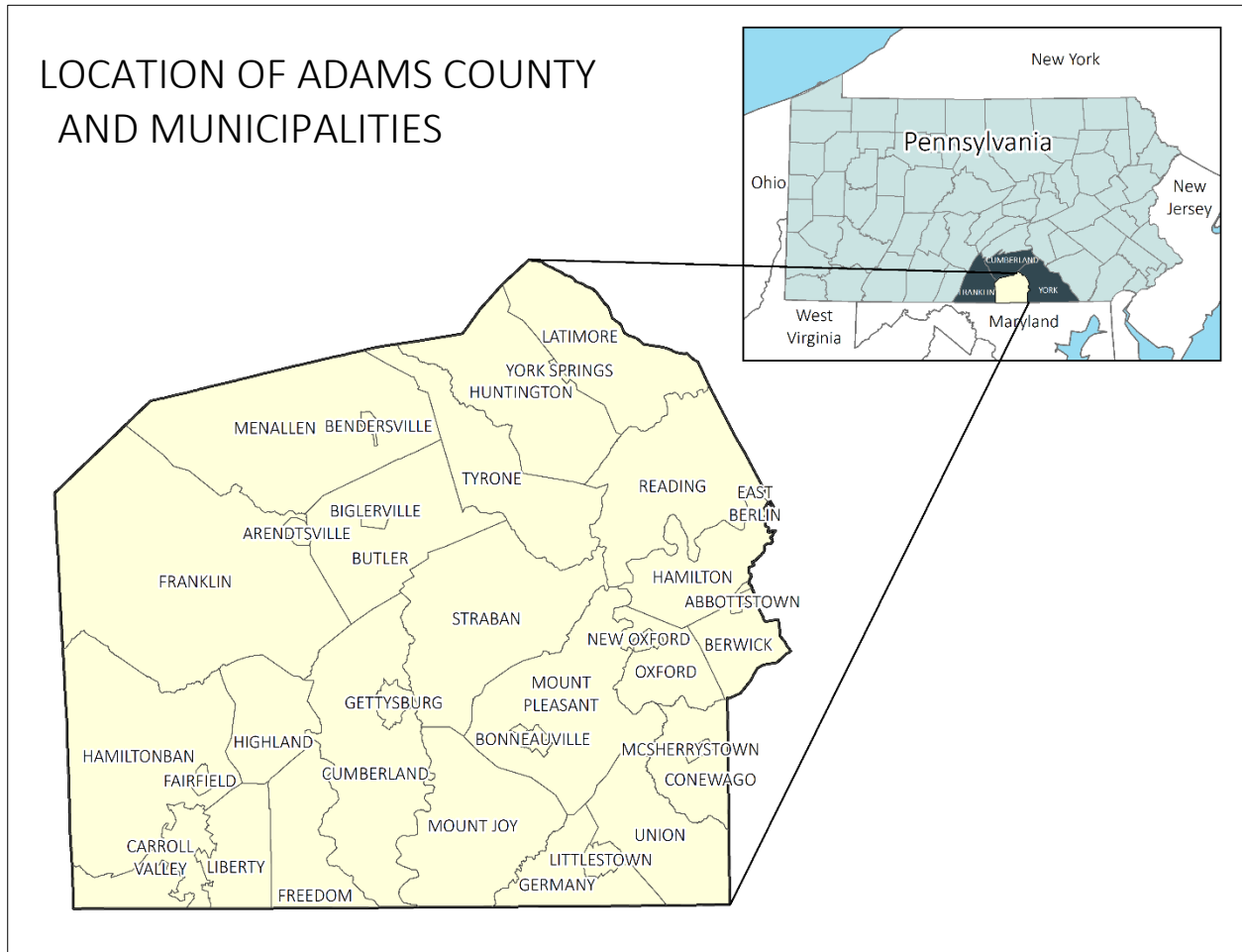
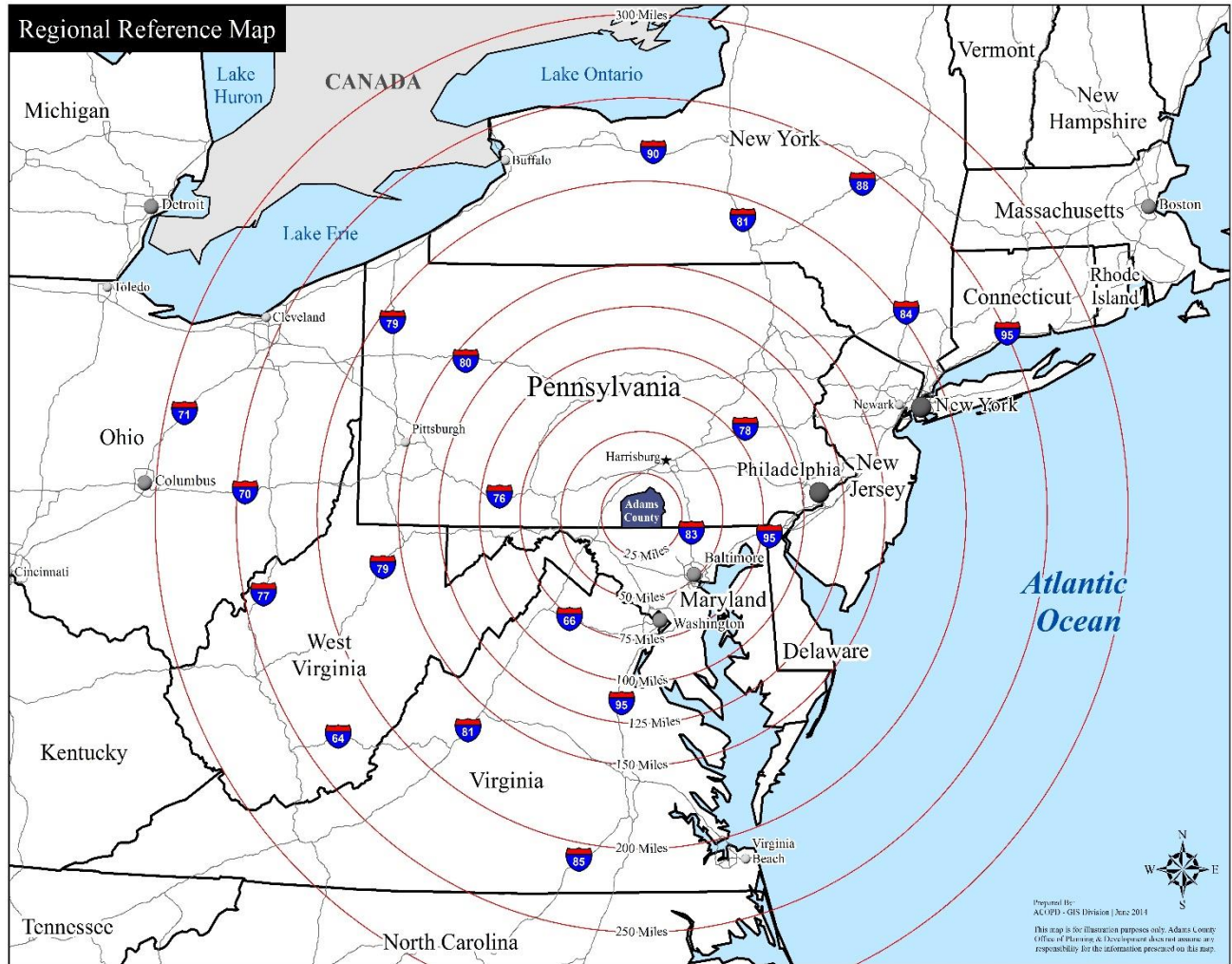


FIGURE 1-2: ADAMS COUNTY PROXIMITY MAP



1.1.4.2 Growth Trends and Issues

The County previously experienced a significant increase in the level of development activity, but most recently has entered a period of moderate growth. Most land development in the County has occurred adjacent to boroughs and near public water and sewer infrastructure.

The two pillars of Adams County's economy are agricultural activities and tourism. The overall level of agricultural activity is relatively high, with an increasing focus on local farm markets, cideries, and wineries. Tourism, which until recently was focused almost exclusively on Gettysburg and the National Military Park, is now spreading into the County's unique fruit belt, the South Mountain area, and into the picturesque villages and scenic areas of the countryside.

Development issues and problems of concern to County residents are varied, and may include, but not be limited to the following:

- The majority of municipalities in Adams County have been engaged in updating their comprehensive plans to better plan for increased development.
- Many municipalities (22) have entered into a joint waste collection bidding contract process that has traditionally resulted in cost-effective pricing with more varied services.
- Some existing sewer and water systems are inadequate to accommodate new development without investment for expansion. In general, most new development should continue to be located within, or adjacent to, designated growth areas served by public sewer and water. If public sewer and water capacity is not provided in designated growth areas, new development is likely to locate outside designated growth areas and be served by privately developed infrastructure. The pattern that ultimately emerges will significantly impact how solid waste management is addressed.
- The agricultural resources of the County are being threatened by lack of a sufficient workforce, invasive species, erratic weather patterns, and limited economic opportunities for young farmers.
- The general lack of sustaining economic opportunities, affordable housing options, and new employment choices in the County for all age groups, but most especially for young adults, is leading to significant and unhealthful demographic changes.
- More dense development patterns have created conflict among property owners concerning certain waste disposal practices (primarily the burning of waste).
- The lack of a sufficiently funded State recycling program for covered devices has impeded the responsible handling of these items in certain areas of the County.

Adams County is heavily influenced by neighboring communities. Both employment opportunity and shopping facilities are comparatively more abundant in the Hanover, York, and Harrisburg areas in particular, and to a lesser extent in Chambersburg and Carlisle. The availability of these out-of-county facilities within easy commute for Adams County residents has probably caused a moderation in industrial and commercial growth in Adams County. Another influencing factor is the change in how shopping is now conducted through internet shopping and home delivery opportunities. There is, however, a popular shopping facility located south of Gettysburg, which continues to attract clientele from parts of Northern Maryland, along with a slowly expanding commercial sector developing on the eastern boundary of Gettysburg. Downtown Gettysburg, with Borough support, is also attracting new restaurants and specialty shops as inviting destinations for locals and visiting tourists.

Economically, the County is characterized by a low wage structure and relatively low income levels, especially among long-term residents. Average household income in the County is rising, but the increase appears to be the result of the in-migration of new residents continuing to work outside the County. There is a general concern for the lack of new economic and employment opportunities in the County, and a growing concern for the increasing disparity of income levels between older and newer residents. It is important to note that almost 64.7 percent of Adams County's commuters work outside of the County. It can be assumed this condition would have an impact on waste generation figures. It is also important to note that Adams County, like many areas across the Country, is experiencing a lack of affordable housing for all sectors of the community.

Adams County comprises approximately 526 square miles of land. According to the 2010 U.S. Census, the total population was 101,407 people. Adams County is divided into 13 boroughs and 21 townships, each with its own local government. The Borough of Gettysburg, in the southcentral part of the County, is the largest population center. The 13 boroughs represent approximately 30 percent of the County's total population. The remaining 70 percent of the population is located in the relatively rural townships, although there are a few densely populated areas within some of the townships.

Residential development is the greatest use of land among the high-activity uses in the County. Roadways are the second greatest activity use, and occupy over four times the land devoted to commercial and industrial activities. The estimated number of commercial, industrial, and occupied residential establishments is provided in Table 1-1.

TABLE 1-1: ESTIMATED NUMBER OF ESTABLISHMENTS IN COUNTY

ESTIMATED NUMBER OF ESTABLISHMENTS (2012)	
SECTOR	NUMBER ⁽¹⁾
Commercial / Industrial Businesses	3,681
Occupied Residential Housing Units	38,013

⁽¹⁾ Esri Community Analyst, April 18, 2012

The pattern of residential development in the County is an important factor related to solid waste management. For the past 25 years, the majority of new development in Adams County has occurred within, or adjacent to, existing boroughs or villages, and within growth areas established in County and municipal comprehensive plans. There are exceptions, however, and a portion of the County's new housing development has occurred on subdivisions in rural settings. Approximately 30% of new housing has been developed on rural lots located outside designated growth areas or other areas served by public utilities. This development pattern was envisioned by the Adams County Comprehensive Plan; however, in recent years it has slowed down. Subdivision plans reviewed by the County in the past five years would indicate a continuance of this slowing trend.

One of the more effective means for reducing service costs is through inter-municipal cooperation. State Law provides that municipalities may do virtually everything collectively that they may do individually. Such cooperation is absolutely necessary if citizens are to receive the types of services they desire, and are entitled to, at a reasonable cost. The Adams County Council of Governments (COG) serves as a catalyst for many inter-municipal efforts. The COG membership includes 29 of 34 local municipalities, county government and all 6 local school districts.

Rural residential patterns often create uneconomical waste collection systems. The fewer customers per mile, the greater the cost per customer. The absence of mandatory refuse pick-up requirements in most of Adams County results in possibly greater than one-half of rural residences foregoing refuse service in favor of disposing of their wastes on their own. In some cases, residents share refuse service with relatives and friends (without the knowledge of the hauler), while others self-haul their wastes directly to disposal facilities such as the Hanover Transfer Station, Neiderer Sanitation Transfer Station, and Washington Township Transfer Station. Other residents perform improper self-disposal by means of burning, burial or littering, which creates, and may continue to create, environmental degradation and, in particular, threatens ground water quality. The County, through its Department of Protective Services has been assisting municipalities with enforcement of State laws relative to the practices of burning, dumping and littering for many years, and will continue this assistance. The County will also promote the education of municipalities and residents regarding the hazards of such practices. Adams County adopted the "County of Adams Municipal Solid Waste, Recycling, Littering, and Sewage Sludge Transporters Ordinance", establishing a litter control program to help ensure all waste is disposed of in a proper, appropriate, and legal manner. This Ordinance replaced the County's former hauler licensing ordinance.

In addition to household refuse, residential land use generates sewage sludge. Sewage sludge is the form of residue from public wastewater treatment plants, and can potentially contain one or more of a variety of heavy metals whose cumulative pollutant levels must be monitored and tested. Wastewater treatment plants in Adams County primarily rely on land application and/or transport to out-of-County treatment facilities for disposal of wastes. Sewage sludge (septage) is also the form of residue from the septic tanks of houses (not on public sewage systems) that is typically trucked to land application sites or wastewater treatment plants located outside of the County. Sewage sludge disposal is an issue of concern for Adams County because no wastewater treatment plants within Adams County have the capability to accept and treat the wastes from septic tanks. In addition, more townships (almost half) are implementing sewage management districts that require regular pumping of septic tanks, creating more waste in need of disposal. It is also important to recognize that a substantial number of out-of-County sources generate sewage sludge which is then land applied in Adams County. Increasingly, available permitted land disposal sites may become competitively sought by these out-of-County sources, thereby limiting opportunities for local treatment plants. Adams County has been monitoring this situation and researching possible new opportunities for a means of disposal.

Existing wastewater treatment plants in Adams County lack the necessary technology to produce Class A sludge for unrestricted uses. Technologies for producing Class A sludge are an important consideration for the future planning for disposal of Adams County sewage sludge.

The concentration of tourist facilities in the Gettysburg area has serious implications for solid waste management. Since there is a seasonal fluctuation in refuse generation by the resident population (high in 2nd and 3rd quarters, lower in 1st and 4th quarters) and the tourist influx peaks in summer, the County experiences a marked increase of the volumes of refuse between the winter low and summer high. Since refuse cannot be stockpiled or stored raw for any period of time, collection, disposal and processing facilities must be designed and operated to accommodate the peak loads.

Gettysburg College currently has a stabilized enrollment of approximately 2,600 students. The students help to balance the solid waste stream because the college operates while tourist activity is lowest. All public and private schools in the County have a similar impact.

Gettysburg Hospital provides medical services for most of Adams County and a small portion of northern Maryland. Hospitals, ready care centers, and retirement home/nursing home institutions generate some

specialized wastes (infectious/chemotherapeutic) which cannot be placed in the municipal solid waste system. These types of medical wastes are generally managed by companies specializing in the treatment and disposal of such wastes, which are regulated separately by the Pennsylvania Department of Environmental Protection.

1.1.4.3 Regional Influences

As previously mentioned, Adams County is situated on the western fringe of the east coast metropolitan area once referred to as “megalopolis”. The proximity of urban activities naturally impacts the County in a number of ways, and these are generally considered good or bad depending upon a personal point of view.

Although some industrial activities contribute to the municipal solid waste stream, individual industrial wastes (residual wastes) do not impact the Municipal Solid Waste Management Plan under preparation. Industry is individually responsible for the proper disposal of residual wastes generated, and they may or may not be permitted to dispose of those wastes in a facility handling municipal wastes.

Agricultural activities in the County generate considerable volumes of animal and vegetative wastes. Agricultural wastes also fall within the definition of residual wastes. Most agricultural wastes are processed and disposed of on-farm and, if proper procedures are followed, land disposal of agricultural wastes is the most logical and effective means available. Problems occur when the volumes of wastes, particularly manure, exceed the capacity of available land to accommodate disposal. Under Phase Three of the Chesapeake Bay Watershed Implementation Plan for Adams County, manure, along with commercial fertilizer, has been determined to be a major contributor of nitrogen pollution to the Chesapeake Bay.

Agricultural waste disposal problems fall into two categories. First is the nutrient concentration problem as described above. Second is the improper handling of wastes, either during storage or during land application. Animal wastes allowed to accumulate, where subsequent saturation with water and rapid runoff can occur, typically produce high levels of nutrient loss to nearby streams. This results in a loss of fertilizer for the farmer and produces degradation of stream quality. Along the same lines, manures and sewage sludges should not be applied to saturated, frozen, or snow-covered fields. This activity substantially increases the chances of the materials being flushed into streams. There are farms that do not have adequate storage capacity to hold the manure generated during extended periods of time, and are thus tempted or required to apply it at inappropriate times, or to areas that are vulnerable to runoff. Manure utilization is a problem of increasing concern to Adams County, and efforts are underway in working with the agricultural community to try and reduce these pollutants through the implementation of a number of Best Management Practices.

Public and semi-public land uses in Adams County include a variety of activities ranging from the National Park Service complex to churches and other relatively small facilities. Institutional uses, such as Gettysburg College, Gettysburg Hospital, the Adams County Courthouse Complex, the Adams County Adult Correctional Facility, and the Adams County Human Services Building all fall into this category.

Although the Gettysburg National Military Park, National Cemetery, and Eisenhower Historic Site do not generate unusual amounts of solid wastes, they are directly responsible for attracting tourists that patronize commercial facilities. Tourists contribute substantially to the solid waste stream in Adams County. Over 1.2 million tourists visit the National Military Park attractions annually, while overall Adams County entertains nearly 3.4 million visitors each year. It is important to note that through the marketing efforts of Destination Gettysburg, many of these visitors are now staying longer than one day.

Three large retirement home complexes are located in the County. The Spiritrust Lutheran Home just north of Gettysburg, the Cross Keys Village/The Brethren Home Community near New Oxford, and Paramount Senior Living in South Mountain near Caledonia, continually alter their operations and expand as Federal and State regulations change and the demand for facilities increases. There are also a number of smaller complexes located near Gettysburg. As the elderly portion of the population increases, facilities of this nature can be expected to increase in size and number.

In addition, there are a number of age-restricted housing developments near Gettysburg, such as the Preserves of Cumberland Village, and a new 2000-home location called Amblebrook (with a projected 200 homes being constructed annually until build-out is completed).

1.1.4.4 Transportation Network

Rail service in Adams County consists of a Western Maryland Freight Line crossing the County from east to west, and the Gettysburg Branch Line that begins at Gettysburg and exits the County to the north. Both lines provide freight service within Adams County.

It is doubtful that rail service will play a role in the Adams County Municipal Solid Waste Management Plan. However, rail service could become important in the unlikely scenario where the disposal option selected would be delivery to a more distant disposal site accessible directly by rail.

The Adams County highway system is a vast web-like network of State and municipal roads. Except for some remote forested areas in Western Adams County, it is virtually impossible to find a point that is more than one mile from a public road. There are many miles of private roads, some of which are comparable to the quality of public roads.

Although Adams County is not directly served by the Interstate Highway System, Route 15 and Route 30 provide relatively rapid access to the Interstate System to the north, east, south, and west. Passing through the County in a general north-south direction, Route 15 and in an east-west direction, Route 30 (also called the Lincoln Highway) carry heavy volumes of truck traffic. Significant increases in overall traffic occur along Route 15 and Route 30 during the tourist season.

1.2 POPULATION

Population projections can be used to develop future waste generation figures, to assist with solid waste management planning. Total waste generation is normally presented on a per-person (per capita) basis, thus population figures may provide a reasonable guide to future waste quantities that must be accommodated. The best and most readily available database used for population projections for Adams County municipalities are County building permits. Building Permit data is analyzed to determine the number of residential units that might be expected to develop in the future. By applying a people-per-unit multiplier, future population numbers are generated.

The County population for year 2010 is 101,407, based on U.S. Census data. Table 1-2 presents the projected populations of each municipality. The 2015 through 2030 population projections are from the Adams County Office of Planning and Development. These figures represent preliminary, linear projections, and will be revised during the forthcoming 2020 U.S. Census.

Population projections indicate the County's population will increase at an average annual rate of almost 5 percent.

TABLE 1-2: POPULATION PROJECTIONS

MUNICIPALITY	POPULATION	ESTIMATE	PROJECTION		
	2010 ⁽¹⁾	2015 ⁽²⁾	2020 ⁽²⁾	2025 ⁽²⁾	2030 ⁽²⁾
Abbottstown Borough	1,011	1,018	1,035	1,054	1,074
Arendtsville Borough	952	952	962	984	1,007
Bendersville Borough	641	651	662	694	726
Berwick Township	2,389	2,466	2,643	2,890	3,137
Biglerville Borough	1,200	1,207	1,231	1,254	1,277
Bonneauville Borough	1,800	1,802	1,939	2,087	2,234
Butler Township	2,567	2,650	2,777	2,879	2,982
Carroll Valley Borough	3,876	3,925	4,080	4,320	4,561
Conewago Township	7,085	7,369	7,813	8,436	9,058
Cumberland Township	6,162	6,779	7,400	7,978	8,556
East Berlin Borough	1,521	1,523	1,539	1,603	1,667
Fairfield Borough	507	509	522	536	549
Franklin Township	4,877	4,985	5,114	5,337	5,561
Freedom Township	831	846	869	899	929
Germany Township	2,700	2,833	2,943	3,180	3,417
Gettysburg Borough	7,620	7,680	7,770	7,817	7,865
Hamilton Township	2,530	2,630	2,843	3,073	3,303
Hamiltonban Township	2,372	2,403	2,510	2,618	2,726
Highland Township	943	968	1,029	1,101	1,173
Huntington Township	2,369	2,417	2,489	2,609	2,729
Latimore Township	2,580	2,644	2,702	2,829	2,956
Liberty Township	1,237	1,278	1,354	1,445	1,536
Littlestown Borough	4,434	4,565	4,657	4,850	5,043
McSherrystown Borough	3,038	3,053	3,079	3,111	3,144
Menallan Township	3,515	3,728	3,918	4,165	4,411
Mount Joy Township	3,670	3,827	4,090	4,378	4,666
Mount Pleasant Twp	4,693	4,938	5,133	5,429	5,724
New Oxford Borough	1,783	1,792	1,798	1,808	1,818
Oxford Township	5,517	5,628	5,833	6,150	6,467
Reading Township	5,780	5,933	6,237	6,559	6,880
Straban Township	4,928	5,044	5,208	5,420	5,633
Tyrone Township	2,298	2,343	2,411	2,533	2,655
Union Township	3,148	3,180	3,285	3,421	3,556
York Springs Borough	833	833	848	858	867
Total Population	101,407	104,400	108,721	114,304	119,886

⁽¹⁾ U.S. Census Bureau⁽²⁾ Estimate and Projections from the Adams County Office of Planning and Development (September 2016).

Projections developed for this study are subject to a number of limitations, which could materially alter the figures. The smaller the database, the greater the possibility of error and the magnitude of error. Therefore, the figures for the County as a whole have a higher degree of reliability compared to those for individual municipalities. Projections typically assume no significant changes in economic conditions, or other factors, will occur which materially alter the estimated projections. Substantial economic changes may occur, however, and it is impossible to predict these changes and whether they will have a positive or negative impact on the projections. Finally, it is recognized that the projections provided in this Plan have been estimated solely for use in this Plan.

To summarize, it is anticipated that Adams County will continue to grow at a moderate rate. Growth is likely to occur in Townships adjacent to Boroughs with access to centralized water and sewer service, because much of the vacant land area in the Boroughs has been developed in recent years.

Understanding historical population change is critical to generating population projections that are needed to support many planning activities. Existing population characteristics and projections of future population levels are critical to any planning project, especially for a community facility or service (e.g. municipal solid waste disposal). Population density and distribution may provide insight into existing conditions. The projections provided herein should give a relatively accurate picture of population numbers 10 to 20 years into the future.

Population density, normally expressed in people per square mile, is frequently used to determine the necessity for, or feasibility of, various community facilities or services. However, in the case of individual Adams County municipalities, density figures alone do not necessarily provide an accurate spatial picture. Many large municipalities, having very low overall densities, have significant developed areas yielding sometimes misleading population density figures. For instance, both Straban Township and Cumberland Township (Cumberland Township contains a significant portion of the National Military Park lands) have densities of under 200 people per square mile, yet both have major commercial developments, which require the full range of municipal services. Further, housing development in Straban is likely to increase due to job growth and critical location. Table 1-3 provides municipal population density for Adams County.

TABLE 1-3: POPULATION DENSITY

ADAMS COUNTY MUNICIPAL POPULATION DENSITY (2010)			
BOROUGHES	POPULATION	AREA IN SQUARE MILES	POPULATION PER SQUARE MILE
Abbottstown	1,011	0.6	1,685
Arendtsville	952	0.7	1,360
Bendersville	641	0.4	1,603
Biglerville	1,200	0.6	2,000
Bonneauville	1,800	1.0	1,800
Carroll Valley	3,876	5.5	705
East Berlin	1,521	0.7	2,173
Fairfield	507	0.7	724
Gettysburg	7,620	1.6	4,763
Littlestown	4,434	1.6	2,771
McSherrystown	3,038	0.5	6,076
New Oxford	1,783	0.6	2,972
York Springs	833	0.2	4,165
BOROUGH TOTAL	29,216	14.7	1,987
TOWNSHIPS	POPULATION	AREA IN SQUARE MILES	POPULATION PER SQUARE MILE
Berwick	2,389	7.7	310
Butler	2,567	24.0	107
Conewago	7,085	10.5	675
Cumberland	6,162	34.0	181
Franklin	4,877	69.0	71
Freedom	831	14.0	59
Germany	2,700	10.9	248
Hamilton	2,530	13.7	185
Hamiltonban	2,372	39.3	60
Highland	943	12.1	78
Huntington	2,369	25.1	94
Latimore	2,580	21.4	121
Liberty	1,237	16.2	76
Menallen	3,515	43.0	82
Mount Joy	3,670	26.1	141
Mount Pleasant	4,693	31.5	149
Oxford	5,517	10.0	552
Reading	5,780	26.8	216
Straban	4,928	34.4	143
Tyrone	2,298	21.5	107
Union	3,148	17.5	180
TOWNSHIP TOTAL	72,191	508.7	142
COUNTY TOTAL	101,407	523.4	194

1.3 FOCUS OF THIS PLAN

This Plan will focus on the conventional municipal solid waste fraction of the waste stream, and will consider special handling wastes separately from non-special handling waste. Construction and demolition wastes, which are also subject to different handling and disposal considerations from conventional waste (but are regulated as municipal solid waste materials), will likewise be examined separately. This Plan will also separately consider household hazardous waste.

In summary, the Plan will examine each of the following, with primary emphasis on the first three categories in accordance with the 25 Pa. Code Chapter 272, Municipal Waste Planning, Recycling and Waste Reduction statutes:

- (1) Residential, commercial, and institutional waste (i.e. municipal solid waste),
- (2) Sewage sludge (municipal solid waste with special handling considerations),
- (3) Construction and demolition waste (municipal solid waste with special handling considerations),
- (4) Infectious and chemotherapeutic waste,
- (5) Household hazardous waste, and
- (6) Other municipal solid wastes (i.e. waste tires, leaf & yard waste, bulky waste).

The Adams County Plan provides for adequate disposal capacity during the 10-year planning period, 2019 through 2028, for County-generated municipal solid waste. In addition, the Plan places a greater emphasis on the diversion of recyclable materials from the waste stream through a variety of means, such as: enhancing educational efforts, refining reporting methods, promoting food gleaning efforts, seeking new opportunities, encouraging partnerships, working with municipal officials through waste collection contracting efforts, and working with the Adams Rescue Mission to support ongoing recycling services.

1.3.1 Municipal Waste

Municipal waste is defined in 25 Pa. Code §271.1 of the PA Municipal Waste Management Regulations (Regulations) as:

"Garbage, refuse, industrial lunchroom or office waste and other material, including solid, liquid, semisolid or contained gaseous material resulting from operation of residential, municipal, commercial or institutional establishments and from community activities; and sludge not meeting the definition of residual or hazardous waste under this section from a municipal, commercial or institutional water supply treatment plant, wastewater treatment plant or air pollution control facility."

Any material meeting the definition of residual waste, hazardous waste, or source-separated recyclable material, is not a municipal waste under the regulations.

1.3.1.1 Special Handling Wastes

Within municipal waste are certain waste materials which, because of their quantity or unique physical, chemical, or biological characteristics, are subject to additional PADEP storage, collection, transportation, processing, or disposal requirements. Sewage sludge is defined by PADEP as a special handling waste.

The other wastes classified by PADEP as special handling waste are dredged material, infectious waste, chemotherapeutic waste, ash residue from municipal waste incinerators, friable asbestos containing waste, PCB containing waste, and waste oil that is not hazardous. A "permit modification" is required by a municipal waste facility to receive special handling wastes for disposal from a specific source.

1.3.2 Source-Separated Recyclable Materials

Source-separated recyclable materials are defined under 25 Pa. Code §271.1 of the Regulations as:

"Materials that are separated from municipal waste at the point of origin for the purpose of recycling. The term is limited to clear glass, colored glass, aluminum, steel and bimetallic cans, high-grade office paper, newsprint, corrugated paper, plastics and other marketable grades of paper. "

These materials are not subject to regulation as municipal solid waste.

1.3.3 Special Event (Community Activities) Recycling

The term "Community Activities" is defined under 25 PA Code §271.1 of the Regulations as:

"Events sponsored in whole, or in part, by a municipality, or conducted within a municipality and sponsored privately, which include, but are not limited to, fairs, bazaars, socials, picnics and organized sporting events that will be attended by 200 or more individuals per day."

Section 4.6.4 provides information on Special Event Recycling in Adams County.

1.3.4 Residual Waste

Residual waste is defined under 25 Pa. Code §271.1 of the Regulations as:

"Garbage, refuse, other discarded material or other waste, including solid, liquid, semisolid or contained gaseous materials resulting from industrial, mining and agricultural operations; and sludge from an industrial, mining or agricultural water supply treatment facility, wastewater treatment facility or air pollution control facility, if it is not hazardous. The term does not include coal refuse as defined in the Coal Refuse Disposal Control Act. The term does not include treatment sludges from coal mine drainage treatment plants, disposal of which is being carried on under and in compliance with a valid permit issued under the Clean Streams Law."

In short, residual waste is non-hazardous solid waste produced by industrial processes such as manufacturing, mining, food processing, and by agricultural operations. It may be a solid, liquid or gaseous material. It does not include wastes from normal farming activities, sanitary sewage sludge, construction and demolition debris, or certain types of coal mining wastes. It also does not include wastes identified as hazardous.

Examples of residual wastes may include contaminated soil, pesticides, fertilizers, detergents and cleaners, etc.

Residual waste may be disposed at a permitted "captive" disposal facility (a disposal facility at the site of waste generation), land applied at permitted sites (food processing and agricultural residues), or disposed at a municipal waste landfill, provided the landfill has obtained a modification to accept the waste. The modification is approved on a case-by-case basis by the PADEP.

1.3.5 Hazardous Waste Generation

Hazardous Waste is defined in 25 Pa. Code § 271.1 of the Regulations as:

“Garbage, refuse or sludge from an industrial or other wastewater treatment plant; sludge from a water supply treatment plant or air pollution control facility; and other discarded material, including solid, liquid, semisolid or contained gaseous material resulting from municipal, commercial, industrial, institutional, mining, or agricultural operations, and from community activities; or a combination of the above which, because of its quantity, concentration or physical, chemical or infectious characteristics may do one of the following:

- (i) Cause or significantly contribute to an increase in mortality or increase in morbidity in either an individual or the total population.
- (ii) Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed.”

Some wastes may also be deemed hazardous if they have one, or more of the following characteristics: ignitability, corrosivity, reactivity, and toxicity.

Waste meeting the definition of hazardous waste is subject to the stringent regulations under the PA Solid Waste Management Act (Act 97), 25 Pa. Code, Chapters 260-270 and the Federal Resource Conservation and Recovery Act (RCRA). While municipal waste landfills may obtain permit modifications allowing them to receive residual waste, hazardous waste may only be accepted at permitted hazardous waste disposal facilities. Materials that would otherwise be regulated as hazardous waste are considered a municipal waste if generated in the household (household hazardous waste, commonly referred to as HHW). HHW materials would include such items as paint, paint thinner, batteries, used oil, pesticides, computers, TV's, electronic items, etc.

1.4 MUNICIPAL SOLID WASTE GENERATION

This section presents projected quantities of municipal solid waste from Adams County and summarizes the method used to develop these projections. Section 1.4.1 is a brief overview of the estimating method. Section 1.4.2 discusses the estimated composition of the County's municipal solid waste.

1.4.1 Overview of Estimating Method

Table 1-4 identifies the tons of municipal solid waste reportedly received at disposal facilities from Adams County sources in 2017, based on PADEP Waste Destination Reports. These figures do not account for any underreporting, illegal dumping, burning, or composting of waste generated. To calculate the estimated per-capita rate of municipal solid waste generation (i.e., before recycling, composting, burning, or dumping) Adams County used the Pennsylvania Department of Environmental Protection's (PADEP) calculation of 4.75 pounds per-person per-day. Using PADEP's waste generation figure, the tons per-capita, per-year equates to 0.85. Using this per-capita rate, together with the 2019 estimated population projection from the Adams County Office of Planning and Development, results in a total estimated residential generation figure of 91,678 tons of municipal solid waste for 2019.

Table 1-4 shows a total of 53,540.1 tons of municipal waste reported as disposed in 2017. This figure, however, includes both residential and commercial sources of municipal waste. To determine the separate approximate quantities of residential and commercial wastes, Adams County used PADEP's municipal waste breakdown (from the April 2003 R. W. Beck Statewide Waste Composition Study) of 54% residential and 46% commercial. Using these calculations, the resulting breakdown of the 53,540 tons of waste disposed in 2017 is: 28,912 tons of residential and 24,628 tons of commercial. If, however, the total estimated generation figure for residential and commercial waste in 2017 is 90,209 tons (2017 population = 106,128 x 0.85 tons), and the estimated residential waste disposal figure is only 28,912 tons, and the estimated commercial waste disposal figure is only 24,628 tons; then it can only be assumed that 19,801 tons of residential waste ($90,209 \text{ tons} \times .54(\%) = 48,713 \text{ tons} - 28,912 \text{ tons}$) and 16,868 tons of commercial waste ($90,209 \text{ tons} \times .46(\%) = 41,496 \text{ tons} - 24,628 \text{ tons}$) is not being generated; is not being properly reported at disposal facilities; is being burned, composted, or illegally dumped; or is not being reported as recycled. It is also quite possible there has been considerable underreporting of waste being processed at transfer station facilities; therefore, Adams County has instituted reporting requirements under a new agreement required of transfer stations accepting Adams County waste beginning in 2019.

TABLE 1-4: REPORTED MUNICIPAL SOLID WASTE RECEIVED

REPORTED MSW RECEIVED FROM ADAMS COUNTY AT DISPOSAL FACILITIES ⁽¹⁾	
DISPOSAL FACILITY	⁽¹⁾ MUNICIPAL WASTE (TONS)
LCSWMA Susquehanna Complex	0.8
Modern Landfill	1,162.5
IESI PA Blue Ridge Landfill	23,153.0
Cumberland County Landfill	7,310.3
Mountain View Reclamation Landfill	9,772.5
York County Resource Recovery Center	12,141.0
Totals	53,540.1

⁽¹⁾ PADEP - County Waste Destination Reports – 2017

Adams County remains a relatively rural area, where over 70% of its residents dwell in less-densely populated townships. The local governments in these townships, for the most part, do not ordain mandatory residential or commercial garbage collection. They also generally do not discourage the burning of waste through ordinances. It should be noted that PADEP's "2003 Statewide Waste Composition Study" determined that the rural areas in the Southcentral Region contribute the lowest fraction of paper (especially office paper, magazines and non-recyclable paper) to the waste materials entering disposal facilities. These rural areas also contribute lower amounts of yard waste and diapers. Paper, yard waste, and diapers are generally the primary materials burned by rural households in Adams County; therefore, it can be assumed that a significant amount of this material is being disposed through burning. Privacy and stolen identity issues are also a factor in many residents choosing to burn, even some residents who have contracted for waste collection services. Although the Adams Rescue Mission and various waste haulers collect office paper waste, newsprint, and mixed paper, few residents recycle paper, with the exception of newsprint and magazines.

Commercial businesses, if unregulated by ordinance and enforcement, may also resort to burning to save on disposal costs. Adams County, through its Department of Protective Inspections, offers assistance to municipalities with regard to enforcement of State regulations concerning littering and dumping incidents, and the burning of waste materials by commercial businesses. Adams County has also added a littering component to its Municipal Solid Waste, Recycling, Littering and Sewage Sludge Transporters Ordinance. The Ordinance restricts placing municipal solid waste on lands not designated to receive such waste. In addition, Adams County will be working with its Department of Emergency Services to update the County's Burn Ordinance to incorporate State regulatory language.

The Year 2017 Act 101 Annual RETRAC Report shows that a total of 45,861 tons of materials were recycled in the County. This quantity of recycled materials (including standard recycling materials, yard waste composting, and other recycled materials) represents approximately 51% of the gross generated quantity of municipal waste. The year 2017 51% diversion rate is projected to remain steady or increase slightly over the next planning period. Adams County instituted better reporting methods during the past decade, and will also be capturing additional data from the new reporting requirements for transfer station facilities. The Adams County Municipal Solid Waste, Recycling, Littering and Sewage Sludge Transporters Ordinance contains reporting requirements for waste transporters and recyclers. Table 1-5 shows Adams County's recycling totals from the period of 2005 through 2017, with comments concerning particular commodities.

TABLE 1-5: ACT 101 REPORTED RECYCLING

ANNUAL ACT 101 RETRAC REPORTED RECYCLING (2005-2017)		
YEAR	TOTAL TONS RECYCLING ⁽¹⁾	COMMENTS
2005	36,172.2	
2006	37,145.1	
2007	49,124.7	Increased glass, paper, plastics, metals (ferrous), organics
2008	35,826.52	
2009	54,918.85	Increased paper
2010	59,023.5	Increased single stream
2011	961,872.44 *	Increased single stream, glass, mixed metals (ferrous)
2012	2,365,620.25 *	Increased single stream, mixed metals (ferrous)
2013	42,065.66	
2014	38,248.69	
2015	41,277.85	
2016	38,575.7	Decreased glass
2017	45,860.57	Decreased glass. Increased single stream, paper, plastics

⁽¹⁾ Annual DEP Act 101 ReTRAC Reporting

* 2011 – 2012 a new scrap metal recycling company opened in Adams County

Table 1-6 shows Adams County's estimated waste generation over the next 10 years. The municipal solid waste estimates have been calculated using yearly County population estimates and the required DEP per capita generation rate of .85 tons per person, per year. This generation rate includes sewage sludge and C&D waste for the purpose of disposal capacity planning. Table 1-6 was included in Adams County's Request for Proposals to solicit sufficient disposal capacity for the next 10-year planning period. Adams County will require an average of approximately 96,000 tons of capacity annually during the next 10-year period beginning in 2019.

TABLE 1-6: ESTIMATED MUNICIPAL SOLID WASTE GENERATION

ESTIMATED ADAMS COUNTY MUNICIPAL SOLID WASTE GENERATION		
YEAR	POPULATION ¹	WASTE GENERATION (TONS) ⁽²⁾
2019	107,857	91,678
2020	108,721	92,413
2021	109,838	93,362
2022	110,954	94,311
2023	112,071	95,260
2024	113,187	96,209
2025	114,304	97,158
2026	115,420	98,107
2027	116,537	99,056
2028	117,653	100,005
TOTAL		957,559
AVERAGE		95,756

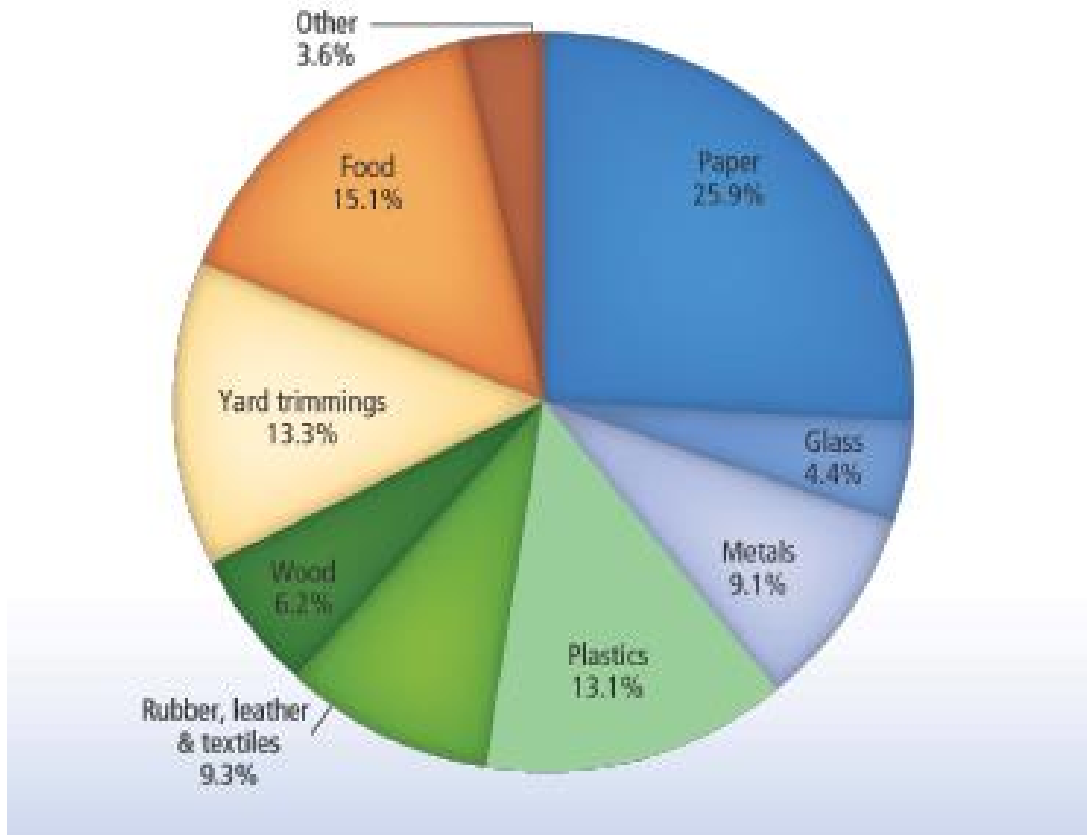
⁽¹⁾ 2019 - 2028 Population Data Projections: Adams County Office of Planning and Development, 2016

⁽²⁾ Projected Waste Generation based on a per capita rate of 0.85 x Population

1.4.2 Municipal Waste Composition

Figure 1-3 shows a breakdown of municipal solid waste generation by material as examined in EPA's *Advancing Sustainable Materials Management: 2015 Fact Sheet*. The waste composition study identified the percentage (by weight) of various materials in typical waste streams across the Country. Municipal solid waste generation in the United States in 2015 totaled 262 million tons.

FIGURE 1-3: MSW GENERATION AND WASTE COMPOSITION IN THE US (2015)



Advancing Sustainable Materials Management: 2015 Fact Sheet (EPA, July 2018)

Mountain View Landfill face/dump area



Additionally, the study presented information on percentages of materials recycled (by weight), and Table 1-7 shows these figures in comparison to the percentages (by weight) of materials recycled in Adams County in 2017.

TABLE 1-7: MATERIALS RECYCLED

MATERIALS RECYCLED (PERCENT, BY WEIGHT RECYCLED COMPARISON)			
MATERIAL	MATERIAL SUBCATEGORY	2015 EPA ⁽¹⁾ %	2017 ADAMS CO, PA ⁽²⁾ %
Paper Paperboard	Newspaper	49.7%	23.3%
	Corrugated Cardboard		
	Office		
	Magazine/Glossy		
	Polycoated/Aseptic		
	Mixed Paper		
Plastics	#1 PET Bottles	3.4%	1.3%
	#2 HDPE Bottles		
	#3 #7 Bottles		
	Expanded Polystyrene		
	Film Plastic		
	Other Rigid Plastic		
Glass	Clear Glass	3.3%	0.0%
	Green Glass		
	Amber Glass		
	Non-recyclable Glass		
Metals	Steel Cans	9.0%	41.6%
	Aluminum Cans		
	Other Ferrous		
	Other Aluminum		
	Other Non-Ferrous		
Organics	Yard Waste – Grass	31.4%	11.8%
	Yard Waste – Other		
	Wood – Unpainted		
	Wood – Painted		
	Food Waste		
	Textiles		
	Other Organics		
Inorganics	Electronics	3.2%	14.1%
	Carpet		
	Drywall		
	Other C&D		
	HHW		
	Other Inorganics		
	Furniture		
Other Recycling (Single Stream/ Commingled) ⁽³⁾			7.9%
TOTAL		100%	100%

⁽¹⁾ Source: EPA Advancing Sustainable Materials Management: 2015 Fact Sheet. All values shown in this Table are estimates.

⁽²⁾ Adams County's waste composition (based on 2017 weights from Act 101 Reporting).

⁽³⁾ Includes Recycled Glass Containers

1.5 CONSTRUCTION AND DEMOLITION WASTE GENERATION

Based on PADEP Waste Destination Reports, 9,139.6 tons of construction and demolition (C&D) waste was generated in Adams County and disposed at Pennsylvania landfills in 2017. This equates to approximately 0.10 tons per capita disposed per year. Construction and demolition waste was disposed at the following facilities in 2017: Modern Landfill, IESI Blue Ridge Landfill, Cumberland County Landfill, LCSWMA – Susquehanna Complex, the York County Resource Recovery Center and the Mountain View Reclamation Landfill. C&D waste disposal is expected to reflect Adams County's population growth trend, and in accordance with long-term trends increase at a very moderate rate.

It should be noted that C&D waste such as uncontaminated bricks, concrete, and asphalt are potentially recyclable, and can be utilized in landscaping applications, manufacturing of products, or as clean fill material. Signs advertising clean fill wanted can be found along many Adams County roadways. An undetermined volume of C&D waste materials are also diverted from the County's wastestream through recycling, dumping, reuse, or burning. In addition, underreporting has most likely occurred at several transfer station facilities that will be addressed in the future with new data reporting requirements.

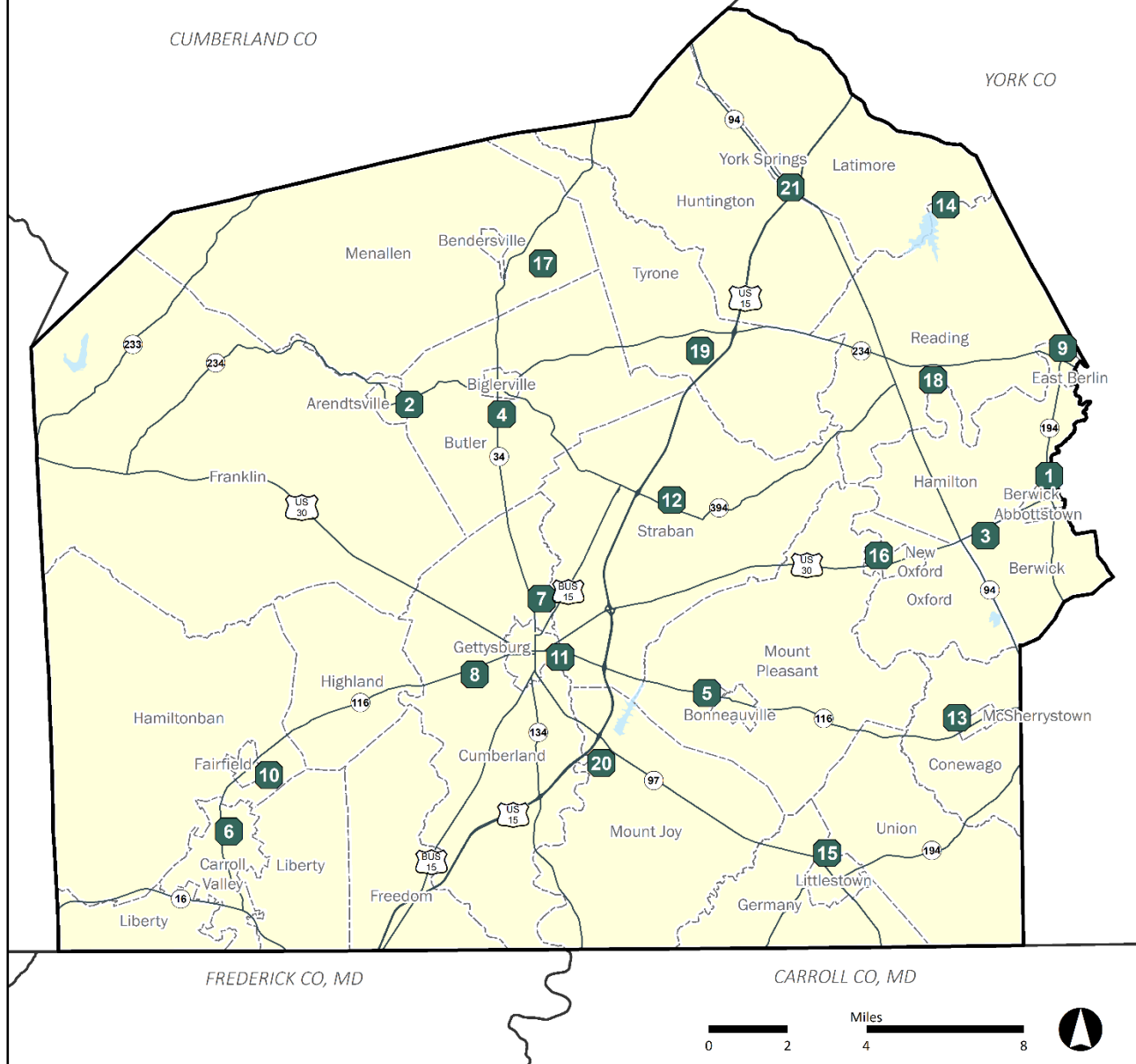
1.6 SEWAGE SLUDGE GENERATION

1.6.1 Municipal Wastewater Treatment Facilities




Adams County has 21 operating municipal wastewater treatment plants, and no proposed new municipal wastewater treatment facilities. These municipal treatment and collection systems service approximately 25 municipalities in Adams County, and 3 municipalities in York County (the Borough of Hanover, Paradise Township, and Penn Township). Figure 1-4 shows the location of municipal wastewater treatment facilities in Adams County.


In order to obtain data on each source of sewage sludge generation, municipal wastewater sewage sludge surveys were updated in 2011, 2015, and 2018 for the identified municipal (publicly-owned) wastewater treatment plants in the County. Municipal wastewater survey results are presented in Table 1-8.

FIGURE 1-4: WASTEWATER TREATMENT FACILITIES
SOLID WASTE WASTE MANAGEMENT PLAN
 ADAMS COUNTY, PENNSYLVANIA



MUNICIPAL WASTEWATER TREATMENT FACILITIES

-  Major Road
-  County Boundary
-  Municipal Boundary

-  Wastewater Treatment Plant
- 1. Abbottstown-Paradise Joint Authority
- 2. Arendtsville Municipal Authority
- 3. Berwick Township Municipal Authority
- 4. Biglerville Borough Authority
- 5. Bonneauville Borough Municipal Authority
- 6. Borough of Carroll Valley Authority
- 7. Cumberland Township Authority - North

- 8. Cumberland Township Authority - South
- 9. East Berlin Area Joint Authority
- 10. Fairfield Municipal Authority
- 11. Gettysburg Municipal Authority (GMA)
- 12. GMA - Hunterstown
- 13. Hanover Borough WWTP - Conewago
- 14. Lake Meade Municipal Authority
- 15. Littlestown Borough Authority
- 16. New Oxford Municipal Authority
- 17. Possum Valley Municipal Authority
- 18. Reading Township Municipal Authority
- 19. Tyrone Township
- 20. White Run Municipal Authority
- 21. York Springs Municipal Authority



TABLE 1-8: SEWAGE SLUDGE GENERATION & DISPOSAL

ADAMS COUNTY MUNICIPAL WASTEWATER TREATMENT PLANT SEWAGE SLUDGE GENERATION AND METHOD OF DISPOSAL					
MUNICIPAL WWTP	AVG GALLONS WEEKLY	AVG GALLONS ANNUALLY	AVG WET TONS WEEKLY	AVG WET TONS ANNUALLY	METHOD OF DISPOSAL: OUT-OF-COUNTY WWTP/ LAND APPLICATION/ LANDFILL
Abbottstown-Paradise	15,220	791,440			OOO WWTP / Land Application
Arendtsville	4,385	228,000			Land Application
Berwick	8,400	436,800			OOO WWTP / Land Application
Biglerville	5,500	286,000			Land Application / Mountain View Landfill
Bonneauville	11,000	572,000			Land Application
Carroll Valley	5,000	260,000			OOO WWTP
Cumberland North/South	28,350	1,474,200			Land Application
East Berlin	5,000	260,000			OOO WWTP
Fairfield	2,405	125,060			OOO WWTP
Gettysburg/Hunterstown			50	2,600	Land Application
Hanover			54	2,808	Land Application
Lake Meade	5,091	264,732			Land Application
Littlestown			9	468	Modern Landfill
New Oxford			32	1,664	Land Application / Modern Landfill
Possum Valley+	2,000	104,000			Land Application
Reading	1,887	98,124			Land Application
Tyrone	1,100	57,200			Land Application
White Run	5,500	286,000			Land Application
York Springs	3,300	171,600			Land Application
Totals	104,138	5,415,156	145	7,540	

Adams County facilities generate nearly 5.5 million gallons of liquid sewage sludge and 7,500 solid tons of sewage sludge annually. Most facilities have expressed concern over the long-term cost of disposal options. The majority of the sewage sludge within Adams County is generated from the central and eastern regions of the County.

The total quantity of sewage sludge produced from the municipal treatment facilities in Adams County is disposed either in liquid form or solid form, and is primarily land applied in-County or out-of-County at various permitted sites. Some solid form sewage sludge is landfilled out-of-County during wet or winter months when land sites are not accessible. The remaining liquid sewage sludge is transported to out-of-County treatment facilities for disposal.

1.6.2 Non-Municipal Wastewater Treatment Facilities

In addition to the municipal treatment/collection systems, there are also approximately 25 non-municipal sewage treatment systems in Adams County. It is interesting to note that PA American Water, a private company, purchased and combined two former municipal treatment systems (Franklin Township and Hamiltonban Township). These facilities are listed in Table 1- 9. Generally, the sewage sludge generated by many of these facilities is disposed by private septage haulers at out-of-County wastewater treatment plants and land application sites.

TABLE 1-9: NON-MUNICIPAL WASTEWATER TREATMENT PLANTS

Permitted Non-Municipal Wastewater Treatment Plant Locations:

- Anchor Mobile Estates
- Artillary Ridge Campground
- Castle Hill Mobile Home Park
- Bermudian Springs High School
- Calvary Heights Mobile Home Park
- Chesapeake Estates
- Cuttin Company Sewage Treatment Plant
- Eisenhower Wastewater Treatment Facility
- Flatbush Golf Course
- PA American Water Company
- Freedom Valley Worship Center
- Gettysburg Battlefield Resort Sewage Treatment Plant
- Hoffman Homes Inc
- Keller Farm Subdivision/Planks Field Sewage Treatment Plant
- Aqua Pennsylvania Wastewater Treatment Plant
- Middle Creek Bible Conference
- Morton Building Manufacturing Plant
- MountainView Mobile Home Park
- New Oxford Mobile Home Park
- Paramount Senior Living Fayetteville Sewage Treatment Plant
- Pine Run Mobile Home Park
- Round Top Campground
- SFS Ponderosa Trailer Park
- Summit Ridge Sewage Treatment Plant
- Yingling Development

1.6.3 Septage

Septage generated in Adams County must be disposed of at a permitted disposal site. (See Section 6.2, Waste Disposal Sites, for a listing of reported permitted disposal sites utilized by Adams County haulers.) Disposal sites receiving septage from Adams County include permitted agricultural fields and municipal wastewater treatment facilities, located primarily outside of the County. With the exception of a few wastewater treatment plants that accept septage from a limited number of households (some of which are malfunctioning septic systems) located in or near their service area, there are no municipal wastewater treatment plants that accept septage from private haulers in Adams County. There is reluctance in Adams County to accept septage based on the facility upgrades required, the strength of the septage material, and the demands it places on the treatment process. Septage haulers have expressed concerns about the cost of disposal and long-term disposal options. Adams County has supported efforts over the years to investigate the potential for a centralized sewage treatment facility to address these concerns, and will continue to support similar efforts.

Adams County conducted surveys in 2011, 2015, and 2018 in an effort to quantify the amount of non-municipal sewage/septage being disposed. Although there was not a complete survey response in 2018, the information received through these surveys reported the following amounts disposed annually for each survey in Table 1-10.

Table 1-10: NON-MUNICIPAL SEWAGE SLUDGE GENERATION

SEWAGE SLUDGE GENERATION: NON-MUNICIPAL WASTEWATER TREATMENT PLANTS AND ON-SITE SEPTIC SYSTEM PUMPINGS		
REPORT YEAR	TYPE	GALLONS
2011	Residential	3,429,700
	Commercial	815,107
	Grease	156,500
2015	Residential	5,450,300
	Commercial	714,600
	Grease	no report
2018*	Residential	1,595,900
	Commercial	473,350
	Grease	109,200

* The Response to the 2018 Survey was Incomplete, thus the Variation in Total Reported Gallons.

1.6.4 Septage Quantity Estimates

This section describes the estimating method used to estimate the projected quantities of septage in Adams County. Based on Adams County Office of Planning and Development estimates for 2002 (most recent update), there were a total of 34,670 occupied housing units in the County. The County estimated

that a total of 18,288 occupied housing units were connected to public sewers and a total of 15,382 units were connected to on-lot septic systems. Based on the ratio information developed from the occupied housing data listed above, it was estimated that 53% of the total housing units in Adams County were connected to, or had access to, public sewer service. It was estimated that another 1,000 housing units were connected to private sewer systems. It should be noted though, the U.S Census information for 2017 estimated Adams County occupied housing units increased to 38,818 (12% increase), with condensed development sites continuing reliance on public and private sewer systems.

The average number of people per occupied housing unit in the County in 2002 was 2.77 (95,875 Year 2002 population / 34,670 occupied housing units). Using this information, it was estimated that 42,608 people in Adams County were using on-lot sewer systems (15,382 occupied units with on-lot systems x 2.77 people per occupied unit), which represented approximately 44% of the County population. It is assumed that this percentage has remained fairly constant through the past decade.

To determine the volume of septage produced in Adams County, a number of factors were considered: total number of housing units with septic systems, number of persons per housing unit, and the size of the septic tank. According to the Pennsylvania State University's Agricultural and Biological Engineering Fact Sheet – Septic Tank Pumping (F161), Pennsylvania law states that a 900-gallon tank is the minimum size required for a home with three bedrooms or less. Based on this fact sheet, a 900-gallon septic tank servicing a household of three persons should be pumped every 3.3 years.

Using 2.77 people per occupied housing unit on septic systems, in conjunction with information presented in the Fact Sheet, a 900-gallon septic tank in Adams County should be pumped every 3.7 years. If this pumping frequency is applied to all septic systems in Adams County, it is estimated that an average of approximately 3,741,567 gallons of septage would be pumped annually from septic tanks in the County (15,382 septic systems x 900 gallons/3.7 years pumping frequency). This is equivalent to about 88 gallons per year of septage generated per capita for County residents served by septic systems (3,741,567 gallons septage/15,382 occupied units with on-lot systems x 2.77 people per occupied unit). It is important to note, however, that to date only ten municipalities have enacted sewage management districts, which require septic tanks to be pumped on a three-year basis. A recommendation of the Adams County's Phase III Watershed Implementation Plan is for all municipalities to implement requirements for on-lot septic system maintenance and pumping.

Please note, when comparing the above septage generation estimates to non-municipal sewage/septage information obtained from surveys, the survey information also includes waste from private wastewater treatment facilities.

1.6.5 Septage and Sludge Projections

Using the County population projections from Table 1-6, and conservative assumptions of a constant percentage of the County population served by septic systems in the future (44%), and a constant per capita septage generation rate (88 gallons per capita per year), the projections of septage quantities through 2028 can be computed. These are presented in Table 1-11.

Total sewage sludge generation for the County was determined using the reported wastewater treatment plant sewage sludge generation volumes from the detailed 2003 WWTP Survey. The reported municipal wastewater sewage sludge generation in 2002 was 33.9 dry tons per week (approximately 1,763 dry tons per year). County population served by municipal wastewater treatment plants was estimated at 50,658 in 2002. The per capita sewage sludge generation rate, based on dry tons per capita generation of sludge for Adams County, was 0.035 dry tons per year (1,763 dry tons per year/50,658 persons served by public

sewer). Based on population projections, and assuming a conservative and constant percentage of the County population served by municipal wastewater systems in the future (53%), and assuming a conservative and constant per capita sludge generation rate (0.035 dry tons per capita per year), projections of sludge quantities through 2028 can be computed. Projections of sewage sludge and septage generation quantities are presented in Table 1-11.

What these conservative generation figures show is an increasing amount of waste materials needing to be disposed over the next decade. With the primary means of disposal of this waste occurring at land application sites both in-County and out-of-County, there is concern in regard to the long-term feasibility of land application within the Chesapeake Bay Watershed region, as the emphasis continues on nitrogen and phosphorus reduction efforts.

Table 1-11: SEWAGE SLUDGE AND SEPTAGE GENERATION PROJECTIONS AND QUANTITIES

SEWAGE SLUDGE / SEPTAGE GENERATION	2019	2020	2021	2022	2023
Projected Population	107,857	108,721	109,838	110,954	112,071
Estimate Served By Treatment Plants	57,164	57,622	58,214	58,806	59,398
Plant Dry Tons/Year	2,001	2,017	2,037	2,058	2,079
Estimate Served By On-Lot Septic Systems	47,457	47,837	48,329	48,820	49,311
Systems Gallons/Year	4,176,216	4,209,656	4,252,952	4,296,160	4,339,368

SEWAGE SLUDGE / SEPTAGE GENERATION	2024	2025	2026	2027	2028
Projected Population	113,187	114,304	115,420	116,537	117,653
Estimate Served By Treatment Plants	59,989	60,581	61,173	61,765	62,356
Plant Dry Tons/Year	2,100	2,120	2,141	2,162	2,182
Estimate Served By On-Lot Septic Systems	49,802	50,294	50,785	51,276	51,767
Systems Gallons/Year	4,382,576	4,425,872	4,469,080	4,512,288	4,555,496

1.7 INFECTIOUS AND CHEMOTHERAPEUTIC WASTE

Infectious and chemotherapeutic waste constitutes a very small portion of the municipal waste generated in Adams County. To date, no tonnages have been reported for infectious and chemotherapeutic waste in PA DEP Waste Destination Reports.

The principal generators of infectious and chemotherapeutic waste are Wellspan Gettysburg Hospital and related centers, physician offices, geriatric nursing facilities, veterinarian offices, and other County-related medical and dental facilities. These establishments generate the majority of infectious and chemotherapeutic waste in the County. Contaminated bandages, dressings, and surgical equipment are some of the common materials reported as infectious and chemotherapeutic waste types.

It should also be noted that there has been an increasing trend to provide in-home medical care. The concern of infectious waste entering the municipal waste stream (e.g. needles from diabetic treatment, which is on the rise) has also been heightened as an increasing number of patients receive treatment at home and are left with the responsibility to properly dispose of medical waste that could potentially be a threat to public safety. After hearing from many residents that needle disposal was of great concern to them, the Adams County Office of Planning and Development, in partnership with Healthy Adams County (an affiliate of Wellspan), the Adams Regional Emergency Medical Service, the Adams County Department of Emergency Services, and Collaborating for Youth began working on a community solution to address the problem. It is anticipated that a new community drop-off disposal option will become available to residents sometime in 2019. The project funding, management structure, and long-term maintenance plan are being finalized.

Another growing waste threat is outdated medications. Improper disposal methods, such as flushing medications into on-lot systems or municipal treatment systems, have the potential to cause groundwater and surface water pollution (See 1.8 HHW Section.) Adams County helped launch the National Medicine Take Back program, and since 2010 has disposed of 12,000 pounds of medications and pharmaceuticals through twice yearly drop-off events. In addition, Adams County and its partners have worked with local law enforcement agencies to institute secure permanent drop-off sites at nine different locations throughout the County. All of the materials collected are disposed through incineration at a permitted facility. (See the Adams County Recycling and Waste Management Information Brochure.)

1.8 HOUSEHOLD HAZARDOUS WASTE

Household hazardous waste (HHW) constitutes a small fraction of the municipal waste stream (less than 0.5 percent according to the PADEP). Because of its chemical or biological nature, it is potentially hazardous to humans and the environment. The U.S. Environmental Protection Agency (EPA) classifies waste as hazardous if it is toxic, corrosive, ignitable, or reactive. There are numerous Federal and State statutes that regulate hazardous wastes, but the disposal of hazardous waste from households is exempt from these regulations. PADEP requires that HHW be addressed in county solid waste plans. Adams County does not have a household hazardous waste program. However, there are various locations in the County and outside of the County that will accept items such as used oil, anti-freeze, rechargeable batteries, fluorescent bulbs, mercury thermostats, etc. for disposal. There are also various mail-back programs available, for a fee (See the Adams County Recycling and Waste Management Information Brochure). Adams County refers individuals with large quantities of old paint materials to be disposed to

the York County Resource Recovery Center. The County will continue to seek partnerships with other municipalities, or organizations, to provide for the proper handling and disposal of these materials.

Adams County worked in partnership with the Adams Rescue Mission after the enactment of the Covered Device Recycling Act in 2010 to establish an electronics recycling drop-off site at the Mission's recycling center. This partnership was extremely successful until State funding sources became insufficient to sustain the program. The Mission stopped taking electronics in 2015 and Adams County municipalities



grappled with illegal dumping of covered devices along roadways and in streams. Residents were encouraged to store items until a solution could be found. In 2017, Adams County and the Adams County Council of Governments raised funds to hold a one-day drop-off event at a County location. The event was a tremendous success for the community and additional planning was conducted for another event. Meanwhile, Adams County was also preparing contract documents for a Joint Municipal Waste Collection Bid. After discussion with various waste collection companies operating within

Adams County, it was decided to add covered device recycling as a component of the Bid. Eighteen municipalities are now benefitting from quarterly covered device drop-off events within their various regions. Additionally, one municipality (McSherrystown) has access to York County's electronic recycling program, and two additional municipalities provide separate programs for their residents. All other municipalities are referred to available drop-off programs in Cumberland and Franklin counties, as well as one certified company located in the Frederick, MD area.

Although the disposal of HHW is not subject to special regulations, there are a number of reasons why safe handling and disposal are important. Traditionally, these wastes have been disposed as ordinary trash in municipal waste landfills, poured down drains, or stored in garages or basements. When HHW is disposed as municipal waste, there is a potential health hazard to waste handlers or haulers. Large amounts of hazardous waste disposed down drains may cause septic tank failure, may upset sewage treatment plant effluent requirements, or may pass through the system and contaminate a downstream drinking water source. With the development of new technologies and higher standards of living, the volumes of HHW have increased, and many municipalities and local governments are now evaluating options for safer handling and disposal of HHW. Act 101 requires operators of resource recovery facilities to develop programs to remove hazardous materials from municipal wastes. The Act also requires recycling of lead acid batteries, which are prohibited from disposal directly into landfills. Lead-acid battery wholesalers and retailers are required to take used acid batteries from customers, in a quantity at least equal to the number of new batteries purchased. In addition, several local scrapyards and stores accept used lead-acid batteries.

1.9 RESIDUAL WASTE

The quantity of residual waste generated in Adams County was determined by reviewing the 2017 PADEP County Waste Destinations Reports from area landfills. The total tonnage of residual waste disposed at approved disposal facilities in 2017 was 10,650 tons. Additional quantities of residual waste from Adams County may be disposed in captive facilities owned by private industry, or in other disposal sites located out-of-County, or land applied at permitted sites. Residual waste is not managed by Adams County.

1.10 WASTE TIRES

Adams County, in partnership with the Adams County Conservation District (ACCD), has held successful tire collection events almost annually, with partial funding from the Department of Environmental Protection. Over the past decade, Adams County has recycled over 24,000 tires through these events. The County will continue its partnership efforts with the ACCD to pursue sources of funding in the future in order to provide similar collection programs. It is important to note that several nearby facilities accept tires for a fee (See the Adams County Recycling and Waste Management Information Brochure).



In addition, 21 municipalities have signed contracts for residential waste collection that provides for disposal of one tire (or other bulky item) per week placed at the curb. McSherrystown Borough residents can also dispose of one tire per week as part of their contract with York County.

1.11 LEAF AND YARD WASTE

Several municipalities in Adams County collect leaf and yard waste through curbside collection and drop-off recycling sites. (See Section 4.8.6, Adams County Initiatives in Yard Waste Management.)

Many homeowners opt to compost such materials on-site. The Penn State Cooperative Extension Master Gardener Program has provided home composting educational programs since 1999. Over 800 composting bins have been distributed through these programs.

In total, approximately 5,390 tons of leaf and yard waste were reported as collected in Adams County in 2017. Most of this material was made into mulch, composted, or applied to farmland.

The remainder of leaf and yard waste materials generated within the County are assumed to be disposed of on-site, dropped off at several local and out-of-County locations handling such materials, mixed with regular waste for pick-up, burned, or illegally dumped (in rural areas such as Micheaux State Forest.) The Adams County Recycling and Waste Management Information Brochure contains a listing of the locations accepting these materials. Adams County will continue to encourage and assist municipalities with implementing leaf and yard waste programs, and has worked with the Adams County Council of Governments to survey municipalities regarding joint efforts in the management of these materials. A number of years ago, Adams County stepped up to assist Gettysburg Borough when they lost their composting and land application site for leaves. The Adams County Correctional Facility now utilizes the leaves from a passive composting process to enhance the soils of their facility gardening program.

All recycling activities undertaken by the Adams County Office of Planning and Development will continue to be performed in full compliance with applicable regulations, including the Permit-by-Rule Guidelines for Yard Waste Composting Facilities. DEP was contacted to assist several municipal entities in gaining approval (permit-by-rule) for their yard waste composting operations. PADEP's Permit-By-Rule Program for yard waste composting site permitting and operation is discussed in Section 4.8.1 of this Plan.

1.12 BULKY WASTE

Several options exist for the handling, recycling, or disposal of bulky waste items (white goods). Twenty-two municipalities have signed contracts for waste collection that allow for collection of one bulky waste item per week at curbside. Several small haulers operating in the County will pick up bulky items for a fee. A few municipalities continue to sponsor spring or fall clean-up days during which they accept bulky waste items for disposal. Additionally, individuals can transport these items to various nearby scrap yards, or designated transfer or disposal facilities.

1.13 FOOD WASTE RECOVERY

According to the South Central Community Action Programs, Inc (SCCAP) Gleaning Project, 20 percent of the food grown never leaves the farm. Since 2012 SCCAP has organized and managed a program to collect and distribute usable foods from various farms and provide it to community members in need. The most recent statistics from the 2017 and 2018 harvest seasons account for 150,000 to 200,000 pounds of rescued fruit and vegetables recovered for consumption. The SCCAP Gleaning Project also gleans unwanted perishable foods from local farmer markets and local food stores.

It is estimated by the United States Department of Agriculture that 30 to 40 percent of food is wasted and disposed. In order to combat the waste of usable food in Adams County, Gettysburg College organized the first Campus Kitchen Project in Pennsylvania in 2007. Since that time, the Project has rescued and repackaged prepared foods from the campus dining services, restaurants, hotels, and caterers to be distributed throughout the community. To date, 110,928 pounds of food have been recovered, and 57,260 meals served.

There is also a significant amount of residual food wastes that are reused in the County through distribution to area farmers or through application to farmlands.

CHAPTER 2 | EXISTING WASTE MANAGEMENT SYSTEM

It is necessary to understand the existing waste management system in Adams County because this knowledge may serve as a baseline from which to create alternative scenarios for future planning and waste management. The existing waste management system may be an indicator of existing problem areas and also an indicator of planning practices that are working well. The first section of this Chapter describes the collection practices for conventional municipal solid waste. The second section describes the disposal and processing facilities that receive MSW generated in the County. Finally, Sections 2.3 - 2.8 describe the collection, processing, and disposal practices for construction/demolition wastes, special handling wastes, and residual waste. Recycling and yard waste composting activities are described in Chapter 4 - Recycling Strategy.

2.1 MUNICIPAL SOLID WASTE COLLECTION

All municipalities in the County, serviced by private collection, have weekly residential collection of refuse. Commercial entities are serviced based on need. At least 22 of the municipalities that bid contracts for weekly waste collection include once-a-week large item, or “bulky item”, pickup as part of the contract. 18 municipalities also include quarterly covered device drop-off events in their collection contracts. One municipality offers an annual, municipally-funded, drop-off covered device event for residents, while another municipality is permitted to participate in York County Solid Waste Authority covered device collections. Other municipalities in Adams County have access to covered device drop-off sites at the Washington Township Transfer Station Facility, Franklin County or the Cumberland County Solid Waste Authority Electronic Recycling Center, as well as one commercial location in the Frederick, MD area.

Tag-a-bag is also an attractive option included under the contracts and is especially preferred by those who generate less waste. There is a requirement for purchase of a minimum number of tags per the contract.

Several municipalities offer bulky item cleanup days, and generally these collections occur once per year, or sometimes twice per year (Spring and Fall). These collections exclude hazardous materials.

Several municipalities also offer curbside or drop-off collection services for yard waste and leaves. In addition, Adams County residents have opportunities to drop-off materials at a number of local and out-of-County sites utilizing such materials (See the Adams County Recycling and Waste Management Information Brochure.)

The following municipalities participate in a jointly bid municipal waste collection contract:

- Abbottstown Borough
- Arendtsville Borough
- Bendersville Borough
- Biglerville Borough
- Butler Township
- Carroll Valley Borough
- Conewago Township
- Cumberland Township
- East Berlin Borough
- Fairfield Borough
- Franklin Township
- Freedom Township
- Gettysburg Borough
- Hamiltonban Township
- Highland Township
- Huntington Township
- Latimore Township
- Liberty Township
- Menallen Township
- Straban Township
- Tyrone Township
- York Springs Borough

The joint municipal waste contract is bid in two ways: per specific region, inclusive of groups of four to six cooperating municipalities that jointly select the level of services and pricing on behalf of their residents; or per municipality and specific services required. Under this joint contract, all municipalities, with the exception of Conewago Township and Gettysburg Borough (both of which are mandatory participation), allow optional participation by residents.

Several additional municipalities bid their own individual contracts for waste collection services.

The Waste Service Information table (Contained in the Appendicies) includes waste collection service and pricing information for all municipalities in Adams County.

Table 2-1 lists the large, full-service refuse haulers operating in Adams County. According to Adams County manifest reports, the nine identified large private haulers disposed of approximately 53,540 tons in 2017. The haulers disposed of Adams County waste at the following facilities: York County Resource Recovery Center, Cumberland County Landfill, Blue Ridge Landfill, Modern Landfill, and Mountain View Reclamation Landfill.

Waste from Adams County is also delivered to the Hanover, Diller, Neiderer Sanitation and Washington Township Transfer Stations; however, historically there may be underreporting on the disposal of that waste. The newly adopted Adams County Municipal Solid Waste, Recycling, Littering and Sewage Sludge Transporters Ordinance requires detailed reporting be made available to the County. In addition, Adams County is also requiring transfer stations to enter into an Agreement with the County to accept County-generated waste and dispose of it at the designated disposal sites in its Plan. This Agreement also contains reporting requirements. (Contained in the Appendicies).

It should be noted that Adams County does not have any in-County waste disposal facilities, and all municipal solid waste is disposed at out-of-County facilities. Neiderer Sanitation Transfer Station is the first waste processing facility to open in Adams County.

In general, any full-service refuse hauler may provide residential, commercial, and institutional waste collection and disposal services, and recycling collection and processing services unless a municipality requires that only the contracted municipal hauler may provide these services. Adams County instituted a hauler licensing program in 1993, but suspended implementation of that particular program in 2008 due

to statewide legal challenges. At that time there were approximately 150 licensed haulers in the program. Many of these haulers were small, private haulers that typically provided general refuse hauling (i.e. residential or commercial) or C&D waste collection (e.g. C&D removal from jobsites) for disposal and processing. Adams County did not require haulers of residual or hazardous waste to obtain a license. Adams County has changed the former licensing program to require registration of transporters of municipal waste under the County of Adams Municipal Solid Waste, Recycling, Littering and Sewage Sludge Transporters Ordinance. The Transporter Ordinance requires the registration of any haulers of municipal solid waste (inclusive of construction/demolition wastes), recycling, and sewage sludge (inclusive of septage). This Ordinance is the mechanism the County utilizes to ensure waste is delivered to those disposal facilities under contract with the County and designated in the County’s Plan.

The Municipal Waste Planning, Recycling and Waste Reduction Act (Act 101), as regulated under Title 25 of the Pa. Code Chapter 272, mandates curbside recycling in communities with a population over 10,000 and in communities over 5,000 with a density of at least 300 persons per square mile. Gettysburg Borough, Conewago Township and Oxford Township are mandated to recycle under Act 101. McSherrystown Borough has also opted to require its residents to recycle.

TABLE 2-12: MAJOR MUNICIPAL WASTE HAULERS

MAJOR MUNICIPAL WASTE HAULERS IN ADAMS COUNTY

Advanced Disposal
135 Vaughn Road
Shippensburg, PA 17257
(717) 423-5383

Republic Services, Inc.
1110 E. Princess Street
P.O. Box 1401
York, PA 17405
(717) 845-1557

Chambersburg Waste Paper
2047 Loop Road
P.O. Box 975
Chambersburg, PA 17201
(717) 264-4890

Stonesifer & Sons Sanitation, Inc.
791 Sell's Station Road
Littlestown, PA 17340
(717) 359-4627

Neiderer Sanitation
1745 Storms Store Road
New Oxford, PA 17350
(717) 624-7430

Waste Connections
P.O. Box 399
Scotland, PA 17254
(717) 709-1700

Park’s Garbage
11763 Shirley Ayr Road
P.O. Box 218
Mt. Union, PA 17066

Waste Management
9446 Letzburg Road
Greencastle, PA 17225
(717) 597-4056

Penn Waste, Inc.
P.O. Box 3066
York, PA 17402
(717) 767-4456

2.2 MUNICIPAL SOLID WASTE TRANSPORTATION, PROCESSING AND DISPOSAL

Although generally, Adams County waste is hauled directly to one of several out-of-County designated disposal facilities by waste haulers. The following transfer facilities have entered into an agreement with Adams County. These facilities will accept municipal solid waste generated within Adams County for processing and transfer hauling to a designated disposal facility under contract with the County.

2.2.1 Transportation and Transfer Facilities

Hanover Area Transfer Station

The Hanover Area Transfer Station located in Penn Township, York County serves Hanover Borough, the greater Hanover area, individual and commercial accounts. Waste is sent from the transfer station to the York County Resource Recovery Center (YCRRC) under a long-term disposal agreement. The YCRRC facility is a designated facility in this Plan. The Hanover Transfer Station is a compaction-type transfer station that transfers solid waste from collection vehicles to large-capacity transfer vehicles.

Neiderer Sanitation Transfer Station

The Neiderer Sanitation Transfer Station facility is located in Adams County. The facility primarily services the eastern and central portions of Adams County, the western portion of York County, and Neiderer Sanitation's collection service. The facility includes a recycling drop-off area, and accepts municipal solid waste, junk, bulky items, used motor oil, tires, white goods, metals, and automotive batteries for recycling.

Washington Township Transfer Station

The Washington Township Transfer Station is located in Franklin County. The facility service area includes Adams, Franklin, Frederick, and Washington Counties. The facility is an open-top transfer station. Municipal waste can be brought to the transfer station, by anyone, for a fee.

The Transfer Station site includes a recycling drop-off area and a small yard waste composting area. The facility also accepts tires, white goods, junk metal, and yard waste. Adams County residents (and others) may drop-off recyclables at no cost. Washington Township also offers covered device recycling for a fee and allows Adams County residents to participate.

Diller Transfer Station

The Diller Transfer Station is located in Cumberland County. The facility service area includes Adams, Cumberland and Perry Counties. Municipal waste can be brought to the Transfer Station by anyone for a fee. Single stream recyclables are accepted at the facility, as well as metals for recycling.

2.2.2 Description of Disposal and Processing Facilities

2.2.2.1 Permitted Disposal and Processing Facilities

Adams County does not own and/or operate any landfills or transfer stations. For the past 20 +/- years, Adams County has been under contract with the following disposal sites for acceptance of Adams County's municipal solid wastes: Modern Landfill, York County; Blue Ridge Landfill, Franklin County; Mountain View Reclamation Landfill, Franklin; and the York County Resource Recovery Center in York. Cumberland County Landfill became a designated disposal facility approximately five years ago.

At this time, the majority of Adams County waste is disposed at the Blue Ridge Landfill located in Franklin County. 2017 PADEP waste destination reports list the following permitted disposal sites (in-State) that have reported receipt of Adams County waste:

<u>Permit No.</u>	<u>Site</u>
100113	Modern Landfill
100934	Blue Ridge Landfill
100945	Cumberland County Landfill
101100	Mountain View Reclamation Landfill
477506	Susquehanna Resource Mangement Complex
400561	York County Resource Recovery Center

Through a fair and competitive RFP process, Adams County has identified and selected qualified respondents/ facilities to be listed in this Plan as designated disposal sites for Adams County municipal solid waste. Chapter 5 of this Plan describes the process that was used to solicit disposal capacity for Adams County's municipal solid wastes under this Plan. Contracted disposal sites selected in the disposal RFP solicitation and their locations are discussed in Chapter 6 of this Plan. The York County Resource Recovery Center has renewed its long-term disposal contract with Adams County, and is also listed as a designated disposal facility for Adams County. The designated disposal facilities are expected to accommodate Adams County waste until January 1, 2029.

2.2.2.2 Illegal Dumping Activities

Remote, rural, and isolated regions, like portions of Adams County, are prone to illegal dumping activities. In May of 1995, the County distributed an illegal dumping survey form to Michaux State Forest and to all 34 municipalities in the County. Fourteen municipalities and Michaux State Forest completed and returned the survey forms. At the time of the survey, responding municipalities identified eight major illegal dumpsites. The Michaux State Forest reported nine dumpsites at that time in the County. Although the survey results indicated a total of 17 dumpsites were located in Adams County, it is believed that a substantially larger number of dumpsites may exist throughout the County that were not identified during the 1995 survey. The 2009 PA CleanWays Illegal Dump Survey identified 116 dumpsites, primarily in rural areas and along State maintained roadways. Many of these dumpsites have been cleaned up over the years but new incidents of dumping occur regularly.

The Adams County Department of Protective Inspections provides direct support to the Adams County Office of Planning and Development, municipalities, PADEP, and individuals in investigation, monitoring, and prevention of illegal dumping activities. Protective Inspections also enforces provisions of the County of Adams Municipal Solid Waste, Recycling, Littering and Sewage Sludge Transporters Ordinance.

Some **contributing factors** to illegal dumping in the County may be:

- residents illegally dump out of habit or from cultural practice
- solid waste ordinances are either non-existent or ineffective in addressing illegal dumping
- lack of illegal dumping enforcement or monitoring
- existing disposal and recycling opportunities are unknown to residents (education)
- disposal options are unaffordable for residents, or the perception exists that disposal costs are too high

In Adams County there are a variety of **waste disposal and recycling alternatives** available to residents. These disposal options serve as alternative outlets to illegal dumping, and include:

- municipal bid contract hauling and/or recyclables collection services
- individual/private subscription hauling and/or recyclables collection services between homeowner and hauler
- the Adams Rescue Mission offers recycling drop-off service at no cost to residents and businesses
- several municipal drop-off recycling sites
- municipal yard waste drop-off sites
- drop-off disposal sites
- white-goods and bulky item disposal under municipal bid contracts
- Spring/Fall municipal “clean-up” events
- tire disposal opportunities
- scrap yard drop-off locations
- availability of commercial dumpster services

Other related initiatives in the County include the Pennsylvania Department of Transportation’s Adopt-A-Highway Program used to combat litter along State-maintained highways, several municipal Adopt-a-Road programs, the successful from “The Ground Up” volunteer litter abatement program in Gettysburg Borough, and various community service initiatives through the Adams County Probation Department and Manito Day Treatment Service.

In addition, the Forest Lands Beautification Program is administered by the State Department of Conservation and Natural Resources (DCNR) in conjunction with PA CleanWays. PA CleanWays is DCNR’s

cleanup partner under the Program, and has played an important role in dump site cleanups. The Forest Lands Beautification Act, signed into law in December 1998, sets aside funding from the State recycling fund to assist with cleanup activities. Michaux State Forest staff clean up illegal dump sites on an ongoing basis. Some of the larger dumpsites have been cleaned up with the help of PA CleanWays. The Watershed Alliance of Adams County also organizes and conducts stream-side cleanups.

The Adams County Office of Planning and Development has tried, without success, to establish a County Chapter of PA CleanWays, a non-profit organization that fights illegal dumping and littering in Pennsylvania. The Office of Planning and Development has however, worked successfully in partnership with local organizations and individuals to clean up some of the County's larger dumpsites. One of the larger dumpsite cleanups received national recognition for the removal of almost 6,500 tires.

Adams County solicited "free" disposal capacity for material collected from annual community cleanups in the 2018 Request for Proposals (RFP) for waste disposal services. Several disposal facilities responded with free disposal capacity for community events.

A number of Adams County municipalities participate in the Keep Pennsylvania Beautiful (KAB) Great American Cleanup of Pa annual event, cleaning up local roadways and dumpsites in the County. KAB also makes surveillance cameras available to municipalities to combat dumping problems.

Penn State Extension of Adams County has offered backyard composting training as a way to educate residents about composting as a disposal alternative. County recycling programs are discussed in detail in Chapter 4 – Recycling Strategy.

2.2.2.3 Open Burning

The Environmental Protection Agency (EPA) initiated a campaign against backyard burning of household waste. EPA cites backyard burning of household waste as the nation's largest quantified source of dioxins, in addition to other dangerous pollutants, such as lead, mercury, particulate matter, and hexachlorobenzene. All of these compounds are toxic to the environment, can be a nuisance to nearby homeowners, and may even pose a threat to public health.

Act 97, The Pennsylvania Solid Waste Management Act, 35 P.S. 6018.610 provides that it shall be unlawful for any person or municipality to: "Burn solid wastes without a permit from the Department" and, DEP advises that the Department does not issue any permits to open-burn solid waste. There are, however, certain exemptions which include the burning of domestic (residential) refuse, if the fire is on the premises of a structure occupied solely as a dwelling by two families or less, and when the refuse results from the normal occupancy of the structure. The burning of domestic refuse is also governed by the County's Fire Prevention Ordinance (Ordinance No. 6 of 1993). In addition, the Adams County Conservation District, as part of the conditions of issuing Erosion and Sedimentation permits, prohibits the burning, burying, dumping, or discharging of building materials, wastes, or unused building materials at construction sites.

According to DEP, refuse from normal occupancy does not include such items as demolition waste, home insulation, shingles, treated wood, paint, painted or stained objects or furniture, tires, mattresses, box springs, metal, insulating rubber coating on copper wire, old television sets, old appliances, automobiles, and automobile components or items of this nature.

Very few municipalities in Adams County restrict backyard burning through the enactment of ordinances. However, the majority of the existing solid waste ordinances provide for the proper handling of municipal waste, restrict handling of waste in a manner that causes a nuisance, and do not specifically support backyard burning of municipal wastes. There has not been an assessment of the number of burn barrels in use throughout the County, but the most prevalent complaint received by the Office of Planning and Development regards open burning and the smoke and odor associated with incomplete combustion. As discussed in Section 1.4.1, it is assumed that a significant amount of residential waste, and some commercial waste, in the County is being burned (especially paper).

One of the few state regulations a person can utilize to combat open burning problems is the Pennsylvania Odor Regulation – this is a regulation that prohibits “malodors” (an odor which causes annoyance or discomfort to the public and which the Department determines to be objectionable to the public) from any type of activity other than agriculture.

Adams County will work with its Department of Emergency Services to update its Burn Ordinance, in consideration of safety concerns and a reduction in the number of volunteers available to respond to fires. The burning of debris has been cited as the major cause of wildfires in Pennsylvania.

2.2.3 Consideration of Expanding Existing Facilities

Chapter 5, Section 502 of the Municipal Waste Planning, Recycling and Waste Reduction Act (Act 101) mandates that the County Plan must consider the potential expansion of facilities that meet the definition of "existing facility" located within the County. Adams County does not own or operate any existing waste disposal and/or transfer facilities, and there is only one existing private facility (transfer station) in the County.

Due to the need for additional disposal capacity, and as required by PADEP and Act 101, a Request for Proposals (RFP) for securing long-term solid waste disposal capacity for Adams County was distributed as part of this Plan Update. Adams County has successfully executed disposal contracts with the designated disposal facilities identified in this Plan. These contracts satisfy the disposal capacity requirement as specified by Act 101. The RFP is described in detail in Chapter 3, Section 3.1.2.

The selection procedure for disposal facilities is outlined in Chapter 5 of this Plan. In order to allow for flexibility and backup capacity, Adams County decided to utilize multiple disposal facilities in a menu type Plan. This action is also expected to help maintain competition in the area.

It is intended by Adams County that this Plan does not interfere with any existing facility's effort to find other customers or to expand their facilities.

2.3 CONSTRUCTION AND DEMOLITION WASTE COLLECTION AND DISPOSAL

The predominant collection method for C&D waste is hauling by private waste hauling contractors. According to PADEP Waste Destination Reports, Adams County disposed of almost 9,140 tons of C&D waste in 2017. An undeterminable amount of C&D waste is recycled, reused, used as fill, burned, or

illegally disposed of at dumpsites. The County's C&D waste, which is reported as disposed, is transported to Mountain View Reclamation Landfill, Blue Ridge Landfill, Modern Landfill, the York County Resource Recovery Center, and Cumberland County Landfill.

2.4 SEWAGE SLUDGE DISPOSAL

Table 1-8 summarizes the sludge disposal practices of the municipal wastewater treatment facilities (WWTP) in the County. Information was collected through WWTP surveys distributed to municipal facilities in 2011, 2015, and 2018.

The large majority of facilities rely on land application or transport to out-of-County facilities for the disposal of their sludge.

Landfilling is used for sewage sludge disposal by a few facilities that dewater their sludge.

The final disposal sites for sludge are located both within and outside of Adams County. It is expected that facilities using land application will continue to use this method, unless proposed regulatory requirements related to phosphorus and nitrogen loading, or competition from out-of-county sources (or any other reasons), prevent land application from being a feasible disposal option. The potential development and impact of phosphorus standards for land application is discussed further in Chapter 5.

2.5 INFECTIOUS AND CHEMOTHERAPEUTIC WASTE COLLECTION AND DISPOSAL

Adams County does not manage infectious/chemotherapeutic waste as this type of waste is handled by the Pennsylvania Department of Environmental Protection under separate rules and regulations.

2.6 HOUSEHOLD HAZARDOUS WASTE

PADEP studies indicate that less than one (1) percent of the municipal solid waste generated is household hazardous waste (HHW). As described by PADEP, HHW are those wastes produced in our households (which also include multiple residences, hotels, motels, campgrounds, picnic grounds, and day-use recreation areas) that are hazardous in nature, but are not regulated as hazardous waste under Federal and State laws. HHW per capita generation for Pennsylvanians is approximately four pounds per year (a total of about 212 tons in 2017 for Adams County residents.) Included are such items as old paints and paint related products, pesticides, pool chemicals, drain cleaners, degreasers, batteries, computers, electronic equipment, car care products, and other related products. Such consumer waste products, if carelessly managed, can create environmental and public health hazards.

The Adams County Office of Planning and Development offers information on disposal options for materials such as: batteries, used oil, antifreeze, appliances containing Freon, computers, prescription medications, pesticides, and paint in its Recycling and Waste Management Information Brochure. The majority of HHW inquiries received by the Office are concerning disposal of paint. The preferred disposal option that is offered to callers is incineration at the York County Resource Recovery Center. Adams County has an agreement with York County to accept materials for disposal on a spot-market basis.

Frequently residents will take these materials to Neiderer Sanitation Transfer Station or the Hanover Transfer Station for shipment to the York County facility.

At this time, Adams County does not hold collection events for HHW. Only McSherrystown Borough residents are included in the HHW programs sponsored by the York County Solid Waste Authority (YCSWA), as part of their individual contract agreement with YCSWA.

As discussed in Section 1.8, there are a number of available options for residents in regard to the disposal of covered device equipment.

2.7 USED OIL / AUTOMOTIVE BATTERIES/ ANTIFREEZE

Used oil and intact automotive batteries from households are not considered to be hazardous wastes in Pennsylvania. However, these materials are generated in most households and are thus often grouped in the household hazardous waste category, and included in HHW collection programs.

Adams County maintains a current list of facilities that will accept used motor oil, anti-freeze, waste oil, and other automotive products (See the Adams County Recycling and Waste Management Information Brochure.) This list is provided to PADEP and all County municipalities.

Automotive dealers and battery retailers in the County, and throughout the State, are required to take old batteries when new ones are purchased (lead-acid batteries may not be discarded in landfills). Information on sites accepting lead-acid (car) batteries is also contained in the Adams County Recycling and Waste Management Information Brochure.

2.8 RESIDUAL WASTE

According to 2017 PADEP County Waste Destination Report Disposal Tonnages, 10,650 tons of residual waste generated in Adams County was disposed at the following six facilities (tonnages in parenthesis):

- Blue Ridge Landfill (2,309 tons)
- Clinton County SWA (0.1 ton)
- Cumberland County Landfill (496 tons)
- Modern Landfill (2,503 tons)
- Mountain View Reclamation Landfill (4,268 tons)
- York County Resource Recovery Center (1,074 tons)

PADEP requires that solid waste disposal facilities obtain the necessary permit approvals for each generator. Disposal agreements are individually arranged between the facility and generator. Adams County does not manage residual waste disposal.

CHAPTER 3 | DISPOSAL CAPACITY NEEDS

3.1 MUNICIPAL SOLID WASTE DISPOSAL NEEDS

The purpose of Chapter 3 is to consider possible waste management system changes through the planning period to January 1, 2029, and to estimate municipal waste disposal capacity needs for Adams County over this same period, as mandated by PADEP.

According to PADEP County Waste Destination tonnage records, Adams County disposed of 53,540 tons of MSW (see Table 1-5) in 2017. Municipal recycling records and the annual Act 101 Recycling Report documented that Countywide recycling programs diverted an estimated 45,861 tons of recyclable materials in 2017. This would indicate an almost 51 percent rate of waste reduction being achieved ($45,861/90,209$ tons per capita waste generation ($106,128$ population $\times 0.85$ per capita waste generation) $\times 100\%$). In the future, Adams County waste generation quantities will continue to change to reflect County growth. Changes in recycling activities will be reflected as the percentage of waste diversion. One variable that could affect current and future recycling activities in Adams County, and the percentage of waste diversion achieved, are ongoing problems with recycling of various commodities as markets adjust to material bans in China and other countries. It is also important to note, that glass recycling has been eliminated from many local programs for lack of a sustainable market and low commodity pricing. It is assumed that the County's diversion rate will hold fairly steady through the next planning period.

The method and assumptions used to determine these capacity requirements are described in detail in Chapter 1 - Description of Waste.

Act 101 set a goal of 35 percent recycling and Adams County is achieving this goal.

The primary variables affecting waste generation estimates and projections include, but are not limited to, population, economic development and employment growth, per capita income, waste minimization, source separation and recycling efforts, recycling materials markets and consumer purchasing trends.

Table 1-6 indicates the estimated required annual disposal capacity from 2019 through 2028. Population (and thus gross waste generation) will increase steadily over the planning period through January 1, 2029.

3.1.1 Available Landfill Disposal Capacity vs. Disposal Need

There are no landfills and only one transfer station in Adams County. Therefore, there is a need to reserve disposal capacity from other processing and disposal facilities to ensure sufficient municipal waste disposal and processing capacity for the County and its municipalities (for the planning period through January 1, 2029).

Adams County will require an average of approximately 96,000 tons per year of disposal capacity (or approximately 957,559 tons for the planning period from 2019 through 2028) to meet estimated municipal waste disposal capacity needs over the required 10-year planning period. The Request for Proposals (RFP) released on October 31, 2018 resulted in executed agreements with the disposal facilities listed in Chapter 6 of this Plan. In addition, Adams County has a long-term disposal agreement with the York County Resource Recovery Center to accept municipal solid waste from municipalities without

agreements on a spot-market basis, to the extent of available capacity at the York facility. The Center received a reported 12,141 tons of municipal waste in 2017.

3.1.2 Request for Proposals (RFP) for Disposal Capacity

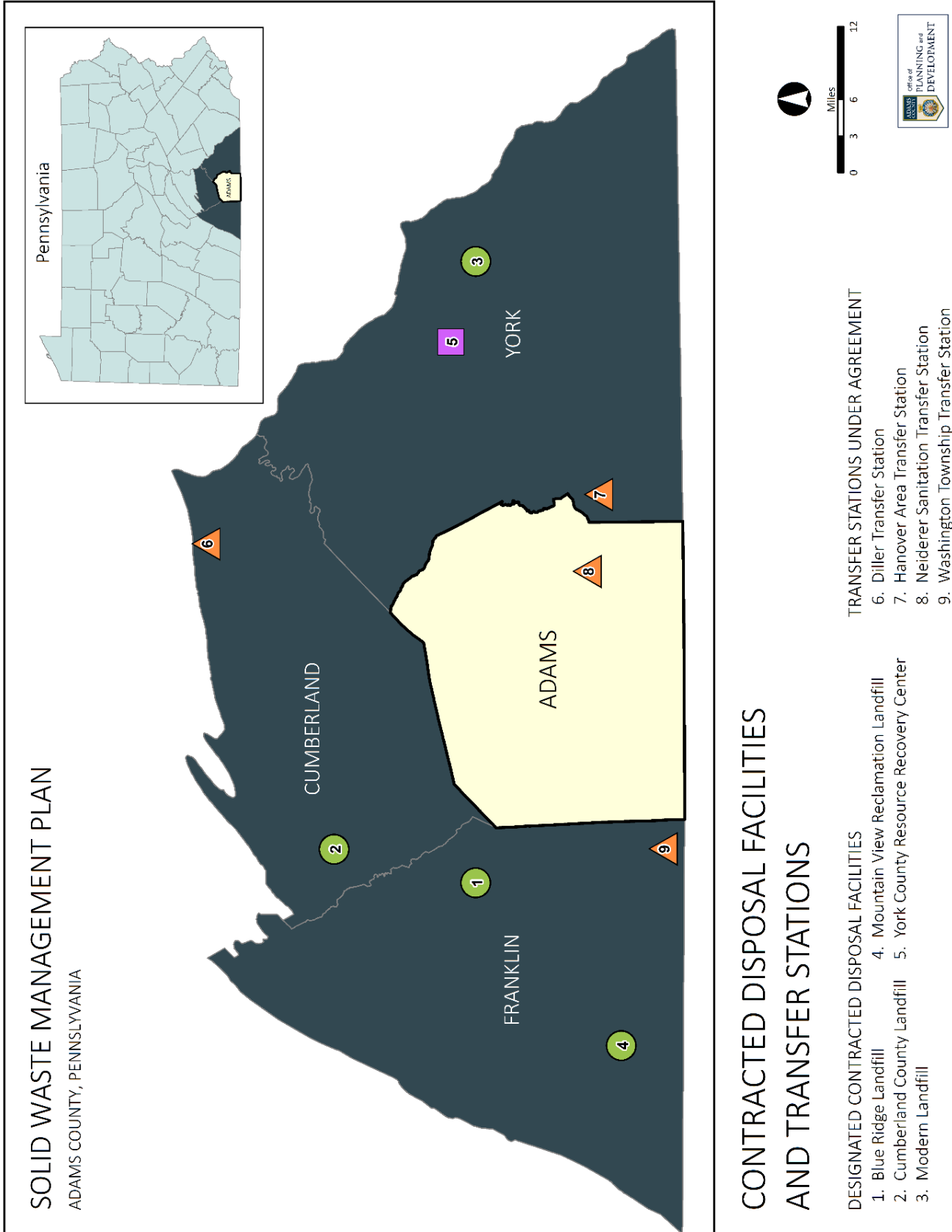
The County issued a Request for Proposals (RFP) on October 31, 2018 for qualified municipal waste disposal facilities to provide disposal capacity for Adams County's municipal solid waste, beginning January 1, 2019 (See Section 5.4.2, Background.). The prior disposal contract period ended on December 31, 2018. Four responses/proposals were received from various disposal facilities. These proposals were evaluated based on criteria outlined in the RFP. All four proposal responses were determined to meet the minimum required qualifying criteria. Adams County executed Municipal Waste Disposal Capacity Agreements with the qualified RFP respondents.

The York County Resource Recovery Center is also included in the Plan as a designated facility, along with the other qualified RFP respondents.

Additional facilities may be added to the Plan, provided they complete the Application Package available from the Adams County Office of Planning and Development, and meet minimum qualifying criteria. Section 5.7.5.3 describes the procedure to add facilities to the Plan.

The locations of the facilities that are included in the Plan as designated disposal and processing facilities are shown in Figure 3-1. Additional information pertaining to the RFP and waste disposal system selection process is contained in Chapters 5 and 6 of this Plan.

FIGURE 3-1: CONTRACTED DISPOSAL FACILITIES AND TRANSFER STATIONS



3.2 SEWAGE SLUDGE CONSIDERATIONS

Tables 1-8 and 1-10 presented information on the wet and dry tonnages of sewage sludge that are generated by the 21 municipal and the approximately 25 non-municipal wastewater treatment plants (WWTPs) operating in Adams County.

Using data reported in the 2011, 2015, and 2018 surveys, an average of 7500 wet tons of sludge is landfilled annually. This is a small percentage of the sewage sludge generated within the County. A much larger amount of sewage sludge (municipal and non-municipal) is land applied in-County or out-of-County, ranging from 2 to 5 million gallons annually.

The Phase III Chesapeake Bay Watershed Implementation Plan may have an impact on land application of sewage sludge if regulations become more stringent in regard to nutrient reductions to the Bay.

Septage that is pumped from Adams County's on-lot disposal septic tanks is in liquid form, and is generally taken to out-of-County wastewater treatment plants for processing and disposal.

Table 1-11, provides projections of WWTP sewage sludge and on-lot septic tank septage generated in Adams County. Non-municipal pumpings were estimated to range from approximately 2 to 5 million gallons as reported in the 2011, 2015 and 2018 surveys. Current practices of land application and/or WWTP treatment of liquid sewage sludge are expected to continue throughout the planning period of this Plan. Issues and concerns over the future of the land application program, and whether this disposal method is at risk of being lost as a disposal option, is discussed in Chapter 5 of this Plan.

A reported 543 tons of sewage sludge from WWTPs in the County were landfilled in 2017. This amount has decreased since the previous planning period. Mountain View Reclamation Landfill disposed of 82 tons of sewage sludge received from various plants in the County and Modern Landfill disposed of 461 tons.

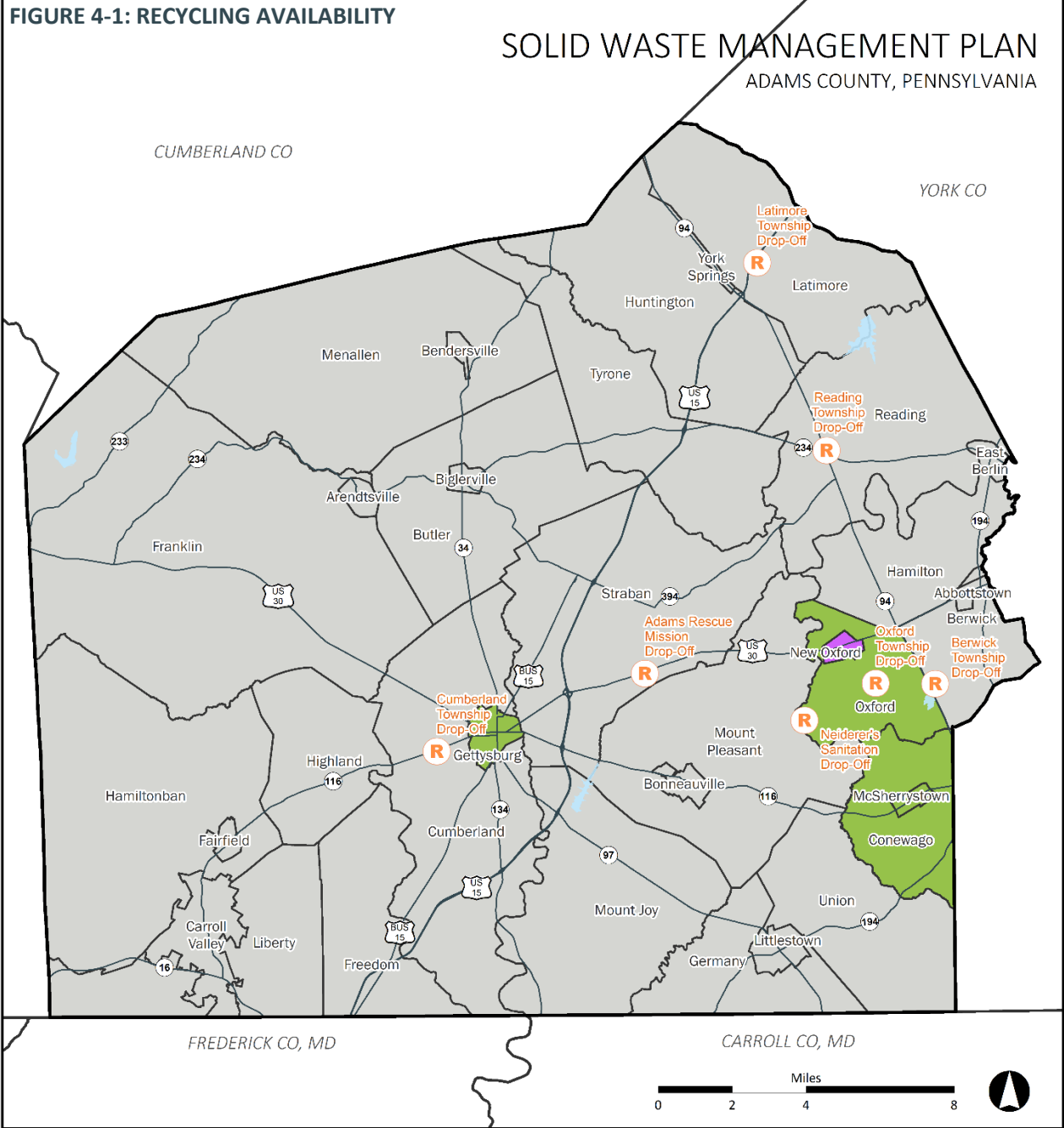
Chapter 5 of this Plan examines available options for future disposal of dewatered cake from Adams County's WWTPs.

CHAPTER 4 | RECYCLING STRATEGY

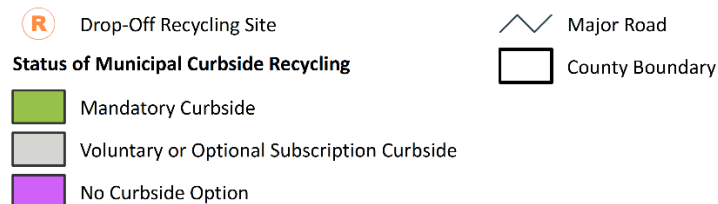
4.1 INTRODUCTION

Gettysburg Borough, Conewago Township, and Oxford Township are the three municipalities mandated to recycle by Act 101 requirements (population total and population density) within Adams County. McSherrystown Borough has also opted to require residents to recycle (to reduce the amount of waste going to the York County Resource Recovery Center). Table 1-2 lists the township and boroughs, and their corresponding 2010 populations (most recent decennial census), as well as projected populations through the next planning period.

There are seven (7) drop-off sites in operation within the County. Five (5) of these drop-off sites are administered by the Adams Rescue Mission (ARM), a non-profit entity offering recycling services to residents and businesses in Adams County. ARM has made, and will continue to make, operational changes to its recycling services as market fluctuations occur. The locations are: Berwick Township, Cumberland Township, Latimore Township, Reading Township, and at the Adams Rescue Mission in Straban Township. Two of these drop-off sites, at Oxford Township and at the Neiderer Sanitation Transfer Station, are maintained by Neiderer Sanitation. The locations of drop-off sites and municipalities with available curbside recycling programs are presented on the map in Figure 4-1. New Oxford Borough is the only municipality where curbside or drop-off recycling is not available. There are, however, many individuals, businesses and industries in New Oxford that do participate in recycling efforts. The Adams County Office of Planning and Development updates and distributes, a recycling and waste management brochure throughout the year. The brochure provides recycling and waste management information to residents including the addresses, phone numbers, and accepted types of recyclable materials for the various recycling outlets located in, and outside of, the County.



CURBSIDE RECYCLING AVAILABILITY AND DROP-OFF RECYCLING SITES



4.2 RECYCLABLE MATERIALS IN THE COUNTY WASTE STREAM

A recycling program may target just a few materials, or a large number of materials. The decision of which materials to include in a particular program rests on considerations of expected waste stream impact, cost, convenience to participants and, in these unsettled times, reliable markets. As with other recycling planning alternatives, the choice will depend largely on expected waste reduction and expected cost, in many cases with a trade-off between the two objectives.

This section describes materials targeted by the Adams County municipal recycling programs. Table 1-7 presents a comparison of the actual percentage (by weight) of materials recycled in Adams County in 2017 to materials recycled (by weight) in EPA's *Advancing Sustainable Materials Management: 2015 Fact Sheet*.

All municipalities that have curbside recycling services available to residents are serviced by private hauling companies offering services for a fee (See Waste Services Information). Twenty-two of these municipalities have recycling services available under jointly bid collection contracts with private haulers. Two of these joint-bid municipalities (the Act 101-mandated municipalities) require mandatory curbside recycling under their contracts. Additionally, McSherrystown Borough also requires mandatory recycling under their individual contract.

The various recyclable materials that are managed in Adams County are presented below. The public and private entities within the County that accept each type of material are also listed within each subsection.

Newspaper

Newspaper, which is primarily generated in the residential sector, comprises a much smaller percentage of the municipal waste stream as more people turn to electronic means of receiving news. Recycled newspaper is frequently turned back into newsprint. Sometimes newspaper is reused for animal bedding or mulch, or recycled into low-grade computer printout paper and cardboard.

Newspapers are collected in all Adams County municipal curbside recycling programs. The Adams Rescue Mission and Neiderer Sanitation also collect newsprint at drop-off locations.

Corrugated Paper

Corrugated paper, referred to in the recycling industry as "old corrugated containers or OCC" may comprise a significant portion of the municipal waste stream. The majority of it is generated by the commercial sector (or local businesses.)

It is important to note that on-line shopping is also generating more corrugated shipping materials from the residential sector. These materials can generally be recycled through the various curbside recycling programs.

A majority of OCC recycling in Adams County is conducted by the Adams Rescue Mission. Neiderer Sanitation also accepts OCC at its drop-off locations. Waste Management, Waste Connections, Chambersburg Waste Paper, Park's Garbage Service, Advanced Disposal, and York Waste Disposal also maintain contracts for collection of OCC from various businesses. In addition, there are some businesses that market their own materials, or backhaul to central locations for recycling.

Office Paper

Office paper and high-grade paper include fine papers, computer printout, office papers, and ledger paper. Office paper is typically three to seven percent of a municipality's total waste stream, and

generates relatively high revenue per volume. Adams County has a relatively small number of industries or institutions that produce large quantities of office paper. Based on the 2003 R. W. Beck Statewide Composition Study, disposal of office paper in rural areas is half that disposed of by suburban and urban areas. It is assumed that much of the paper generated by Adams County's rural households is disposed of through backyard burning.

The Adams Rescue Mission and Chambersburg Waste Paper Company offer segregated office paper collection services. Neiderer Sanitation also accepts office paper at its drop-off locations. All of the major waste collection companies operating in Adams County collect office paper as part of their curbside single stream recycling services. There are a number of secure shred companies offering services within the County.

Mixed Paper

Mixed paper refers to a mix of any of the above three types of waste paper plus other waste papers such as junk mail, phone books, magazines, and cereal boxes. By the nature of the material, mixed paper includes a small amount of contamination, including glue and plastic. Roofing material and boxboard manufacturing are traditional uses of mixed paper, and for the production of low-grade tissue and toweling products.

Mixed paper is collected in Adams County municipal curbside recycling programs. Chambersburg Waste Paper Company is a private hauling company that provides mixed paper collection service to several businesses and institutions. The Adams Rescue Mission and Neiderer Sanitation also accept mixed paper for recycling. In addition, the U.S. Postal Service offers drop-off sites for unwanted mail at a few postal locations in the County. They back-haul this material to their regional location. It is assumed that much of the mixed paper generated in Adams County is disposed of through burning.

Glass

Three colors, or forms, of glass are found in the municipal solid waste stream (e.g. clear, green and amber). Container glass (i.e., bottles and jars) is usually the most marketable, and most commonly, recycled form of glass. Collected waste container glass can be melted and mixed with virgin glass ingredients to make new container glass. Some of the cullet (broken container glass) is used to manufacture asphalt products, bricks, and other building products. The majority of glass is generated in the commercial sector at wineries, cideries, restaurants, and social clubs. The percentage of glass in the municipal solid waste stream has decreased, due to the trend of manufacturers to replace glass containers with plastic containers.

Based on the 2003 R.W. Beck Statewide Composition Study, glass (clear, green, amber, and nonrecyclable) makes up about 3.7 percent of Adams County's waste stream. The Adams Rescue Mission no longer recycles glass because of low commodity pricing and market accessibility. A few curbside recycling programs have also discontinued accepting glass. The mandated communities of Gettysburg, Conewago, and Oxford continue to recycle glass containers.

Steel and Bi-metal Cans

There are two types of steel cans: tin-coated steel cans commonly known as tin food cans and "bi-metal" beverage cans. Bi-metal cans have a coated steel body and aluminum ends. These cans are collected together. The steel scrap yielded from these containers can be combined with "cleaner", in-plant scrap and virgin material, in the steel manufacturing process.

As with other recyclable materials, processing costs, and the costs of haul-to-market, erode the value of tin and bi-metal cans to recyclers.

All County curbside recycling programs, recycling drop-off sites, and all scrap recycling operations in the County accept steel and bi-metallic cans (See the Adams County Recycling and Waste Management Information Brochure).

Aluminum Cans

Aluminum cans, or used beverage cans, are among the most readily recoverable aluminum products. Aluminum cans comprise about 0.8 percent of the waste stream based on the R.W. Beck Statewide Composition Study completed in 2003. Aluminum cans are very readily reprocessed into new aluminum sheet. In the past, cost savings from using scrap-aluminum, rather than virgin inputs, provided for a strong scrap-aluminum market. Aluminum markets are less stable than in past years; however, in a fragile recycling market, aluminum remains a relatively stable and marketable recyclable commodity. Many individuals, and some service organizations collect aluminum cans as a fund-raising activity.

Aluminum cans are collected in all municipal curbside recycling programs, and at all drop-off locations in Adams County. Private recyclers including local scrap recycling operations accept aluminum cans.

Plastics

The two most common recyclable plastics are PET (polyethylene terephthalate - #1) and HDPE (high-density polyethylene - #2). PET is most commonly used to produce soft drink bottles. HDPE is most commonly used to produce milk and water containers, colored and opaque detergent bottles. These types of plastics can be processed and substituted for virgin materials in a variety of products. One example is plastic lumber, a product suitable for making park benches and boat docks. Markets are available, and fairly stable, for clean PET and HDPE.

All private haulers collect plastic bottles labeled #1 and #2 in curbside programs. A number of these haulers may also accept plastics #3 through #7. The Adams Rescue Mission accepts #1 and #2 plastic bottles at all of its drop-off locations. Neiderer Sanitation accepts #1, #2 and #5 plastic containers.

The Pennsylvania Department of Agriculture continues to accept only high-density polyethylene (HDPE) plastic pesticide containers in its Plastic Pesticide Container Recycling (PPCR) Program. Adams County participates in this Program, and there are various drop-off locations available throughout the County.

Other Recyclable Materials

Provided markets can be found, various other types of materials in the municipal waste stream can also be recycled. White goods, tires, used motor oil, automotive batteries, computers, Ni-Cad batteries, cell phones, and textiles (clothing) are examples of items that may be recycled, in addition to the recyclables designated under Act 101 Guidelines presented in the beginning of this Chapter (See the Adams County Recycling and Waste Management Information Brochure). The examples mentioned potentially pose disposal problems in both landfills and incinerators, and may end up at illegal dumpsites.

White Goods

Large appliances or "white goods" can be shredded, and the steel separated for recycling. Prior to recycling, the Freon must be removed from all freon-containing appliances (i.e., refrigerators and freezers, etc.) by a certified individual.

All twenty-two jointly bid municipal waste collection contracts include a large-item pick-up service for

customers as part of the contract. Freon-containing appliances are part of their weekly large-item disposal service. Although Adams County requests information on the amounts of large-item materials that may be recycled; this information is generally not provided by the haulers, with the exception of Neiderer Sanitation and Stonesifer Sanitation. All identified locations accepting white goods in the County only accept non-freon-containing appliances, or appliances that are certified freon-free. Several private businesses in Adams County offer Freon removal/recycling services for a fee (See Adams County Recycling and Waste Management Information Brochure).

Tires

Used tires can be re-treaded, shredded, and processed into crumb rubber for use in rubber plastic products. Tires can be recycled to produce a durable ingredient in the production of asphalt. Alternatively, tires can be shredded and burned as a source of fuel.

Tires are accepted at the Washington Township Transfer Station located in Franklin County, Neiderer Sanitation in Adams County, and at the York County Resource Recovery Center located in York County, for a fee. In addition, several local tire distributors accept used tires for a fee. The jointly bid contract for twenty-two municipalities allows for one tire per pick-up as part of their weekly large item disposal service. McSherrystown Borough's contract with the York County Resource Recovery Center allows its residents to dispose of one tire per week with their curbside collection service.

Adams County, with financial assistance from the Department of Environmental Protection and in partnership with the Adams County Conservation District, has sponsored an almost annual tire recycling program since 2003 and has removed almost 24,000 tires, weighing over 300 tons. The County will continue to seek this type of assistance to sponsor future tire recycling programs.

Textiles

Used textiles can be recycled, and have become a big business. Textiles can be reused as recycled clothing, rags, or reprocessed into filler products such as insulation or furniture padding.

The Adams Rescue Mission recycles textiles through its recycling center drop-off location. Some of the textiles the Mission receives are selected for sale through its re-use store. Several thrift shops in the County offer used textiles for sale. There are also numerous donation boxes placed throughout the County, at businesses and churches, soliciting used clothes for recycling by various organizations.

Used Motor Oil

Used motor oil and many industrial lubricants can be refined to produce heating fuel.

Several area businesses accept used motor oil and lubricants as a source of heating fuel for their facilities, while other businesses offer used oil recycling to their customers as a free service, or for a nominal fee. Some local businesses in the County purchase on-specification waste oil fuel for their boiler systems. Additional information for disposal of used motor oil is provided in Chapter 2, Section 2.7.

Batteries

State Regulations prohibit the disposal of automotive batteries in municipal waste landfills. The metal in automotive batteries and the polypropylene plastic can be recycled. There are several facilities that accept used automotive batteries in, or within a reasonable distance of, Adams County (See the Adams County Recycling and Waste Management Information Brochure). Additional information on battery disposal is provided in Chapter 2, Section 2.7.

Reuse

Throughout the year, many reusable or unwanted items find a new home in Adams County through a resource network maintained by the United Way of Adams County (UWAC). UWAC works with Gettysburg College at the end of each school year to recycle tons of unwanted and leftover student and college items back into the community (Give It Up For Good Sale). In sixteen years they have diverted more than 400 tons. Also, a growing number of thrift shops, recycling websites (like Gettysburg Freecycle) and reuse stores (like Adams County Surplus) provide a means of making good, usable items available to the community. In addition, Historic Gettysburg-Adams County, a local non-profit, maintains an architectural warehouse to salvage vintage building materials.

4.3 POTENTIAL BENEFITS OF RECYCLING

Act 101 requires that each County Municipal Solid Waste Management Plan describe and evaluate the potential benefits of recycling. The cost benefits of recycling stem from two sources: the revenue returns generated from recyclable materials markets, and a reduction of municipal costs from lower quantities of waste requiring collection, transportation, processing, and disposal. The reuse value of the material is reflected in its market price and is subject to frequent changes. China has banned most recyclable materials from the United States, which is affecting the marketing of materials. The average recyclables net market value for many types of recyclables (after transportation and processing) is close to zero, or recyclers and governmental organizations are paying to have materials recycled, if they are able to find a suitable market. The downturn in the recycling marketplace has even caused some organizations to dispose of recyclables, rather than incur additional costs. Some of the chief benefits of recycling, such as the avoided cost of disposal and environmental considerations, are therefore being reevaluated. There are, however, efforts underway in the United States for investment in domestic markets, which may increase demand for recyclable materials in the future.

4.4 EXISTING RECYCLING ACTIVITIES

Gettysburg Borough, Conewago Township, and Oxford Township are the only municipalities in Adams County required by Act 101 to implement a mandatory recycling and yard waste collection program. Although McSherrystown Borough is not a mandated community, it does require recycling by its residents. The remaining 30 municipalities in the County, due to low total populations or low population densities, are not required to establish recycling programs under Act 101. **All municipalities in Adams County have access to curbside recycling services for a fee, with the exception of New Oxford Borough.** However, there are many individuals, businesses and industries in New Oxford that do participate in recycling efforts. Refer to Section 2.1 of Chapter 2 for a summary of the waste collection activities in the County, inclusive of recycling and yard waste collection.

Twenty-two municipalities in Adams County participate in a jointly bid contract with private haulers for waste collection and recycling services. Two of these municipalities mandate services for their residents, while the majority of municipalities allow residents to participate voluntarily.

The Adams Rescue Mission also provides recycling collection services within the County at various businesses and institutions. In addition, the Mission collects at five (5) recyclable drop-off locations in the County. Neiderer Sanitation maintains two recycling drop-off locations within Adams County.

Based on information reported to the Adams County Office of Planning and Development in 2017 for the Act 101 Annual Recycling Report, Adams County recycled 45,861 tons of materials, or diverted 51% of the

total County waste stream in 2017. This rate is expected to remain fairly stable in the future, with some increase from better reporting methods and increased participation.

4.4.1 Gettysburg Borough Recycling Program

As one of only three municipalities mandated to recycle in Adams County, The Borough of Gettysburg's recycling program is an important part of the overall recycling effort within the County. The Borough uses a single-stream curbside collection program for recyclables.

Gettysburg Borough residents can recycle the following materials for curbside collection under its waste collection contract with a private hauler:

- steel and bi-metallic cans (food and beverage cans)
- aluminum (food and beverage cans)
- newspaper, mixed paper and corrugated cardboard
- plastics (numbers 1-7)
- clear, brown, and green glass (food and beverage containers)

Leaf waste, brush, and Christmas trees are picked up separately by the Borough and the contracted hauler, and recycled. Gettysburg Borough residents may also participate in quarterly covered device recycling events as part of their contracted services. The Borough also requires business establishments to recycle.

4.4.2 Conewago Township Recycling Program

Similar to Gettysburg, the Township is a mandated community utilizing a single-stream curbside collection program for recyclable materials. The recycling program is a component of the Township's waste collection contract with a private hauler.

Conewago residents can recycle the following materials for curbside collection under its waste collection contract with a private hauler:

- steel and bi-metallic cans (food and beverage cans)
- aluminum (food and beverage cans)
- newspaper, mixed paper, and corrugated cardboard
- plastic (numbers 1-7)
- clear, brown, and green glass (food and beverage containers)
- gable-top cartons
- Christmas trees and yard waste are also included under the collection contract

In addition, Township residents may participate in quarterly covered device recycling events as part of their contracted service. The Township also requires business establishments to recycle.

4.4.3 Oxford Township Recycling Program

Oxford is a newly-mandated community utilizing a combination of single-stream curbside collection and drop-off recycling services.

Oxford Township residents can recycle the following materials through a private hauler:

- steel and bi-metallic cans (food and beverage cans)
- aluminum (food and beverage cans)
- newspaper, mixed paper, and corrugated cardboard
- plastic (numbers 1, 2, and 5)
- clear, brown, and green glass (food and beverage containers)

Brush is accepted in the curbside service. In addition, the Township requires business establishments to recycle.

4.5 COMPATIBILITY WITH OTHER PROCESSING AND DISPOSAL METHODS

Act 101 requires each County Municipal Solid Waste Management Plan to "describe and evaluate the compatibility of recycling with other municipal waste processing or disposal methods, giving consideration to and describing anticipated and available markets for materials collected through municipal recycling programs". This section briefly presents issues of compatibility with landfilling, waste-to-energy, municipal waste composting, and centralized materials recovery.

4.5.1 Compatibility with Landfilling

Technically, recycling of waste materials is compatible with landfilling operations. Removal of organic and other decomposable materials, such as paper, leaf and yard waste, reduces the environmental impact of landfilling, while also preserving landfill space. Removing inert material, such as plastics, preserves landfill space and saves on operating costs. In addition, landfill operators are required to provide a recycling drop-off station at their facility.

4.5.2 Compatibility with Waste-to-Energy

Removal of non-combustible material such as glass and metals improves combustion efficiency, reduces wear on the equipment and combustion unit, and reduces the amount of ash produced. A number of waste characterization studies have concluded that comprehensive recycling programs do not lead to a decrease in the BTU content of municipal solid waste. Any reduction in the waste stream saves incineration costs by decreasing the required throughput capacity of a new facility.

The York County Resource Recovery Center received and processed over 12,141 tons of Adams County municipal waste in 2017, based on PADEP waste destination reports.

4.5.3 Compatibility with Centralized Materials Recovery

Centralized materials recovery involves the separation, at a centralized facility, of recyclable (and compostable) materials from mixed municipal solid waste. For municipal solid waste composting systems, materials recovery is often a preprocessing step conducted prior to composting. Source separation recycling benefits the process by removing non-compostable materials, such as glass and metals, which will need to be removed from the compost feedstock anyway.

4.5.4 Compatibility with Municipal Waste Composting

A cleaner compost feedstock will produce a cleaner and better final compost product. Recycling is compatible with composting; removing inerts from the wastestream. Since paper can be composted as well as recycled, only the high-value recyclable paper fractions are normally removed from the wastestream prior to composting.

Municipal Waste Composting is a technology well-suited to processing the highly degradable organic portion of the County's wastestream. In fact composting, together with recycling, usually creates a 60-80% reduction in the tonnage of waste to be disposed of. For this reason, composting as a form of volume and tonnage reduction is compatible with recycling that is done for waste reduction. It also provides a long-term solution to the disposal of municipal waste water treatment plant sludge, generated by many public treatment plants, as well as septic tank pumpings now disposed of by private septic haulers. In addition, many industrial residual waste materials (food processing wastes) and agricultural waste products are suited to processing through municipal waste composting.

4.6 PROGRAM ALTERNATIVES: COLLECTION METHODS

This section presents the collection system options for residential curbside collection programs, for drop-off programs, and for commercial and institutional recycling programs.

4.6.1 Curbside Collection Alternatives

One alternative for municipalities that are not mandated (non-mandated) to recycle is to consider implementing a voluntary recycling program. Many municipalities in Adams County participate in optional subscription curbside recycling programs. For mandated or voluntary recycling programs, there are many choices facing a municipality when planning a residential curbside collection program. Some of these choices include: commingled or single-stream (mixed) collection versus segregated collection, size and type of storage/collection containers for residents, pick-up frequency (including what days to offer collection), contracted services vs. participating in services provided free of charge, provisions to include multi-family dwellings, and determining the specific details on how the collection service will be provided. These considerations are examined below.

4.6.1.1 Commingled, Source-Separated, or Single-Stream Curbside Recycling

There are a variety of ways that material can be set out by residents, and collected by the recycling service provider. Residents can place all materials in a single bin or bag (commingled). Collection workers can then either empty the bin or bag into a single compartment of a truck (commingled pickup), the contents in a single bin on the collection vehicle, or sort the materials at the curb into separate compartments of the truck (curb-sort) bins. A common variant of commingled collection is to place glass, plastics, and aluminum and metal food and beverage containers in one curbside bin. If included in curbside collection, paper products like newspaper (and perhaps also corrugated cardboard) are separated into another bin.

Totally segregated “set-out” (set-out refers to residential recycling method where materials are placed at the curb by residents) requires residents to sort or source-separate materials into three or more containers, depending on the number of materials accepted by the recycling program. A common variant of segregated set-out is to have residents set out glass in one container and cans (tin, bi-metal, and aluminum) in another. In this scenario, collection crews might empty the cans in one truck bin, and color-sort the glass into three truck compartment bins at the curb. Segregated collection is receiving renewed interest, in light of contamination problems with commingled or single-stream recycling. The Adams Rescue Mission offers a segregated collection program for business and commercial entities in Adams County.

Commingled set-out is another recycling method frequently chosen for curbside recycling programs. This method is considered to be more convenient for residents (which may increase participation). Relative to segregated collection, commingled collection saves collection labor expenses and allows fuller truck utilization by reducing collection time. Commingled collection can also be more flexible than segregated collection: the materials can be easily removed from, or added to, the program without affecting the number of containers and truck bins needed. A common variant of commingled collection is to place glass, plastics, and aluminum and metal food and beverage containers in one curbside bin. If included in curbside collection, paper products like newspaper (and perhaps also corrugated cardboard) are separated into another bin. Another more modern variant of this is to place all recyclable materials, including paper, in one bin for collection in a single compartment truck and sorting/processing at a central site. This is called single-stream recycling. Single-stream recycling is the most common form of curbside recycling by private haulers in Adams County.

Typically, the municipality selects the type of set-out that is required of residents, and the private contractor collects, hauls, and markets the materials. Regardless of whether commingled, source-segregated, or single-stream set-out is chosen, it is advantageous to distribute specially marked household containers. Supplying containers makes recycling more convenient. The container’s presence in the home reminds people to recycle, and their presence at the curb helps route drivers to quickly spot where to stop for pickups. It also serves as a recurring reminder to neighbors to recycle. Consistent weekly collection is easy for residents to remember, and is the least demanding of home storage space. Mandated municipalities in Adams County require weekly recycling services. In most other non-mandated municipalities, collection of recyclables is made bi-weekly.

4.6.1.2 Recycling Collection Contracting Options

A municipality may use its own vehicles and staff to collect recyclables, or it may contract with a private collector for the service. PADEP grants are available to reimburse up to 90 percent of the cost of collection equipment purchased by municipalities to do their own collections. In Adams County there are no municipal curbside collections.

4.6.2 Recycling Collection at Multi-Family Housing

Multi-family residential housing units (4 or more units) are required under Act 101 to recycle as part of a municipal mandatory recycling program. Multi-family housing units typically provide recycling as part of an independent commercial waste collection and recycling program. However, Act 101 requires that a mandated municipality must make recycling available for owners of multi-family housing in its recycling ordinance. The ordinance must define landlord compliance as establishing a collection system that includes "suitable containers for collecting and sorting materials, easily accessible locations for the

containers, and written instructions to occupants. As requested, the Adams County Office of Planning and Development provides assistance to municipalities and owners of multi-family units in developing recycling programs.

4.6.3 Drop-Off Centers

With only three municipalities, Gettysburg, Conewago, and Oxford, having mandatory curbside recycling collection, public and private drop-off centers are an important consideration in the County's recycling strategy. In recent years, all of the municipalities participating in the jointly bid waste collection contract have added a curbside recycling component to their contracts for the benefit of their residents. Residents can also recycle at a few drop-off locations within the County.

Five recyclables drop-off locations (including the drop-off at The Adams Rescue Mission Recycling Center) in the County are maintained by the Adams Rescue Mission. Below is a brief description of the Mission's drop-off recycling program that is operated in the County. Drop-off locations are depicted in Figure 4-1. Two other drop-off locations are maintained by Neiderer Sanitation Company.

In light of the recent recycling commodity upheaval, the Mission accepts only the following materials:

- steel and bi-metallic cans (food and beverage containers)
- aluminum (food and beverage containers)
- high-grade office paper
- newspaper/mixed paper
- corrugated cardboard
- plastic - natural HDPE and PET (numbers #1 and #2)
- textiles

Neiderer Sanitation accepts the following:

- steel and bi-metallic cans (food and beverage containers)
- aluminum (food and beverage containers)
- high-grade office paper/newspaper/mixed paper
- corrugated cardboard
- plastics (numbers #1 and #2)

4.6.4 Commercial and Institutional Recycling

Act 101 instructs mandated municipalities to require persons at commercial, institutional, municipal establishments, and at community activities (e.g., fairs, sporting events) to source- separate certain materials for recycling. At a minimum, mandated municipalities must require programs to include high-grade office paper, corrugated cardboard, aluminum cans, and leaf waste, if applicable.

The annual Apple Harvest Festival event, held each fall at the South Mountain Fairgrounds (not in a mandated community) has implemented a successful recycling program to reduce their disposal costs that primarily targets corrugated cardboard.

Mandated municipalities are required to provide a system that collects recyclable materials from the curbside, or a similar location. Gettysburg Borough, a mandated municipality, has placed recycling containers next to their on-street waste receptacles to encourage recycling by the millions of tourists that visit each year. The mandate applies to all residences, institutions, and commercial or municipal establishments within the municipalities. Mandated municipalities must adopt a recycling ordinance that may not be less stringent than the Act 101 mandate.

Municipalities must also allow establishments to meet their recycling requirements by providing for their own collection and marketing, as long as the establishments provide written documentation of the tons recycled. This documentation is required to be submitted to the County each year.

Gettysburg Borough, Conewago Township, and Oxford Township are the only mandated municipalities required to implement commercial and institutional recycling programs.

4.7 PROGRAM ALTERNATIVES: PROCESSING, STORAGE, & SALE

4.7.1 Background

Most recyclable materials are not immediately useful to manufacturers in the form in which they are collected. Collected materials must be processed to remove contaminants, be sorted by material type, and be baled or densified (if required) for shipping to market. Prior to passage of Act 101, scrap yards and recycling centers had been accepting recyclable materials from businesses and the public, and preparing it for sale to manufacturers. There are multiple scrap yards located in this region. In some cases the recovered material can bypass these intermediaries, going directly from the collectors to the end user.

Buyers typically prefer doing business with a supplier who can be relied on to provide a large flow of materials that is consistent in both quantity and quality. Such a function, beyond the capacity of most individual municipalities, is often fulfilled by private intermediate processors or by public, multi-municipal facilities.

In recent years there has been a growth in the size and number of recyclables processing facilities, commonly known as Materials Recovery Facilities (MRFs). Less frequently, these facilities are referred to as Intermediate Processing Centers (IPCs). Such facilities typically accept a variety of recovered materials from municipal recycling programs and commercial waste recovery efforts. After receipt of materials the MRF processes the material to sort and consolidate the material, upgrade its value, and ship to final markets when sufficient quantity has accumulated. Most recycling facilities have the capability to sort single-stream recyclables, inclusive of paper materials. The Adams Rescue Mission is the only MRF facility within the County, and receives source-separated materials. Many private collectors in this region utilize the Apple Valley Recycling Center in Hagerstown, Maryland, or the Penn Waste Recycling Center in York, Pennsylvania.

Apple Valley MRF sorting belt



4.8 YARD WASTE MANAGEMENT

4.8.1 Introduction

Chapter 272 of the Municipal Waste Management Regulations defines "leaf waste" as "leaves, garden residues, shrubbery and tree trimmings, and similar material, but not including grass clippings." Although not defined in Act 101 or the PA Municipal Solid Waste Regulations of 1988, an accurate description of "yard waste" would be leaf waste plus grass clippings. Yard waste comprises 10 to 20 percent, possibly more, of a typical municipal waste stream, making it an attractive target for diversion through a composting program.

Composting is a natural biological process in which organic matter decomposes into a useful humus material that is valuable as a soil amendment. While the nutrient content of yard waste compost is too low for it to be considered a fertilizer, it is a valuable soil conditioner and organic amendment, improving the physical, chemical, and biological properties of the soil.

In general, composting is not allowed without a PADEP municipal waste permit. Leaf waste composting, however, is allowed as a "Permit-By-Rule", provided the process is approved by PADEP. PADEP has developed guidelines for an acceptable leaf waste composting process under the Permit-By-Rule Program.

The PADEP Guidelines for Yard Waste Composting Facilities (effective date September 1, 1997) apply to yard waste composting facilities of less than five acres that adhere to certain siting, design, and operational requirements in the Guidelines. The Municipal Waste Management Regulations (Title 25 Pa Code, Section 271.103(h)) allow such yard waste composting facilities to operate under a "Permit-By-Rule", if they comply with the Guidelines. Compost facilities between five and fifteen acres in size may be allowed to operate under an existing PADEP General Permit (GP) for composting facilities, provided the proposed activities are consistent with the existing GP, and are approved by PADEP. For the 5-15 acre compost sites, PADEP requires the submittal of Form 27, "Acceptance of General Permit Conditions", as part of this process. PADEP then makes a "Determination of Applicability" based on the information provided by the applicant requesting approval to operate under the GP. In Adams County, most, or all, municipal yard waste composting facilities should be five acres or less.

The composting process recommended in the Guidelines is outlined in Section 4.8.3 (low-level technology), and a copy of the PADEP Guidelines for Yard Waste Composting, dated September 1997, is included in Appendix A of the Plan. This guidance document also addresses land application of yard waste. Typically, land application involves spreading leaves, or other yard waste material, on farm fields where it is tilled into the soil.

Grass clippings can make up one-third to one-half of all yard waste. Generally, grass clippings may not be composted without a PADEP permit. However, the PADEP has developed guidelines for yard waste composting which enable grass clippings to be processed with other yard wastes at a Permit-By-Rule yard waste composting site, as long as compliance is maintained with specified operating restrictions. The most significant of these restrictions is that grass cannot be processed at a rate of more than one-part grass to three-parts other yard waste.

Yard wastes can be composted with nearly any other organic waste including waste paper, sewage sludge, animal manures, and food processing wastes. Yard wastes, particularly leaves, are a desirable complement to high-moisture, high-nitrogen wastes such as sludge and manure. It is assumed that much

of the yard waste materials generated in Adams County are handled on-site, or disposed of through burning and illegal dumping.

4.8.2 Yard Waste Collection

There are generally two basic methods used to collect leaves: loose collection or containerized collection. Loose collection is not appropriate for general yard wastes such as grass clippings.

Loose collection of leaf waste can be accomplished using a vacuum loader or front-end loader. Vacuum loaders can be purchased with a box to hold the collected leaves, or they can be used with dump trucks or boxes built by municipal workers. While a front-end loader with the standard bucket attachment is not particularly efficient at collecting leaves, it is commonly used because it is readily available in many municipalities. There are several types of special "pincer" type buckets that can be attached to a front-end loader to improve its suitability for yard waste collection. In many yard waste programs, front-end loaders are used in conjunction with dump trucks or garbage packers.

Containerized collection is the method used when yard waste is placed in a bag or plastic container by a resident, and placed at the curbside for collection. Standard, degradable 30-gallon paper bags are commonly used by residents for containerized collection. Use of biodegradable plastic bags, or kraft paper bags, eliminates the need to empty the bags (they can be composted with the leaves), but can add cost to the program.

Another option for containerized collection is the use of plastic bins. The use of reusable plastic bins is becoming a popular method of collecting yard waste.

Yard waste can be collected by municipal crews, or by a municipally-contracted private hauler. Municipalities, such as the Boroughs of McSherrystown and Gettysburg, as well as a small number of townships, provide drop-off locations for other yard waste (e.g. brush, tree trimmings). The Washington Township Transfer Station (Franklin County) accepts yard waste materials for a fee (leaves are accepted free of charge), as do some private contractors operating within the County (See the Adams County Recycling and Waste Management Information Brochure).

4.8.3 Composting Process Options

The composting process requires organic matter (such as leaf waste or grass clippings), microorganisms (occurring naturally in the leaves), heat (naturally occurring), water, and oxygen to proceed properly. The various approaches to composting can be ordered into the following four general categories:

No Technology ("sheet composting") - The material is spread over a field, eventually plowed under, and allowed to decompose naturally without further intervention. The PADEP Permit-By-Rule Program can be used with land application of leaf waste on farm fields.

Medium Technology (Aerated Static Pile) - The yard waste material is piled over perforated piping. The material is aerated by blowing air out of the pipe and into the pile, or by drawing air through the pile and into the pipe. This method produces compost in less than 12 months, but is moderately capital intensive.

High Technology (In-Vessel Method) - Material is composted in a fully enclosed, mechanical system. All of the environmental factors that affect the decomposition process can be controlled, allowing the first stage of composting to be completed in a very short period of time. In-vessel composting is generally

applied to composting of more general municipal solid waste and sewage sludge, rather than yard waste alone. This is very capital intensive.

Low-Level Technology (Windrow Method) - This is the most common method of leaf composting, and the method specified in the PADEP Guidelines (described below). This method usually produces compost in approximately 12-18 months, and is low to moderately capital intensive.

The design and operating considerations for a low-technology leaf composting facility are discussed below. The discussion notes the PADEP guidelines, where applicable. The process is also adaptable to leaf and grass co-composting. Grass clippings can be added to existing leaf compost piles from the previous autumn. This mixing benefits both the grass and the leaf composting process.

- (a) **Siting:** Zoning, access roads, water supply, soil grade, and drainage characteristics must be considered. A buffer zone, needed for odor control, should be sized according to the closest neighbor and PADEP guidelines on isolation buffer distances. The PADEP guidelines require a minimum of one acre of site for each 3,000 cubic yards of vegetative material being processed.
- (b) **Windrow Size:** PADEP guidelines require the pile to be 6-8 feet high and 12-16 feet wide. The pile can be extended to as great a length as desired.
- (c) **Pile Building:** Front-end loaders are used to build the piles. PADEP recommends that piles be built within two days of the delivery of material to the site. If grass clippings are being composted, to avoid odor problems they should be incorporated the day received, and at a leaf to grass ratio no lower than 3:1.
- (d) **Moisture:** The moisture content should be maintained at approximately 50 percent. Water should be added, if needed, when the piles are being formed, and when they are being turned. The PADEP guidelines support this moisture level.
- (e) **Pile Turning:** Piles are usually turned with a front-end loader, or with specially-designed mixing equipment. Turning is necessary for wetting the outer edges, re-aerating the material, and insuring that all material is exposed to the high temperatures characteristic of the center of the pile. Piles are turned at least every two months; however, more frequent turning will increase the rate of decomposition. The PADEP guidelines require a minimum of two turnings per year. With incorporation of grass, more frequent turning is required; during some periods, daily or semi-weekly turning may be necessary.
- (f) **Curing:** In late summer the material is combined into large curing piles to make room for the next leaf deliveries. Curing allows for further decomposition, and can be for as little as one month to as much as one year. Curing piles usually do not emit any odor.
- (g) **Shredding and Screening:** Shredding and screening are optional finishing steps that provide for a uniform end-product, thereby enhancing the market value of the material. Both processes, however, are labor-intensive and increase capital and operational costs.

4.8.4 Compost Distribution

Clean yard waste compost is a commonly marketed compost material that usually has many local end users. Finished compost can be made available to residents, nurseries, landscapers, and farmers (it is often

given away free to local residents). Compost can be used as a soil amendment. Municipal crews can use it for reseeding, to hold soil moisture, and for landscaping projects. Composted materials are also commonly used in stormwater management tools (like filter socks). Municipal programs usually have to expend some effort and resources in notifying potential users of the compost's availability. Given the high transportation costs relative to the compost's value, the compost users generally will be located close to the compost source. Without advanced finishing steps such as screening and bagging, municipal market value for most composted material is minimal.

4.8.5 Composting Program Operation Alternatives

A simple yard waste compost program alternative is to deliver the yard waste material directly to a farm or nursery. Farmers can compost the material in static piles or windrows before use, or allow the material to compost on a fallow field. Alternately, raw yard waste material may be tilled directly into crop fields, and allowed to decompose in the soil mixture. If this is done, the yard waste decomposition process may use soil nutrients, such as nitrogen, that may need to be replenished through fertilization of the field.

One disadvantage of direct delivery to an interested farmer or nursery, if one can be found, is that the farmer or nursery may abruptly discontinue acceptance of the material. Other disadvantages to this method are the potential limitations on the materials that can be collected, and on the collection methods. For example, clean, unbagged leaves are sometimes the only material that will be accepted by a farmer or nursery.

Yard waste composting and compost product distribution can be done privately, by municipalities acting individually or cooperatively, or by the County. The use of special composting equipment such as a turning machine, tub grinder, and screening equipment is more cost-effective when the equipment is shared among several municipalities. When hauling costs are considered, it is generally more cost-effective to use several compost sites located strategically across the County. A strategic compost site location would likely be close to the major yard waste sources, close to transportation routes and end users, and be located where municipal cooperation allows for resource and equipment sharing. Two or more neighboring municipalities may find it advantageous to share both a site and equipment.

4.8.6 Adams County Initiatives in Yard Waste Management

Butler Township received recycling grant funding in 1995 for a wood chipper and thermometer to establish a leaf and yard waste composting site for residents. Arendtsville and Biglerville Boroughs submitted letters of support, expressing an interest in participating in the project. DEP had been contacted to assist in bringing the Township into compliance with the Permit-By-Rule Regulations governing composting sites. Butler Township closed its drop-off yardwaste and composting site that accepted leaves, brush, Christmas trees, grass, and trimmings from residents, and produced mulch and compost for use by residents because of ongoing littering and dumping problems at the site.

Carroll Valley Borough received recycling grant funding in 1996 for a leaf vacuum truck to remove leaves from the Borough's streets. The Borough planned to establish a composting site for leaves and yard waste for residents. Fairfield Borough submitted a letter of support expressing interest in participating in the project. The project never moved forward on a municipal level. Carroll Valley discontinued allowing residents to drop off leaves and grass at their Maintenance Building because of littering and dumping problems. Residents are referred to the Washington Township Transfer Station yard waste management site.

Conewago Township directs its residents to take yard waste materials to a privately operated drop-off site (H&H General Excavating) in Spring Grove, York County, and contracts leaf and yard waste collection services with their hauler for curbside pickup (spring, summer, and fall). The Township's waste collection contract also includes collection of Christmas trees by the Township's waste hauler.

Cumberland Township received recycling grant funding in 1993 for a wood chipper and thermometer to establish a leaf and yard waste composting site for Township residents. Gettysburg Borough and Highland Township submitted letters of support expressing interest in participating in the project. To date, no program has been established.

Fairfield Borough's waste collection contract includes the collection of Christmas trees.

Germany Township received recycling grant funding in 1997 for a wood chipper to assist with processing yard waste. Germany chips Christmas trees and makes the mulch available to residents.

Gettysburg Borough transports their leaves to the Adams County Correctional Facility where they are composted through a low-impact process involving turning the pile several times a year. The Correctional Facility utilizes the material in a prison gardening program. The Borough also maintains a drop-off site for Christmas trees and yard trimmings; this material is chipped by the Borough and made available to residents. Yardwaste is collected curbside by the Borough's contracted hauler three times a year (spring, summer, and fall).

Littlestown Borough accepts Christmas trees and leaves from residents and provides the mulched materials to local farmers.

McSherrystown Borough received recycling grant funding in 1993 for a wood chipper and a thermometer to establish a leaf and yard waste composting site for residents. East Berlin and Littlestown Boroughs entered into agreements with McSherrystown for the shared use of this equipment. McSherrystown established a yard waste composting site for its residents and accepts leaves, brush, grass, Christmas trees, and trimmings. The composted material is made available to local farmers. DEP was contacted to assist in bringing the Borough into compliance with the Permit-By-Rule regulations governing composting sites.

Menallen Township received recycling grant funding in 1998 for a wood chipper and thermometer to establish a leaf and yard waste composting site for residents. Bendersville Borough and Tyrone Township submitted letters of support expressing an interest in participating in this project. Menallen Township operates a composting site, and accepts Christmas trees, leaves, brush, grass, and trimmings from residents to produce mulch and compost for use by residents. DEP was contacted to assist in bringing the Township into compliance with the Permit-By-Rule Regulations governing composting sites.

Mt. Joy Township accepts Christmas trees from residents, chips the material, and makes the mulch available to residents.

Mt. Pleasant Township accepts Christmas trees from residents, chips the material, and utilizes the mulch in Township operations.

New Oxford Borough's waste contract includes the collection of Christmas trees.

Oxford Township accepts Christmas trees from residents.

Reading Township accepts Christmas trees, leaves, and brush from residents. These materials are then collected by H&H General Excavating and processed at their site in Spring Grove.

Straban Township received recycling grant funding in 1999 for a wood chipper, to establish a leaf and yard waste composting site for residents. Mt. Joy and Mount Pleasant Townships submitted letters of support expressing interest in participating in this project. Straban Township operates a composting site, and accepts Christmas trees, leaves, brush, grass, and trimmings from residents to produce mulch and compost for use by residents. DEP was contacted to assist in bringing the Township into compliance with the Permit-By-Rule Regulations governing composting sites

It is important to note that most of the municipality contracted waste collectors accept Christmas trees and bundled brush under the large-item contract option.

It is also important to note, that Adams County is a rural area and many of its residents manage yard waste materials onsite.

4.8.7 Backyard Composting

Composting by individuals in their own yards is an activity that can be encouraged, regardless of whether the municipality has its own composting program. By reducing the amount of yard waste collected, backyard composting saves collection and composting costs, and provides the homeowner with his or her own supply of valuable compost. Backyard composting is most suitable for grass clippings and vegetative (not meat) food wastes. In addition to backyard composting, grass clippings can be left on the lawn as natural fertilization (using a mulching mower). Backyard composting bins were distributed to many residents, through the Penn State Cooperative Extension Master Gardener Program. Approximately 800 bins have been distributed to residents completing a very popular composting training workshop. Additional information on backyard composting is available through the County, Penn State Cooperative Extension, and PADEP.

4.9 OPTIONS FOR ENCOURAGING PARTICIPATION IN RECYCLING PROGRAMS

Increasing participation in municipal recycling programs requires continuous educational efforts. Regardless of the specific program structure, getting the information about the program to residents on a continuous basis will improve its success and participation. Public education programs should convey the importance, yet ease, of the recycling program. Children should be targeted by these programs as they get excited about recycling and can have a large influence on their parents' recycling participation.

Social pressure can be very persuasive to certain individuals within the community. The perception that recycling has strong community support can help to motivate people to recycle. Recycling containers should be very visible and identifiable as for-recycling.

Keeping recycling requirements simple, distributing home storage containers with an instructional brochure enclosed, and publicizing the recycling program procedures through direct mail, the local media, and various websites are several ways to overcome the informational barrier to participation. In addition, education should be reinforced, as needed, to ensure that participants are not only aware of the program, but also that they follow the correct procedures and adhere to the list of acceptable materials in the program. One of the biggest challenges facing recycling programs is contamination in recycling collections. Contamination may render the materials not recyclable, increase processing costs, and affect the marketability of processed materials.



Incentives may be used to motivate people to recycle. In some cases, financial incentives like a pay-per-bag garbage fee may be successful. The system goes by the concept that people will receive a cost savings (per bag) if they minimize their waste generation. Conversely, mandatory recycling ordinances have also been used as a financial disincentive for those who fail to participate. Conewago Township and Gettysburg Borough encourage recycling by limiting residents to three (3) bags of waste per weekly collection.

The responsibility for public education can be shared by the County, municipalities, and various partners. The County, through its Office of Planning and Development, provides a variety of recycling educational materials and is available to provide presentations to municipalities, special interest groups, commercial and institutional establishments, and local school districts. The County can also assist municipalities and their contracted haulers in tailoring their educational materials to their specific programs. Community-specific promotional materials have the advantage of harnessing community pride to generate interest, and boost participation. Even for program-specific public education efforts, the County has, and will, provide assistance, such as model brochures, names of printers, and cost information. Recycling education grants (up to 90%) are available from PADEP to help with the development of recycling education materials.

Costs of developing a recycling program, whether curbside or drop-off, or a mandatory or non-mandatory program, are specific to each municipality or group developing the program. The County can assist in providing recycling program cost analysis and guidance to any municipality or group that seeks assistance in developing a program.

The Adams Rescue Mission publishes information on their recycling services in the County's only local news publication.

Other initiatives include distribution of a comprehensive recycling and waste management brochure by the County through various outlets, such as its website, Community Welcome, the Gettysburg-Adams County Area Chamber of Commerce, all of the municipalities, and other venues.

4.10 RECOMMENDED RECYCLING STRATEGY AND IMPLEMENTATION SCHEDULE

4.10.1 Goals and Objectives

The guiding objectives used in developing the County's recycling plan are to attain the maximum economically feasible recovery of material through recycling, and yard waste processing and composting, and to do so with the full support of the local municipalities.

The County intends to follow Act 101 guidelines that state: 1) mandated municipalities (the Borough of Gettysburg, Conewago Township, and Oxford Township) must curbside-recycle at least three source-separated recyclable materials from the list of eight materials designated by Act 101; 2) citizens in mandated municipalities must separate "leaf waste" (as defined by Act 101) for special handling (such as composting or agricultural utilization); and, 3) businesses and institutions in mandated municipalities must recycle at least three types of materials, plus leaf waste.

The County's recycling goal is to have a comprehensive recycling program that allows for convenient recycling opportunities for County residents that will include curbside collection, drop-off collection, and potentially include additional recycling services to meet county recycling and disposal needs.

The following is a list of County recycling program goals/ initiatives to be considered:

- Develop strategies to increase recycling in Adams County and, at the same time, reduce waste disposal.
- Address ways to reduce the cost of recycling and increase the rate of recycling and its efficiency, thus reducing overall collection costs (such as, make recycling a universal component of waste collection contracts, instead of optional.)
- Maintain and potentially develop further curbside collection in feasible areas.
- Expand drop-off collection services to be available to all County residents (working in partnership with the Adams Rescue Mission and municipalities.)
- Develop additional recycling collection events (like the Apple Harvest event; working in partnership with the Adams Rescue Mission or private collectors).
- Continue existing yard waste efforts and partner to expand yard waste collections and options (such as joint yard waste composting initiatives).
- Work with the Adams County Food Policy Council to expand food recovery and recycling efforts in the County.
- Work with local municipalities and community partners to improve the effectiveness of existing recycling programs through a comprehensive public information and education program.

- Continue to work with municipalities and existing haulers to encourage recycling.
- Continue to improve data collection on the recycling that is occurring in the residential, commercial, and institutional sectors.
- Use recycling efforts and educational efforts related to recycling as a means to deter illegal dumping activities and open burning, through identifying recycling as an alternative to dumping and burning.
- Identify funding sources to be used to help implement County recycling goals.

Many of these initiatives are underway. The County, through its Office of Planning and Development, has assisted, and will continue to assist, various municipalities with implementation of their waste collection contracts. These contracts contain curbside recycling and bulky waste service options. The Office of Planning and Development has also assisted with the addition of covered device recycling in many of the municipal waste collection contracts, and will seek to expand this effort to additional municipalities. And lastly, the County has implemented its transporter registration program to include recyclers as a means of obtaining further information on recycling activities in the County. The County will continue to work on these issues and other goals/initiatives over the course of its next planning period.

4.10.2 Development of Drop-off Programs

The County should continue to support drop-off efforts for diverting recyclable materials from the waste stream; and continue to encourage and assist in the development of municipal and other drop-off programs for recyclables throughout the County. Special attention will be given to education for existing programs and the development of new programs in areas with limited recycling opportunities. Strategically located drop-off sites will reduce inconvenience to residents that may have to drive long distances to a centrally-located drop-off site. The County can provide guidance and assistance to municipalities interested in siting drop-off centers and developing recycling drop-off programs.

Drop-off collection sites require a minimal amount of equipment and site preparation to develop. Site preparation may include costs such as paving, fencing, lighting, security provisions, and the purchase of collection bins. Equipment and site improvement costs are up to 90 percent reimbursable through Act 101-Section 902 recycling grants.

The County plans to continue to support the recyclable material drop-off programs operated by the Adams Rescue Mission. All recycling activities undertaken by the County will continue to be performed in full compliance with applicable regulations.

4.10.3 Yard Waste Program Development

To maximize the amount of yard waste diverted from disposal, and to do so in the most efficient manner possible, the County plans to continue to assist, as requested, municipalities that wish to develop yard waste programs. The County assistance program (includes technical and grant writing assistance) is available to all municipalities that want to participate.

4.10.4 Public Education Program

The County intends to continue to play a role in educating the public and municipal officials about recycling and yard waste management, as well as other aspects of solid waste management. The County

is a key partner with the Adams County Council of Governments. The County's public education program is designed to complement the activities of local municipalities in order to maximize the effectiveness and efficiency of all public education efforts; the educational and outreach efforts target not only households, but also schools and commercial and institutional establishments.

4.10.5 Consideration of Existing Recyclers and Coordination with Recycling in Mandated Municipalities

Act 101 requires that the County Plan describe what consideration has been accorded to persons engaged in the business of recycling (as of September 26, 1988), and explain how recycling under the County Plan will be coordinated with, and will not interfere with, recycling by mandated municipalities. The previous parts of this section pointed out how the County's recycling strategy is based primarily upon continuation of the present municipal and other recycling programs in the County. The recycling strategy outlined in this Plan will be integrated with any newly added municipal recycling programs, and with all non-profit and/or for-profit recycling drop-off operations.

4.10.6 Recycling Program Implementation Tasks

The tasks involved in implementing this proposed recycling strategy in the County are outlined below with projected implementation schedules.

RECYCLING PROGRAM – STRATEGIC PLAN

Curbside Recycling Programs

- Assist municipalities in making curbside recycling a universal component of waste collection contracts (will occur on an ongoing basis).

Drop-Off Recycling Programs

- Evaluate drop-off programs options/opportunities (will occur on an ongoing basis).
- Assist in development of commercial/industrial collection programs (will occur on an ongoing basis).
- Identify additional recycling markets through investigation (will occur on an ongoing basis).
- Promote municipal drop-off programs (will occur on an ongoing basis).

Yard Waste Composting

- Continue existing programs and expand as feasible (will occur on an ongoing basis).
- Identify additional opportunities (will occur on an ongoing basis).
- Provide technical assistance (will occur on an ongoing basis).

- Assist with site preparation and operation by municipalities or other entities (will occur on an ongoing basis).

Public Education Program

- Continue the County's educational program efforts with focus on residents, schools, and businesses (will occur on an ongoing basis).
- Determine municipal needs (will occur on an ongoing basis).
- Continue to support program structure (will occur on an ongoing basis).
- Design, produce, and distribute educational materials (will occur on an ongoing basis).
- Research funding alternatives (will occur on an ongoing basis).

Recyclables Quantities Documentation

- Continue to hold transporters accountable for data collection, as specified in the newly revised transporter registration program in the County that requires transporters to submit recycling data to the County (will occur on an ongoing basis).
- Enhance the annual reporting program for recyclables (types, quantities, and sources) collected for Act 101 (will occur on an ongoing basis).

CHAPTER 5 | SELECTION OF WASTE MANAGEMENT SYSTEM

5.1 INTRODUCTION

The purpose of this Chapter is to describe the process used to select or recommend components to the overall waste management system for Adams County, and to provide justification for the selections and recommendations. The County must ensure that the recommended system provides the required capacity needed to properly dispose/process all municipal solid waste generated within its boundaries in accordance with Act 101 requirements. This Chapter examines collection, transportation, and disposal/processing alternatives, particularly for municipal solid waste, construction/demolition debris, and sewage sludge. Other fractions of the waste stream are also addressed, where appropriate.

Chapter 4 examined options for collecting and processing source-separated recyclable materials and yard wastes. The Adams County recycling strategy, and the quantity of waste expected to be diverted due to recycling and composting, is expected to remain fairly constant, and possibly increase slightly over the new planning period. Table 5-1 depicts gross generation estimates, and actual disposal and recycling quantities, for the County over the period 2014 through 2017.

Section 5.2 discusses options for collecting municipal solid wastes. Section 5.3 discusses alternatives for transporting wastes to processing or disposal facilities, and evaluates the costs of direct hauling and transfer hauling of wastes. Section 5.4 briefly describes the technologies that can be employed to process and/or dispose of this waste, and addresses the process used to secure waste disposal capacity for disposal of Adams County's wastes for the 10-year planning period to January 1, 2029. Section 5.5 evaluates future options for sewage sludge and septage disposal in Adams County. Section 5.6 briefly addresses the handling of special wastes in the County. Section 5.7 concludes with recommending waste collection, transportation, and disposal/processing strategies for the County. The summary description includes waste collection, waste reduction and recycling, transportation, disposal, construction and demolition waste, and special waste discussions. The selection of disposal facilities to be designated for disposal of Adams County municipal solid wastes is discussed, as well as a procedure to add additional facilities to the Plan in the future.

5.2 COLLECTION ALTERNATIVES

Act 101 divides the responsibilities for municipal waste management between counties and local municipalities. Counties have the power and duty to designate the disposal and/or processing site(s) for waste generated in the County. Municipalities have the power and duty to regulate the collection of waste generated within their boundaries. This section describes a municipality's three principal options for municipal solid waste collection. The discussion addresses the collection of household waste. The three options are differentiated according to the degree of municipal involvement and, conversely, the role of the private sector.

TABLE 5-13: PROJECTED MSW GENERATION & ACTUAL DISPOSAL AND RECYCLING

PROJECTED GROSS GENERATIONS OF MSW AND ACTUAL WASTE DISPOSAL AND RECYCLING FIGURES					
YEAR	POPULATION ¹	GROSS GENERATION (TONS) ⁽²⁾	DIVERSION RATE ⁽³⁾	ACTUAL WASTE GENERATION (TONS) ⁽⁴⁾	ACTUAL WASTE DIVERTED TO RECYCLING (TONS) ⁽⁵⁾
2014	103,802	88,232	43%	62,816	38,249
2015	104,400	88,740	47%	59,183	41,278
2016	105,264	89,474	43%	62,975	38,576
2017	106,128	90,209	51%	63,223	45,861

⁽¹⁾ 2014 - 2017 Population Data: Adams County Office of Planning and Development

⁽²⁾ Projected Waste Generation based on a per capita rate of 0.85 tons x population.

⁽³⁾ Diversion rates based on Adams County Annual Recycling Reported tonnage divided by gross generation x 100 %

⁽⁴⁾ Actual Waste Generation = Tonnages from PADEP Municipal Waste Disposal Information (MSW + C/D + Sewage Sludge)

⁽⁵⁾ Actual Waste Diverted to Recycling from Act 101 Reports

5.2.1 Private, Non-Contract Collection

Under private, non-contract collection, the municipality has little or no involvement in municipal waste collection. Individual residents and businesses subscribe with a private hauler for waste collection services. A municipality may have an ordinance regulating storage and collection practices. Private, non-contract collection can be satisfactory if: 1) the municipality assures that minimum standards of service quality are met; 2) there is sufficient competition; and 3) excessive numbers of haulers are not operating in any particular area. The municipality has no control over the disposal site used for waste disposal under a non-contract system. However, Adams County has established a transporter registration program that requires municipal solid waste generated within the County to be disposed by haulers (including private, non-contracted haulers) at designated facilities under contract with the County.

With this system, competition may help protect the consumers from high, monopolistic prices. On the other hand, the existence of more than two or three haulers servicing a given area tends to result in inefficient routes and higher costs than necessary. As the number of haulers servicing an area increases, the likelihood increases of collection-day nuisances and increased truck traffic. Haulers may also use different days of the week to collect from an area, which may become confusing to both haulers and residents.

In non-contracted areas of Adams County, customers are generally paying higher costs for collection services than in areas with municipal collection contracts. Municipalities in Adams County that have begun to bid waste collection contracts (Section 5.2.2 below) to individual haulers (in most cases only for residential services) have generally seen a drop in the price customers pay for collection services, in comparison with prices they previously paid for non-contracted collection services. Whether this trend continues will most likely depend on whether competition between the waste collection companies remains under the municipal bid option.

In Adams County, only ten of the thirty-four municipalities use private, non-contract (private subscription) waste collection services.

5.2.2 Private, Municipal-Contract Collection

A municipality can avoid some of the potential waste collection problems in a non-contracted collection system by awarding one, or more, competitively bid contracts for waste collection. Depending on the contract terms, this approach can often be both cost-competitive and cost-effective. Competition can be promoted through periodic re-bidding (usually on a three to four year term). Contract terms should not be so stringent that only one or two very large firms are capable of bidding. A larger municipality can foster competition, without sacrificing collection scale and route economies, by awarding multiple contracts for different collection zones. In some cases, several municipalities combine in a single bid process, to obtain a better bid price by offering a larger number of customers in the bid. Municipal councils of governments are sometimes used for this purpose.

Municipal bidding of waste collection services also gives the municipality the opportunity to designate by contract, if it wishes, where the successful bidder will dispose of collected wastes. This can be an important factor in securing a waste stream for delivery to a specific disposal site.

In Adams County, twenty-four municipalities bid for waste collection services, either jointly or separately.

5.2.3 Municipal Collection

When feasible, municipalities may go a step further than contracting, to exercise greater control of municipal waste collection by owning trucks, and using municipal crews, to conduct household (and possibly also commercial) refuse collection. Municipal collection, if properly managed, has the potential to be cost-competitive, or even lower in cost, than the private collection alternates. Municipal collection is generally most effectively implemented in municipalities that already provide relatively extensive public works services, such as in older, densely developed communities. Infrequently, a county purchases trucks and provides collection services to county residents. There are no municipal waste collections in Adams County. However, it is interesting to note that Gettysburg College purchased several refuse compactor trucks to service their campus complex and they transport their waste to a designated disposal site.

5.3 TRANSPORTATION ALTERNATIVES

There are two basic options available for transporting municipal solid wastes to disposal sites: a direct haul system and a transfer haul system. In a direct haul system, municipal waste is conveyed by collection vehicles from the collection route directly to the final disposal site. In a transfer station, or transfer haul system, the collection vehicles convey the wastes from the collection routes to a transfer station facility. The waste from the smaller collection vehicles is then loaded, or transferred, into larger-capacity trucks that haul the waste to the final disposal site. A combination of direct haul for some routes and transfer haul for others may also be cost-effective.

5.3.1 Direct Haul

Direct haul systems are the simplest, most common, and least expensive transportation systems, provided the distance from the collection route to the disposal site is not too great. As the haul distance increases, operating costs increase, and the efficiency of the direct haul system decreases. Nonproductive labor

time, vehicle maintenance costs, and overall operating costs increase because more time is being spent traveling to and from the disposal site, rather than on the daily collection route(s). At some point, the haul distance, or the time of travel, becomes too great for direct haul to be cost-effective, and a transfer station system becomes an economical alternative.

5.3.2 Transfer Haul

The primary benefit of a transfer station is improved access to the solid waste collector. The advantages of constructing a transfer facility can include the following:

- **Economy of Haul** - Transfer trailers can haul legal payloads of 18 to 25 tons compared to the 5 to 10 ton capacity of typical solid waste collection vehicles.
- **Reduced Maintenance Costs** - Since collection vehicles do not make the trip to the disposal facility, overall collection mileage and maintenance costs are reduced.
- **Reduced Capital Cost for Collection Vehicles** - One transfer trailer can replace several collection vehicles, and can keep collection vehicles on the collection route more hours of the day, thus reducing the required fleet size.
- **Disposal Flexibility** - The transfer and truck haul of solid waste allows for a transportation system that is highly flexible, and does not restrict the location of the solid waste disposal facility(ies) utilized. More distant disposal sites may still be practical options, if the tipping fees there are reasonable.
- **Increased Opportunities for Small Haulers** – Access to a local transfer station provides an improved opportunity for smaller haulers to operate, and provide services, in the surrounding area. With access to a nearby facility, small haulers can be more competitive with the larger haulers that can sometimes monopolize the hauling industry.

The construction and operation of a transfer station requires additional capital and operating costs for the extra step in the solid waste management system. Whether or not the costs are economically justified depends on the details of the particular situation. The economically optimal transportation method largely depends upon the amount of waste involved, and the distance and travel time to the disposal site. Where short hauling distances are involved, transfer haul is usually not cost-effective or warranted.

5.3.3 Existing Transfer and Haul Facilities

Adams County has no in-County designated disposal facilities. Most of Adams County's municipal waste is currently hauled between 25 and 35 miles one way to out-of-County disposal sites. As reported by PADEP waste destination reports, in 2017 there were 53,540 tons of Adams County municipal waste hauled long-distance (one way) to Mountain View Reclamation Landfill, Modern Landfill, Blue Ridge Landfill, Cumberland County Landfill, and the York Resource Recovery Center.

There is one municipal waste transfer station in Adams County (Neiderer Sanitation). There are also several operating transfer stations located nearby in adjacent counties. The Hanover Area Transfer Station (in York County), the Washington Township Transfer Station (in Franklin County), and the Diller Transfer Station (in Cumberland County) are three out-of-County transfer facilities that receive and transfer waste generated by Adams County residents. All of these facilities are described in more detail in Chapter 2. Adams County entered into agreements with all of these facilities, and waste received by the facilities is disposed at one of the designated facilities listed in this Plan.

5.4 DISPOSAL AND PROCESSING ALTERNATIVES

5.4.1 Introduction

This section presents an overview of municipal waste processing, as well as disposal alternatives and technologies available to Adams County.

The following section briefly highlights Adams County's waste management system and planning history.

5.4.2 Background

Under Pennsylvania Act 101 and the Pennsylvania Department of Environmental Protection Rules and Regulations, Adams County must update the County Municipal Solid Waste Management Plan every ten years. Adams County has updated its Plan and has been involved with tasks related to the current Plan Update process for the past several years (See SWAC Meeting Minutes in Appendices).

Adams County began developing its first Act 101 County Municipal Waste Management Plan in 1989. This Plan designated disposal of all municipal solid wastes generated in the County at several out-of-County waste processing and disposal facilities. Contracts for disposal of County wastes were subsequently negotiated with four out-of-County landfill facilities, as well as a “spot market” agreement with the York County Resource Recovery Center. The 1992 Plan was ratified by the County and received PADEP approval on June 15, 1994.

Adams County issued a subsequent RFP in 2002 and entered into new contracts with municipal waste disposal sites to secure an additional ten (10) years of disposal capacity. Three landfill facilities entered into waste disposal contracts with Adams County. These contracts established maximum tipping fees, as well as other terms and conditions, for disposal of Adams County wastes at those sites. Adams County did not commit any minimum tonnage delivery to any site under the waste disposal contracts. The York County Resource Recovery Center continued to offer Adams County disposal capacity on a “spot market” basis. The Cumberland County Landfill petitioned to become a designated disposal site in 2009. Waste haulers were free to utilize a contracted waste disposal site or sites of their choice, unless directed to a specific disposal site by the waste generator, or in the case of a municipal bid contract, by the municipality.

The Plan update process was extended and the Plan was not completed and approved until 2005, so with Department advisement Adams County secured additional disposal capacity with all contracted facilities through December 31, 2018.

The latest RFP process, the respondents to the RFP, and the disposal facilities that have entered long-term disposal contracts with Adams County are discussed in further detail in Sections 5.7.5.2 of this Plan. It is important to note, that throughout its history of securing waste disposal and processing capacity per Act 101, Adams County has always directed municipal waste to be disposed at designated facilities within its Plan. Adams County follows an “open menu” Plan, and allows any facility to petition to be in its Plan at any time (See Section 5.7.5.3 Procedure to Add Facilities to the Plan as Designated Facilities).

The Blue Ridge Landfill, operated by Waste Connections, has continued to be the primary disposal facility for the majority of Adams County municipal solid waste.

The following sections briefly describe processing and disposal technologies available to Adams County.

5.4.3 Landfill

Sanitary landfilling is an engineered method of disposing of solid waste on land. State and Federal environmental regulations, and advances in design technologies, have combined to minimize the impact of sanitary landfills on the surrounding environment. The PADEP Municipal Waste Regulations require all new and existing (operating) landfills to be designed with a double liner system, with leachate and methane gas collection and detection elements. In addition, after closure of the landfill, the disposal area is required to be capped with a low-permeability liner system to restrict the downward flow of precipitation into the waste material.

A landfill can accept a broad variety of materials including sewage sludge, construction and demolition waste, and incinerator ash, as well as municipal and residual wastes. Handling of these materials as well as bulky items such as furniture, building materials, and large appliances can be difficult. Further, special permit modifications are required for the disposal of sewage sludge and incinerator ash. For these reasons, not all landfills accept all of these materials.

The chief environmental concerns associated with landfilling waste are leachate contamination of groundwater, the danger of explosions caused by migrating methane gas, atmospheric and environmental health hazards from landfill gasses, truck traffic, odor, litter, and the "eyesore" of the landfill site in general. Applications for new landfill permits in Pennsylvania must demonstrate that the "benefits" of the project clearly outweigh the "harms" or negative impacts. Development of a new sanitary landfill is also capital-intensive, with high permitting, land and site development costs. Typically, landfills are developed with throughput capacities of at least 500-1,000 tons per day, to take advantage of economies of scale, and to recoup capital cost investments. Some smaller (100-300 tpd), older landfills still exist in Pennsylvania, but many of these have either closed or are upgrading to larger operations.

5.4.4 Mass-Burn Resource Recovery (Waste-to-Energy)

In a typical mass-burn incineration facility, waste is unloaded into a receiving pit. An overhead crane feeds waste into the furnace hopper. The crane operator may pick out oversize items, such as large appliances, and will mix up the waste to insure a fairly homogeneous mix. Within the combustion chamber, the burning waste is transported along the moving grates of the stoker assembly or similar grate system. Heavy ash, called bottom ash, falls through the grates and is cooled with water. The hot combustion gasses pass through the combustion chamber and past boiler tubes to produce steam. Also, the walls of the furnace itself are typically fitted with a network of water-filled tubes that use heat to produce steam. The steam is often passed through a turbine to produce electricity. The steam may also be distributed to nearby establishments for heating and/or for use as a process steam.

A mass-burn incinerator can process approximately 98 percent, by weight, of the municipal solid waste stream. The quantity of ash residue requiring disposal will equal approximately 20-30 percent, by weight (by volume, approximately 10 percent) of the processed waste stream. The non-processibles (materials removed prior to combustion) and the unburned ash residues are usually handled through a combination of recycling and landfilling. The non-processibles, and especially the ash residue, involve special disposal considerations that may cause their disposal costs to exceed that of uncombusted municipal solid waste.

The chief environmental concerns of mass-burn incineration are air emissions of acid gases, heavy metals (e.g., lead, mercury), certain organic compounds, and contamination of air and water through improper handling and disposal of the ash residue.

State and Federal emissions control requirements, which mandate new facilities install scrubbers for acid gas control and electrostatic precipitators (ESPs) or fabric filters (baghouses) for particulate removal, are aimed at minimizing the risk of harmful health effects from solid waste incineration.

In general, waste-to-energy projects are very capital-intensive due to extensive equipment and building needs. Larger mass-burn facilities are generally constructed similarly to power utility plants with field-erected combustion and boiler systems, and can be economically feasible at sizes of greater than 750-1,000 tons per day. Smaller mass-burn facilities, in the size range of 50-300 tpd, are usually constructed with pre-fabricated, modular furnaces. Such modular systems have a lower capital cost, but generally have a somewhat reduced operating performance.

5.4.5 Refuse-Derived Fuel (RDF)

At an RDF facility, mixed waste is processed mechanically (and perhaps manually) into a form rendering it more suitable for use as a fuel. Typical processing steps involve size reduction, removal of noncombustible materials, and mixing.

The RDF product can be marketed to institutional or industrial facilities for use as a supplemental fuel in their existing boilers. Additional air pollution control measures may be required. If insufficient markets exist, the RDF can be burned at the RDF facility in a dedicated boiler. In Pennsylvania, PADEP requires a facility that burns RDF fuel to obtain a waste management permit, much the same way as a waste-to-energy facility does. This negatively impacts the prospects for developing an RDF project.

The fuel preparation process produces residuals requiring disposal; the quantity depends on the composition of the input waste and on the processing system. The process typically removes ferrous metal for recycling, and may separate other materials for recycling. If a dedicated boiler is used there will also be ash requiring disposal.

The potential environmental impacts of an RDF facility are similar to those of a mass-burn facility. There are additional concerns of worker health and safety due to the potential for explosions in the shredder, and exposure to airborne material such as bacteria and molds. RDF projects are very equipment, and capital-intensive. Finding a long-term user for the refuse-derived fuel material is critical to the financial feasibility of an RDF project.

5.4.6 Composting/Co-Composting

Composting is a biochemical process that breaks down the biodegradable organic material in waste into simpler, more stable compounds and carbon dioxide. The compost end-product is a humus, containing nutrients and minerals that can be used as a soil supplement. Although of lesser nutrient value than fertilizer or sewage sludge, the compost improves soil structure for root development, increases water retention in sandy soils, improves drainage in clay soils, and increases the exchange capacity (nutrient-holding capability) of soils. A quality compost product appears much like peat and has similar uses. A typical municipal refuse composting operation consists of the following four basic steps:

- Pre-processing - Preliminary processing consists of sorting, shredding (sometimes), removal of non-processibles (large non-compostables, mattresses, hoses, etc.), and preparation of a mixture suitable for composting. Some recyclable materials, particularly ferrous metals and glass, may be removed at this stage. The mixture of biodegradable materials is adjusted for moisture and nutrients, as well as particle size. A “dirty MRF” is often needed to properly pre-process the waste stream, and prepare a compost feedstock.

Solid waste is often composted with sludge (co-composting). This provides the nutrients and moisture necessary for composting of refuse. Water can be added if needed. The solid waste also acts as a bulking agent for the sludge composting.

- Biochemical decomposition - This composting stage makes use of naturally occurring bacteria, and other microorganisms, to break down the organic portion of the waste.
- Curing - Curing is required to assure that the process is complete. After a 1-2 months final curing phase, the material is usually considered sufficiently stabilized for unrestricted use of the final product.
- Product Finishing - The product is prepared for use through screening, packaging (if needed), and marketing.

Solid waste composting affects only the organic portion of the solid waste. Material such as glass, plastic, metal, rubber, and textiles would be screened out, and either be recycled or landfilled.

A composting facility can divert approximately 60-70 percent of the municipal solid waste stream from the landfill. The quality of the final product benefits from the removal of household hazardous waste, household batteries, and used motor oil. The residue sent to the landfill is largely inorganic in nature, and most of its soluble components have been removed.

A municipal waste composting project is moderately capital-intensive. The economic feasibility of MSW composting is highly dependent on the cost of other competing disposal alternatives (e.g. landfilling), and on the quality of local markets for the compost end-product produced.

5.4.7 Experimental and Emerging Technologies

Several new technologies are being developed and tested for the processing of solid waste, such as a proprietary process to convert solid waste into a cellulose fiber fluff. The fiber can be used in the manufacturing of paperboard, and as a carrier for fertilizers and hydromulch.

Another new technology is a process that converts paper and yard waste into ethyl alcohol and animal feed. This process could be useful if recovered waste paper is unmarketable. The process uses a low temperature acid hydrolysis procedure. The estimated process cost for this technology is extremely high in comparison to the more conventional solid waste processing and disposal options available to the County. A modified version of this process converts refuse to ethyl alcohol. A sterile sludge resulting from the process could be burned, releasing approximately 9,000 BTU per pound of material produced.

Gasification is a technology that has been available for several years and continues to be refined. This thermochemical process is more complex than waste incineration, and can destroy dioxin and furan emissions. It differs from waste-to-energy in that it produces a synthetic (syngas) product that can be combusted in a boiler system to produce steam for power generation, as well as a fixed carbon ash (char).

These processes are still in the commercial development phase.

Vermicomposting is an innovative composting technology that uses worms to compost various waste types. Some aspects of this technology are still in the research phase, but this composting method may potentially be used, particularly as a feasible method to process sewage sludge. Vermicomposting projects in the United States are typically limited to relatively small throughput facilities (under 10 tons per day). This method is described in more detail in Section 5.5.1.5.

5.4.8 Securing Waste Disposal Capacity For Adams County

5.4.8.1 Needs vs. Existing Capacity

Adams County's disposal need (municipal waste, before recycling) is approximately 262 tons/daily over the period of January 1, 2019 through January 1, 2029. Because the original disposal contracts were either at, or near, the end of their final contract extension periods, Adams County issued a Request for Proposals (RFP) for disposal capacity in October 2018 (see next Section). Adams County secured 1,287 tons/daily of available disposal capacity under new waste disposal contracts for the next planning period (not including Adams County's long-term agreement with the York County Resource Recovery Center.) See Table 5-2. Therefore, Adams County has secured the required long-term disposal capacity under the Plan. The County has met the requirements of Act 101.

5.4.8.2 Solicitation for Additional Capacity

A Request for Proposals (RFP) was issued by the Adams County Office of Planning and Development to solicit responses from interested parties to negotiate an agreement for providing disposal capacity, for municipal solid waste (MSW), including construction/demolition (C/D) waste, and sewage sludge generated in Adams County. This RFP process was conducted in accordance with the Adams County Municipal Solid Waste Management Plan update process, and also in accordance with PADEP requirements for a fair, open, and competitive solicitation.

The RFP was released to prospective vendors on October 31, 2018. The availability of the RFP was advertised in the online version of Waste Advantage magazine and in its Marketplace Section (from November 2 – 26), a national waste industry publication, and in the Pennsylvania Bulletin. Responses to the RFP were received on November 27, 2018. The RFP contained proposal instructions and information, a submittal form, a disposal facility questionnaire, and a draft Municipal Waste Disposal Capacity Agreement. Adams County received responses from four (4) facilities (Blue Ridge Landfill, Cumberland County Landfill, Modern Landfill, and Mountain View Reclamation Landfill). The list of facilities that responded to the RFP is found in Section 5.7.5.2. Figure 3-1 shows the locations of the RFP respondents (designated disposal facilities), and includes the York County Resource Recovery Center and transfer stations under contract with Adams County.

Evaluation of the proposals was based upon, but not limited to, a number of evaluation criteria contained in the RFP, that reflect the needs of Adams County. Proposal review criteria included the following considerations:

- a. **Completeness Review (forms that were required to be completed, submitted, or verified by Proposer)**
 - Submittal Form/ Proposed Tipping Fee Schedule
 - Disposal Facility Questionnaire

- Executed Form Accepting Terms and Conditions of RFP
- Non-Collusion Affidavit
- Disclaimer Statement
- Insurance Coverage
- Proposal Bond/ Security
- All Signatures/Corporate Seals

b. Evaluation of Proposals

Listed below are some considerations of Evaluation Criteria:

Disqualification Issues/Criteria:

- Put-or-pay and/or other punitive restrictions
- Failure to demonstrate ability and willingness to satisfy any and all compliance problems/requirements
- Any substantial deviations from standard contract terms that the Proposer deems non-negotiable

Comparative Criteria:

- The Not-to-Exceed processing/ disposal fee per ton for MSW in comparison with other Proposers
- Appropriateness of the basis for processing/disposal fee escalation
- The fee amounts proposed and required pursuant to Section 1301 of PA Act 101, or other applicable State or Federal regulations
- Sufficiency of facility volume capacity, including degree of non-dependence on additional permit approvals for the term of contract
- Willingness to specifically reserve air space or capacity at the facility for Adams County waste (guaranteed capacity for the County)
- Willingness to enter into a contract for the term of service stipulated in the RFP
- Contingency plans for continued waste disposal in the event of reduction in facility daily processing/disposal rate
- Regulatory compliance history
- Extent of proposed deviations from Contract Specifications in RFP
- Overall capabilities of the Proposer to provide the requested processing and disposal services
- Present compliance with State and Federal laws and regulations, and with all applicable Adams County ordinances and regulations
- Willingness to collect information regarding the Adams County Transporters Ordinance registration requirements
- In addition to the evaluation criteria listed above, the County considered such other factors that were deemed in the best interest of the County and its residents

c. Results

Of the four responding facilities, all four proposers substantially met all qualifying criteria established for the RFP review process. The County executed Municipal Waste Disposal Capacity Agreements with all of the RFP respondents.

The York County Resource Recovery Center is also listed in this Adams County Plan Update as a designated disposal facility, based on the existing disposal agreement with McSherrystown Borough and Adams County.

McSherrystown Borough executed a separate long-term disposal agreement with the York Resource Recovery Center beginning in 1989, and pays an annual fee for capacity reservation. Adams County maintains a long-term agreement with the Center on a “spot market basis.”

As described above, Adams County executed disposal capacity agreements with the qualified RFP respondents, and has also recognized the existing long term disposal agreement between YCRRRC and McSherrystown. Each of these facilities is listed in Chapter 6 of this Plan Update as a designated disposal facility.

5.5 SEWAGE SLUDGE PROCESSING AND DISPOSAL ALTERNATIVES

As indicated in Section 3.2, 21 municipal and 25 non-municipal wastewater treatment plants operate in Adams County. A very small percentage of the sewage sludge generated by those treatment plants is dewatered and landfilled (7500 wet tons annually). The greater remaining treatment plant sewage sludge, in liquid form, and all the County’s septage (also liquid) are either land-applied or delivered to an out-of-county wastewater treatment plant for processing and land application. Approximately 2 – 5 million gallons annually are generated from these sources.

5.5.1 Description of Alternatives

Land application is typically used for disposal of liquid sewage sludge, and landfilling is typically used for dewatered sludge cake disposal. Transportation of dewatered cake to distant sites using shared equipment was also reviewed as part of the analysis.

5.5.1.1 Land Application

Sewage sludge can be disposed by spreading it on, or injecting it into, farmland, or by applying it to abandoned mining lands, for the purpose of reclamation. Land application is historically the most simple and least costly method of disposing of sludge. Land application provides a means to dispose of sludge, as well as providing a source of nutrients for the receiving soil. Land-applied sewage sludge is typically in liquid form, although dewatered cake can also be land-applied. In Adams County, land-applied sewage sludge is typically in liquid form. Table 1-8 indicates municipal treatment plants that use land application as a current sludge disposal method.

As with other disposal methods, a PADEP permit is required to operate a land application site. Under Act 271 regulations, PADEP permits a hauler or municipal operation and not the individual land application site (this is the new “General Permit” program”). Under Act 271 guidelines, the hauler or municipal operation is required to send a 30-day notification to PADEP for site inspection and site approval.

The permit is issued for a particular sludge source, and states the maximum allowable rate of application of sludge. The application rate is based on characteristics of the sludge, the uptake rate of nitrogen by the crop grown on the site and soil, and other site characteristics of the site.

Environmental concerns associated with land application include possible nitrate contamination of underground drinking water sources, accumulation of heavy metals in the receiving soils, and high nutrient loadings to surface waters that receive runoff from the site. This concern is of importance with regard to Phase III of the Chesapeake Bay Watershed Implementation Plan.

There are several limitations to the use of land application for sludge disposal. Increasingly stringent regulation by PADEP has been restricting the availability of sites, as well as the maximum allowable annual and lifetime loadings of sludge on sites. PADEP has been seriously considering going to a phosphorus-based nutrient management system for sewage sludge application (like many of our neighboring states). EPA is now instituting phosphorus-based nutrient management plans for the disposal of animal manures, from larger farms, on land (Spring 2004). Should PADEP implement phosphorus-based nutrient management plans for sludge application, land availability for land application may become more limited, and allowable application rates for sludge may be lower than under Pennsylvania’s nitrogen-based nutrient management system. Depending on background levels of phosphorus already in the soil, a phosphorus-based sludge application program in Pennsylvania could have a very significant impact on reducing allowable application rates. This could quickly create a sludge disposal crisis in Adams County, where nearly all of the sludge generated in the County is land-applied.

The availability of land application sites has also been reduced in small proportions by the conversion of farmland into housing and commercial areas. A further limitation of land application is that having a permitted site does not insure a sludge generator of a constant disposal outlet. Weather conditions periodically limit the ability to apply sludge, such as when the ground is snow-covered or saturated. Also, unless the wastewater authority that generates the sludge owns the site, or has suitable provisions in its agreement with the landowner, the owner might choose to make a parcel unavailable for sludge application, or the owner might choose to do business with the most competitive disposal payment offer (which may be from out-of-County sources).

5.5.1.2 Landfilling

Sewage sludge can be disposed in a landfill. PADEP requires that the sludge be dewatered to a minimum solids content of 20 percent and meet certain quality characteristics. Table 1-8 indicates the municipal treatment plants that currently utilize landfills for dewatered sludge disposal. Three of the designated landfill disposal sites that responded to the Request For Proposals indicated their willingness to accept a maximum daily amount of dewatered sludge at their disposal sites.

As a special handling waste, sewage sludge cannot be landfilled without a landfill permit modification. Each sludge source must obtain a separate modification approval. The application for a permit modification must include an analysis of alternatives to landfilling, and an explanation of why disposal at a landfill is being proposed.

Acceptance of sewage sludge imposes additional costs upon the landfill, including the costs of administering the permit modifications, and the extra handling effort on the part of the equipment operators. Landfills are limited by how much dewatered sewage sludge they can accept as a percentage of their daily intake of waste. For many Adams County wastewater treatment plants, landfilling would involve the added costs of installing and operating dewatering systems. Recent proposals received from landfills during the RFP process quoted ceiling tipping fees for landfill disposal of dewatered sludge ranging from \$85 to \$141 per ton over the time period of the contracts.

5.5.1.3 Incineration

Incineration of sludge is a two-step process, consisting of sludge drying followed by combustion. Incineration of sludge with refuse has not proven to be viable. Sludge incineration is an expensive process that requires a net energy input. A benefit of incinerating sludge is that the ash residue is organically stable and free of pathogens. Environmental concerns related to incineration, and the associated ash landfilling, include air emissions from the incinerator and potential contamination of groundwater with leachate produced by the ash residue in the landfill. The ash can contain high concentrations of heavy metals. No municipal wastewater treatment plant in Adams County is currently incinerating sewage sludge, and the costs and environmental considerations make this option unfeasible.

5.5.1.4 Composting

Wastewater sludge can be composted, alone or with other wastes, into an organically stable humus material that is useful as a soil amendment. Some essential factors for successful composting are moisture content, material structure, energy (carbon) content, nutrient content, and aeration. The moisture content can be modified, in part, by dewatering the sludge prior to composting. A "bulking agent" such as sawdust, woodchips, leaves, shredded paper, shredded tires, mixed municipal refuse, or finished compost, is added to provide porosity for aeration. Most of the bulking agents identified above reduce the moisture content, and some may be added for their energy content as well as for their moisture-reducing and bulking properties. Aeration is provided by one or both of the following methods: (1) agitation of the material by mixing and turning the pile, and (2) forced aeration by blowers connected to a network of perforated pipes.

Composting is a technologically proven method of sewage sludge handling. However, it is usually more costly than land application (and sometimes landfilling), and therefore is difficult to implement, unless a large quantity of sewage sludge is processed daily. This is not typically the case in Adams County.

Methods - The four general types of composting methods are agitated bed (agitated trough) in-vessel systems, non-agitated in-vessel systems, aerated static pile systems, and windrow systems.

In the **windrow** method, the mixture is formed into long piles having a triangular cross section. The windrows are maintained in an aerobic condition by mixing and turning the piles. This method is not typically appropriate for sludge composting in this part of the country due to its cooler, wetter climate. Contaminated rainwater must be collected and treated, or the entire windrow area must be enclosed.

The **aerated static pile** method involves placing the sludge/bulking agent mixture over perforated piping. The piping system is connected to an air blower that draws air through the pile, thus maintaining aerobic conditions, and removing excess heat and moisture. This system requires the more rigid types of bulking agent to provide the necessary porosity. Odors are controlled by treating the exhaust air. The aerated static pile method is a commonly used sludge composting method in the United States. However, it is difficult to maintain proper process control, and elevated temperatures with this method, to properly

stabilize and compost the piles. For this reason, this method is not commonly employed in new sludge composting systems.

The **non-agitated in-vessel** system involves the non-agitated movement of the composting mixture within horizontal or vertical enclosed reactors. The material decomposes as it travels through the reactor. Aeration is provided by blower systems. This system is moderately capital-intensive.

The **agitated bed in-vessel** system involves turning the compost mixture daily or weekly using a rotomixer or other mechanical device. This approach allows for the use of a wide variety of bulking agents including leaf waste, shredded paper and shredded refuse. The agitated bed also enables more effective process control, and results in a more homogeneous compost product. This system is moderately capital-intensive.

5.5.1.5 Vermicomposting

Vermicomposting is a unique variation of composting, where worms are used to help decompose and stabilize sludge. The process requires a pre-composting step, to stabilize the feedstock, and a homogenization step, to properly mix and size-reduce the feedstock for processing by the worm colonies. The vermicomposting operation must be located in a climate-controlled building, and can be sensitive to minor environmental fluctuations in operating parameters. For this reason, the process requires a relatively large amount of operator control and attention. If properly operated, vermicomposting can produce a finished product with very high market value (some of the product can be worth up to \$200-300 per ton).

5.5.1.6 Shared Sludge Equipment for Hauling to Distant Disposal Sites

Shared hauling of dewatered sludge cake to more distant disposal sites can potentially be done in one of two ways: 1) provide specialized pumping trucks to collect and transport sewage sludge to a central treatment plant for treatment and/or dewatering, with hauling to a disposal site, or; 2) place rolloff containers at each participating treatment plant for temporary storage of dewatered sludge, and use a common service/hook truck to pick up and haul the loads to a landfill when the rolloff is full. By locating a rolloff at each participating treatment plant, service can be geared to each treatment plant's own schedule and individual disposal needs. Treatment plants are also not restricted to emptying the rolloff at the end of the working day. Both of these options require facilities for dewatering sludge at the treatment plant or plants.

5.5.2 Evaluation of Sewage Sludge Processing and Disposal Alternatives

In general, the treatment plants that produce sewage sludge in liquid form land-apply that material, and intend to continue to do so for at least the next 5-10 years. Based on considerations of cost alone, land application is the most attractive sludge management alternative. However, as noted in Section 5.5.1.1, Pennsylvania could adopt a phosphorus-based nutrient management system. If this system is adopted in Pennsylvania, Adams County will need to verify that sufficient land will still be available in the County to handle the continued and safe application of sewage sludge. The current system of land application of liquid sewage sludge and septage is expected to be the continued preferred management method, unless land disposal is no longer an option.

Treatment plants that currently landfill dewatered sewage sludge also intend to continue these practices for the next 5-10 years. The County's designated landfill disposal sites indicated a willingness to accept

dewatered sewage sludge for disposal at their sites. This is expected to continue to be an available disposal option for dewatered sewage sludge through the planning period.

Treatment plants that take their liquid sewage sludge to other wastewater treatment plants for treatment intend to continue these practices for the next 5-10 years, or until regulations change, or a more efficient disposal method is available. However, plants may decide to no longer accept sewage sludge or septage from other plants, and this could create a disposal problem for these generators.

5.5.3 Management Alternatives

Local municipalities and authorities, as appropriate, maintain control over the wastewater treatment plant management, as well as transportation and disposal of sewage sludge. The County may be able to assist in public education, and also help provide for disposal of the sludge through provisions in disposal contracts with designated disposal facilities that accept this waste. Assistance can also be provided to the municipalities for septage management, primarily through education, and also in implementing sewage management programs and coordination of the utilization of municipal treatment plants.

5.6 SPECIAL RESIDENTIAL WASTE

All municipal waste streams contain materials that are undesirable at landfills, incinerators, and composting facilities. These unwanted materials should be removed or reduced to the greatest extent possible to minimize the impact on a waste disposal or processing facility. This section describes household hazardous waste (HHW).

5.6.1 Household Hazardous Waste

Household hazardous waste (HHW) includes such items as paints, pesticides and herbicides, drain cleaners, pool chemicals, solvents and cleaning products, and similar items. While these products are exempted from regulation as hazardous wastes, and may be disposed with other municipal waste generated in the home, they can present hazards for homeowners and waste collectors, particularly if the materials leak from their packaging. Such wastes pose potential environmental risks after their disposal at waste processing facilities and landfills.

Pennsylvania encourages counties and municipalities to establish collection programs to manage this waste for recycling and/or disposal. Act 101 requires that resource recovery facilities develop a program for the removal "to the greatest extent practicable" of hazardous materials from the waste to be incinerated. McSherrystown Borough participates in York County's HHW program through its disposal contract with the York County Solid Waste Authority. Act 101 also created a HHW collection and disposal grant program. However, it only covers 50% of eligible costs, providing for reimbursement of program costs (municipalities must pay for the costs of the HHW upfront, and wait for reimbursement.) PADEP has also developed guidelines for household hazardous waste collection programs.

Growing numbers of communities and counties in Pennsylvania, and beyond, are setting up household hazardous collection events. State grants can partially offset program costs. Waste Collection Drop-off Events, or curbside collections, can be organized (when sufficient funding is available) and scheduled with the assistance of PADEP and disposal companies.

Another HHW collection option is to set up a permanent collection facility. The benefit of this method of removing HHW from the waste stream is that, with the 90-day storage capacity allowed by PADEP, arrangements can be made for the materials to be reused or recycled. Much of the cost involved in HHW handling is due to the transportation of the material to an approved hazardous waste incinerator/landfill. By reducing the amount of HHW to be disposed of, the cost of managing the materials goes down. For example, usable paint can be separated out and used for graffiti removal, used by nonprofit organizations such as theater, art or neighborhood betterment groups, and even bulked and reprocessed as primer paint. A permanent facility is probably more appropriate for an urbanized or more populated county, or where removing these materials from the waste stream yields a direct benefit by reducing air emissions, from a waste-to-energy plant, for example.

A first step in dealing with HHW is educating the public on proper handling and disposal of these products, as well as identifying non-toxic alternative products that can be used. Adams County will continue to play a role in assisting individuals or municipalities on HHW education and proper handling procedures.

Household hazardous waste collection events have been a successful method of HHW collection in many counties throughout Pennsylvania. It is recommended that the County consider annual HHW collection events to serve as a disposal option for this component of the waste stream, if sufficient funding is made available. If annual collection events are held, they should be at a central location, or collected in a curbside program. Limited funding is available through Act 155 of 1994, The Household Hazardous Waste Funding Act, which reimburses municipalities for 50 percent of the eligible developmental and operational costs associated with HHW collection programs. Drawbacks to County participation under the HHW Act are the requirement for a 50 percent match, the upfront payment for the costs of such a program, and the wait for reimbursement.

5.7 SELECTED MUNICIPAL WASTE MANAGEMENT SYSTEM

5.7.1 Overview of Selected Waste Management System

This Plan recommends that Adams County municipal waste be delivered to any of the designated disposal and processing facilities listed in this Plan. The Plan does not guarantee specific amounts of waste to any of the facilities. It is the intent of this Plan to maintain, and expand, on the concept of securing disposal and processing capacity with multiple facilities, and continuing to direct registered transporters to the designated facilities for managing the municipal waste they collect. The County has elected to send municipal waste to disposal and processing facilities designated in this Plan, while incorporating flexibility to facilitate the addition of new facilities when it is to the benefit of the County, individual municipalities, haulers, businesses, and/or institutions in the County. The main reasons for maintaining a system of designated disposal and processing sites are:

- The County is responsible for managing the safe disposal of its municipal waste. The system described in this Plan helps ensure that municipal waste generated in Adams County will be delivered to facilities that are legally permitted and contracted with Adams County.
- The disposal facility contracts are structured with no “put-or-pay” waste delivery guaranteed to any site. This structure allows transporters maximum flexibility in selecting a disposal site that best fits their needs and economics.

The process used to solicit interested disposal and processing facilities ensures that all facilities located anywhere in the United States have an opportunity to be included. The process used to solicit disposal

and processing sites was fair, open, and competitive. Additional disposal and processing sites can petition to be added to the Plan in the future.

The reasons for recommending implementation of the selected system of waste management are as follows:

- **Meets Public Goals** — This recommended system was selected on its technical, economical, environmental, and long-term merits. It meets the requirements of Act 101 to provide for disposal capacity, to January 1, 2029; and to propose a system that continues to meet the long-term goal of exceeding a 35% recycling and waste reduction rate for Adams County.
- **Cost-Effectiveness** — Haulers can select from a list of designated disposal and processing facilities. Haulers will have the option of selecting the designated disposal and processing facility that offers the best opportunity to meet their individual needs to deliver MSW collected from County sources.
- **System Flexibility** — The County has not committed specific amounts of waste to any of the disposal and processing facilities designated in this Plan. Therefore, if a County hauler, municipality, or business can secure a more competitive tipping fee at a facility other than those designated, additional facilities can be added as opportunities arise. Having a number of facilities available results in competition that helps minimize costs.
- **Adequate Disposal Capacity** — The system has more than adequate capacity to manage all municipal waste and recyclables generated in Adams County. There is no need to seek additional facilities, or consider other management options, unless a petition to add a disposal site is received by the County, or unless the County chooses to further pursue another waste management option.

5.7.2 Collection

Under Act 101, it is the responsibility of each municipality to ensure proper collection of municipal waste generated in their municipality. Section 5.2 of this Chapter discusses collection alternatives available to municipalities. Adams County currently uses a combination of municipally-contracted and private subscription waste collection services to serve residents and businesses throughout the County. The current system appears to provide adequate services to its customers. Often, municipal bidding for waste collection services results in a reduction of costs to the homeowner in comparison to private subscription service. Municipalities may want to consider this option, or further, multi-municipal bidding for waste collection services.

5.7.3 Transportation

Under Act 101, it is the responsibility of each municipality to ensure proper transportation of municipal waste generated in their municipality. Section 5.3 discusses transportation alternatives available to municipalities. Under this Plan, all municipal waste generated within the County must be transported to a County-contracted disposal or processing facility by a registered County transporter.

5.7.4 Waste Reduction and Recycling

The County's recommended plan for increasing recycling, and supporting yard waste composting, can be found in Chapter 4. Chapter 4 of the Plan contains further details of recycling opportunities that are available to the residents and businesses of Adams County.

Clearly, the most preferable waste management method is waste reduction, also known as source reduction. Purchasing reusable rather than disposable products, purchasing items in bulk, and selling or donating unwanted items are ways that households can reduce the amount of material they discard. Offices can reduce the amount of waste generated by printing on both sides of the paper, and reusing paper as scrap paper and memo pads.

Waste reduction can be promoted by education, and encouraged by financial incentives. A good example of a financial incentive for waste reduction is quantity-based garbage collection fees (pay-as-you-throw).

The principle of a quantity-based fee is simple: when waste generators must pay more to throw away more, they have a financial incentive to recycle, and otherwise reduce the amount of waste generated. Another advantage of a quantity-based fee is its greater equity. Under a flat rate system, those who discard less than the average are, in effect, subsidizing those who discard more than the average.

Quantity-based fees can have unwanted side effects. Illegal dumping, increased burning of waste, disposing waste in private dumpsters, adding to the waste of a friend or relative in another municipality, and attempted disposal of non-recyclable material as recyclables are all likely to become more common under a quantity-based fee system. A fee schedule with a base number of containers, and an additional cost for each additional container, may mitigate some of these effects. It is important that a quantity-based fee is accompanied by opportunities to substantially reduce the amount of trash disposed, supported by a thorough educational effort explaining the system and the available source reduction and recycling opportunities.

To encourage recycling, Gettysburg Borough and Conewago Township limit the number of waste containers (three) their residents can place at the curb each week.

Additionally, under the jointly bid municipal contract there is a provision for a tag-a-bag service specifically for those residents who may generate less waste.

The waste reduction roles of the County include educating and providing informational assistance to municipal officials, residents, businesses and institutions, and minimizing the waste generated by the County's activities. The County has taken a leadership role in these areas.

5.7.5 Municipal Solid Waste Disposal Facilities

5.7.5.1 Overview

Contracts with multiple designated landfill disposal sites, plus the York County Resource Recovery Center, provide for long-term disposal capacity for Adams County wastes during the next planning period.

Adams County's municipal solid waste will be permitted for delivery to designated facilities listed in Chapter 6 of this Plan (this list will be updated as needed). Having multiple facilities available promotes

competition that will help to keep the system cost-effective. Having several facilities should also promote efficiency by giving haulers the option of using the closest facility.

5.7.5.2 Selection of Designated Facilities

Section 6.2 provides a listing of Designated Facilities.

5.7.5.3 Designated Facilities

Table 5-2 provides a synopsis of the Plan’s designated facilities, along with the capacity that has been made available for Adams County’s waste disposal needs. As Table 5-2 shows, the total capacity that will be available to Adams County through executed agreements with the designated landfills is sufficient for the projected capacity required for Adams County over the 10-year planning period, to January 1, 2029.

The York County Resource Recovery Center has an agreement with Adams County to accept MSW from municipalities without agreements on a spot-market basis to the extent of available capacity at the facility. The spot-market disposal fees are established by the York County Solid Waste Authority.

Additional facilities may petition the County at any time to be added to the Plan as a designated disposal and processing facility, in accordance with the *Procedure to Add Facilities to the Plan as Designated Facilities*, (See Section 5.7.5.4 of the Plan).

TABLE 5-2: AVAILABLE WASTE DISPOSAL CAPACITY

WASTE DISPOSAL CAPACITY AVAILABLE TO DESIGNATED ADAMS COUNTY DISPOSAL AND PROCESSING SITES			
DISPOSAL SITES	MSW MAX AVAILABLE CAP. PER DAY, TONS	C/D MAX AVAILABLE CAP. PER DAY, TONS	SEWAGE SLUDGE MAX AVAIL. CAP. PER DAY, TONS
Blue Ridge LF, Franklin Co.	500	250	100
Mountain View Reclamation LF, Franklin Co.	315	58	20
Cumberland County Landfill ⁽¹⁾	250	250	0
York Resource Recovery Center, York Co. ⁽³⁾	Depends on Avail. Processing Capacity	Depends on Avail. Processing Capacity	.
Modern Landfill, York Co. ⁽¹⁾	222	40	3
Total Available Capacity to January 1, 2029 - Landfills ⁽²⁾	1,287	598	123

⁽¹⁾ Donated waste capacity for clean-ups (Modern LF – 100 tons/year and Cumberland LF – 25 tons/year)

⁽²⁾ Adams County is estimated to require 262 tons (before recycling) of daily disposal capacity to January 1, 2029.

⁽³⁾ Adams County executed a disposal agreement with the York Resource Recovery Center to accept MSW from municipalities without agreements on a spot-market basis to the extent of available capacity at the York Facility.

5.7.5.4 Procedure to Add Facilities to the Plan as Designated Facilities

There are other landfills permitted for municipal solid waste disposal that have the potential for serving Adams County. These facilities have the option of being designated in this Plan in the future, if they meet the conditions stated in the “Application Package” document included in Appendices. This document is provided for the specific purpose of adding additional qualified facilities to the Plan. These facilities can petition the County at any time to be added to the Plan.

If a County-registered transporter, municipality, business, or disposal facility desires to have a facility added to the Plan for processing or disposing of Adams County municipal waste, other than those currently under Agreement with the County and designated in this Plan, the procedure described below must be followed to obtain County authorization to include another facility. This procedure can be initiated at any time. The County must be certain that any facility used for the deposition of the County’s waste minimizes the County’s risks by being in full compliance with State and Federal rules and regulations. The following procedure will enable the County to be reasonably assured that County generated waste is being properly managed.

The procedure is as follows:

1. First, a County-registered transporter, municipality, business or disposal facility must petition the County using the one-page form shown in Table 5-3 to have a facility considered for being added to this Plan.
2. After receiving the petition, the County will forward a copy of the Application Package to the facility being requested for inclusion in the Plan.
3. Upon receipt of the completed Application Package from the facility in question, the County will review and respond to the information in the Application Package.
4. If all information is in order and the facility’s submission is determined to meet the qualification criteria, the County will negotiate with the intent of executing a Municipal Solid Waste Disposal Capacity Agreement with the facility.
5. At a convenient and practical time thereafter, the County will then follow the process to add the facility to the Plan.
6. Once the Capacity Agreement is executed for the site, any registered transporter, municipality, or business will be at liberty to use this new facility for disposal of Adams County generated municipal solid waste.

TABLE 14-3: PETITION TO ADD A DISPOSAL/ PROCESSING FACILITY

PETITION FORM TO ADD A DISPOSAL/ PROCESSING FACILITY

Purpose of Petitioning Process – Adams County has, through Municipal Solid Waste Disposal Capacity Agreements, secured a sufficient amount of disposal capacity for all municipal solid waste generated from County sources. However, business opportunities may arise for County-registered transporters or municipalities with disposal/processing facilities, other than those designated in the County’s Municipal Solid Waste Management Plan, that attract the interest of these parties to use another facility. Therefore, the County’s Plan has defined a process by which additional facilities can be added to the Plan. This form is used to notify the County of a party’s interest in using another disposal or processing facility, and provides the County with the necessary information to contact a facility representative to begin the process to qualify the facility as a designated facility in the Plan. Please complete this form and forward to the:

Adams County Office of Planning and Development
670 Old Harrisburg Road
Gettysburg, PA 17325
Attention: Planning Director

Petitioning Party’s Name: _____

Address: _____

Email Address: _____

Phone Number: _____

Facility Name: _____

Contact Person: _____

Email Address: _____

Facility Address: _____

Facility Phone Number: _____

Fax Number: _____

Explanation for Requesting Additional Facility:

5.7.5.5 Open Dumping Considerations

Like in most counties in Pennsylvania, illegal dumping takes place in rural areas of Adams County. While most view illegal dumps as eyesores, they also create significant concerns for public health and safety, property values, and the general quality of life. When they are ignored, these sites often become chronic dumping areas. Preventing illegal dumping will require the County to address factors that contribute to this problem. Cleaning up existing dumps will require cooperation from governmental entities, residents, businesses, haulers, and disposal facilities in the area. In the past, the County has worked in partnership with various groups and volunteers to organize and facilitate the clean-up of illegal dump sites. The County will continue in this role in the future.

Pennsylvania, and counties like Adams, may have more of a problem because of the large number of municipalities that manage residential waste through individual subscription systems. In these municipalities, some residents choose to dump their waste illegally, rather than pay for a hauler to collect their waste and dispose of it properly. However, there are other factors that contribute to the problem. Some haulers will not collect what might be considered construction and demolition waste generated at the residential level as a result of remodeling and similar activities—materials such as drywall, roofing shingles, siding, lumber, bricks, and concrete, even though all designated facilities in this Plan are permitted to accept C&D waste. Many of the illegal dump sites located in Adams County contain such materials. Other difficult-to-dispose-of items such as tires, auto parts, appliances, and furniture also often end up in illegal dumps. Proper disposal of these materials may require hauling them to a disposal facility during operating hours and paying to dispose of them, an inconvenience or expense that some wish to avoid. However, many of the municipal waste collection contracts contain a large item, curbside pick-up, which allows residents to dispose of these items.

The County should continue to investigate options for the safe disposal of small volumes of C&D waste such as those described above, including, but not limited to: requiring waste haulers to be registered with the County; requiring waste haulers to pick up these materials and deliver them to a County-authorized disposal facility as a condition of registration; educating citizens about the availability of safe and legal opportunities to dispose of these materials; educating residents about the option to rent dumpsters or rolloff containers for collection and disposal of wastes created during remodeling projects; arranging for acceptance of this material at one or more of the designated disposal facilities in the Plan Update; publicizing drop-off sites for these materials; and encouraging the enforcement of municipal waste ordinances, as they apply to illegal dumping. A number of waste haulers now offer smaller dumpster sizes from 10-15 cubic yards in size as a more economical option for small projects. Additionally, there are companies that offer “bagsters” – a 3-cubic yard dumpster in a bag.

The County, in partnership with local municipalities, should consider encouraging the expansion of the large item pick-up program, as a more cost-effective way to encourage proper waste disposal and discourage open dumping.

5.7.6 Selected Sewage Sludge Management System

Section 5.5 concluded that the most common method of liquid sludge disposal, land application, employed almost exclusively by most of Adams County’s municipal treatment plants, and also by septage haulers (either directly by facilities or indirectly through the use of out-of-County facilities), continues to be a preferred method by those plants and haulers. It is expected that this activity will continue, until regulatory changes in the land application programs for sewage sludge or septage (from a nitrogen-based to a phosphorus-based loading system) occur. It is difficult to gauge the impact of such a regulatory change at this point, but it is believed that this may create a significant reduction of the amount of sewage sludge

that can be applied on some sites. This could substantially increase the competition and cost for sewage sludge disposal at land-application sites, result in a loss of disposal options for some sewage sludge, and create a regulatory or economic environment where alternatives to land application may become more imperative and cost-competitive. Reliance on land application will need to be further assessed, if the State's land application regulations change to phosphorus-based nutrient management limits. Another evolving consideration is meeting the Chesapeake Bay Watershed Implementation Plan for nutrient reductions regarding nitrogen. This too may impact land application viability in the future.

For the dewatered sewage sludge generated in Adams County, this Plan Update proposes the continuance of landfill disposal. Adams County has executed disposal contracts with several designated landfill disposal sites that have indicated a willingness to accept dewatered sewage sludge cake.

5.7.7 Construction and Demolition Waste Management

Much of the construction and demolition (C&D) waste generated in Adams County is either recycled, or disposed of, at the Blue Ridge Landfill, Mountain View Reclamation Landfill, Modern Landfill, Cumberland County Landfill, or YCRRRC. According to PADEP Waste Destination reports, 9,140 tons of C&D waste originating in Adams County was disposed at State-permitted disposal facilities in 2017. Disposal options for C&D waste are recycling or disposal at permitted municipal and C&D waste landfills. Provision for the disposal of C&D waste is included in the County's disposal capacity agreements, with all of the designated landfill disposal sites that are under contract with the County. Considerations regarding the open dumping of C&D wastes are discussed in Section 5.7.5.4 of this Chapter.

5.7.8 Household Hazardous Waste

The County will continue to monitor and evaluate the management of HHW to determine its overall impact on future of the County's long-term Solid Waste Management Program.

5.7.9 Infectious and Chemotherapeutic Waste

The system for managing infectious and chemotherapeutic waste generated in hospitals, nursing homes, and other medical facilities, which is managed solely by the private sector, is adequate for handling this material. The County will continue to rely on this system, and is not considering other options for this 10-year planning period. The County will be open to any other cost-effective suggestions that become available.

CHAPTER 6 | LOCATION OF FACILITIES AND PROGRAMS

6.1 INTRODUCTION

Chapter 4 examined the options for collecting and processing source separated recyclable materials and yard waste. Chapter 5 evaluated the various options available for the collection, transportation, processing, and disposal of municipal waste. Chapter 6 identifies the physical location of these processing and disposal facilities.

6.2 WASTE DISPOSAL SITES

Municipal waste generated within Adams County will be disposed at the identified designated disposal facilities listed in this Plan for the planning period through January 1, 2029. The term of agreement for designated disposal facilities will be ten (10) years.

Municipal waste generated in Adams County will be disposed of at the following designated facilities:

- Community Refuse Services, LLC.
d/b/a Cumberland County Landfill
620 Newville Road
Newburg, PA 17240
(Cumberland County)
Note: Agreement extends until January 1, 2029
- Mountain View Reclamation Landfill, Inc.
9446 Letzburg Road
Greencastle, PA 17225
(Franklin County)
Note: Agreement extends until January 1, 2029
- Blue Ridge Landfill Corp.
1660 Orchard Road
P.O. Box 399
Scotland, PA 17254
(Franklin County)
Note: Agreement extends until January 1, 2029
- York County Resource Recovery Center
2651 Black Bridge Rd.
York, PA 17406
(York County)
Note: Agreement extends until March 31, 2024 (and at that time, unless notified otherwise will automatically continue an additional 10-year period)

Note: Agreement depends on available capacity (“spot market”)
- Modern Landfill
4400 Mt. Pisgah Road
R.D. 9, Box 317
York, PA 17402
(York County)
Note: Agreement extends until January 1, 2029

The location of the designated disposal facilities for municipal waste generated in Adams County are presented in Figure 3.1. The County does not guarantee municipal waste to any one of these facilities. It is the option of the municipality, or waste hauler, to dispose of municipal waste at any one of these designated facilities. The designated facilities provided the County with a not-to-exceed tipping fee for municipal solid waste (including C&D and Sewage Sludge waste disposal).

The Hanover Area Transfer Station, the Washington Township Transfer Station, and the Diller Transfer Station are three out-of-County transfer facilities that receive and transfer waste generated by Adams County residents. The Neiderer Sanitation Transfer Station is the only in-County transfer facility. All of these facilities have signed agreements with Adams County to dispose of Adams County generated waste at one of the designated facilities listed in this Plan.

The York County Solid Waste Authority (YCSWA) has an existing, separate, long-term Disposal Agreement with McSherrystown Borough. Additionally, the YCSWA also provides “spot-market” capacity through a contractual arrangement with Adams County for Adams County haulers, if disposal capacity is available at the York County Resource Recovery Center.

Additional facilities may be added to the Plan, at any time, after completing the Application Package for disposal and processing of MSW, according to the procedures for adding facilities to the Plan as described in Chapter 5. Facilities completing the Application Package must meet the same minimum qualifying criteria used for the designated facilities listed in this Plan.

Additional information pertaining to facility contracts and agreements are included in the Appendices.

6.3 SEWAGE SLUDGE AND SEPTAGE PROCESSING/DISPOSAL

6.3.1 WWTP Sewage Sludge

Tables 1-8 and 1-10 list municipal and non-municipal wastewater treatment plants (WWTP’s) in the County that generate sewage sludge requiring disposal. Table 2-3 describes sludge disposal practices, and identifies the methods of sludge disposal for each municipal treatment facility. Disposal methods include land application on approved farm fields, and disposal at Modern Landfill, Capital Region Water, Derry Township Wastewater Treatment Plant, Peck’s Processing Plant, Dover Waste Treatment Plant, Manheim Borough Township Wastewater Treatment Plant, Mountain View Reclamation Landfill, Smith’s Disposal Facility, Springettsbury Wastewater Treatment Plant, and Synagro (land application sites). For the planning period, it is expected that facilities utilizing land application may continue this practice, in accordance with current regulatory requirements and siting criteria, unless competition with out-of-County biosolids sources and/or recently proposed regulatory requirements related to phosphorus and nitrogen loading make land application an unfeasible, or costly, disposal alternative.

6.3.2 Septage

A majority of the septage generated in the County is disposed of at out-of-County land application sites and wastewater treatment plants in Lancaster County, Cumberland County, York County, Franklin County, and Dauphin County. None of the in-County WWTP’s reportedly accept, or process, septage from haulers of County generated septage.

The following is a list of known Sewage and Septage haulers serving Adams County, as reported through 2015 and 2018 surveys:

Advanced Septic Service

65 Richard Lane
Landisburg, PA 17040

Associated Products Services

2 East Road
P.O. Box 231
Mechanicsburg, PA 17050

Busser Septic Service

2048 Jug Road
Dover, PA 17315

Chamberlain & Wingert Sanitary Services, LLC

4776 Philadelphia Avenue
Chambersburg, PA 17201

Dale Miller & Son Inc

217 Mill Street
Fawn Grove, PA 17321

Dillsburg Excavating & Septic Service

516 Range End Road
Dillsburg, PA 17019

D. E. W. & Sons Septic Service

414 Roxbury Road
Newville, PA 17241

Herrick Septic & Excavating

1685 White Hall Road
Littlestown, PA 17340

Kline's Services, Inc.

5 Holland Street
Salunga, PA 17538

Knaper's Stop & Go

955-A Keller Road
York, PA 17406

Mathena Septic Services

2530 Ebbvale Road
Manchester, MD 21102

Olinger's Paving, LLC

280 Hickory Road
Littlestown, PA 17340

Peck's Septic Service

68 Pine School Road
Gardners, PA 17324

Premier Property Services

279 Hostetter Avenue
Shippensburg, PA 17257

Richard Weidner Paving & Excavation

1495 Carlisle Road
Aspers, PA 17304

Superior Septic Services Inc

DBA Rosenberry's Septic Tank Service

8885 Pineville Road
Shippensburg, PA 17257

Ross Excavating & Septic

633 Hobart Road
Hanover, PA 17331

Rosy's Wastewater Removal

8058 Huber Road
St. Thomas, PA 17252

Shealer's Septic Service

510 Hunterstown Road
Gettysburg, PA 17325

Smith's Sanitary Septic Service

1234 Baltimore Street, Rear
Hanover, PA 17331

Sunday's Septic Service

2470 Conewago Road
Dover, PA 17315

Walters Environmental Services, Inc.

9554 Allentown Blvd
PO Box 400
Grantville, PA 17028

Young's Sanitary Septic Service Inc

330 Kralltown Road
Wellsville, PA 17365

Septage is reportedly accepted for processing at the following WWTP's and land application sites as reported through 2015 and 2018 surveys:

- Chamberlain & Wingert Processing/Land Application Site
- Capital Region Water
- Synagro Land Application Sites
- Kline's Services Processing
- Newburg Processing/Land Application Site
- Smith's Septic Service Processing/Land Application Site
- Derry Township Wastewater Treatment Plant
- Lemoyne Sewage Treatment Plant
- Lehigh Wastewater Treatment Plant
- Manheim Wastewater Treatment Plant
- Peck's Processing/Land Application Site
- Springettsbury Township Wastewater Treatment Plant
- Leatherman Land Application Site
- Dover Waste Treatment Plant
- Norristown Wastewater Treatment Plant
- Walter's Ag Facility in Grantville
- Young's Sanitary Septic Services Processing
- Mark Richard Farm Landisburg Land Application Site

It is expected that Adams County septage haulers may continue to haul to the identified WWTP's and land application sites during the planning period, unless 1) treatment plants choose not to continue to accept septage, or 2) regulatory requirements related to phosphorus and nitrogen loading make land application an unfeasible, or costly, disposal alternative.

6.4 LOCATION OF RECYCLABLES COLLECTION PROGRAMS

6.4.1 Act 101 Mandatory Curbside Recycling Collection

Municipalities that currently include programs for collection of recyclable materials include (Figure 4-1):

- The Borough of Gettysburg (contracted with private collector)
- Conewago Township (contracted with private collector)
- Oxford Township (contracted with private collector)

Contractual Curbside Recycling Programs - part of a joint municipal collection contract agreement (service is not mandatory for residents)

- Abbottstown Borough
- Arendtsville Borough
- Bendersville Borough
- Biglerville Borough
- Butler Township
- Carroll Valley Borough
- Cumberland Township
- East Berlin Borough
- Fairfield Borough
- Franklin Township

- Freedom Township
- Hamiltonban Township
- Highland Township
- Huntington Township
- Latimore Township
- Liberty Township
- Menallan Township
- Straban Township
- Tyrone Township
- York Springs Borough

Refer to Figure 4-1 for locations of Contractual Curbside Recycling Programs in Adams County.

McSherrystown Borough contracts separately for its curbside program, as do several private communities.

Residents in many other municipalities have the option to subscribe for recycling services through individual service contracts (See Waste Services Information).

Adams Rescue Mission - The Adams Rescue Mission discontinued free curbside recycling services to Adams County residents in 2018. This was a cost-saving move necessitated by a downturn in recycling commodity prices and reduced market accessibility.

The Mission does however, continue to collect recyclables from area businesses, and accepts recyclables brought to their facility by community members.

Curbside Recycling Services - Curbside collection of recyclables is offered under all of the jointly bid waste contracts as an integral service, or as an additional service (for an additional cost). Additionally, many residents in municipalities that do not bid waste contracts also have the option to include recyclables services, along with municipal waste collection, for an additional fee through private subscription service. (See Waste Services Information).

6.4.2 Drop-off Recycling Sites

Locations of voluntary drop-off recycling sites are presented in Figure 4-1.

- Berwick Township Building
- Cumberland Township Building
- Latimore Township Building
- Oxford Township Building
- Neiderer Sanitation Transfer Station
- Reading Township Building
- Adams Rescue Mission, Straban Township

6.4.3 Yard Waste

Please refer to Section 4.8.6, Adams County Initiatives in Yard Waste Management.

CHAPTER 7 | IMPLEMENTATION

7.1 IMPLEMENTING ENTITY

The County planning options and initiatives are designed to provide Adams County the flexibility to assure the successful implementation of this Plan. This Chapter identifies the agency responsible for the implementation of the Plan, and the essential tasks required to implement the Plan. This Chapter lists the proposed planning initiatives for the County, possible methods of funding these initiatives, and schedule for implementation. This Chapter also discusses public participation process used in developing the Plan.

7.1.1 Adams County As Implementing Agency For The Plan

The Adams County Board of Commissioners, through the Adams County Office of Planning and Development, is the implementing entity for the Adams County 2019 Plan Update.

7.2 PLANNING INITIATIVES

The County may elect to pursue the following planning initiatives, as identified during the Plan Update process:

- Continue to leverage private partnership opportunities and grants, as Adams County has no direct source of funding to support planning initiatives. If feasible, future opportunities could include enhanced recycling education, additional recycling drop-off programs, additional yard waste composting options, illegal dumping clean-up programs, household hazardous waste collections, and other such services that benefit County residents.
- Consider expansion of additional curbside recyclables collection programs within the County, and/or special handling waste collections (e.g. bulky item collection, covered device recycling, etc.) through municipal waste collection contracts.
- Work to improve the public education component of recycling programs, and solid waste management programs/services, through various forms of media (e.g. newsletters, brochures, websites, news articles, etc.).
- Promote adoption of a model litter ordinance on the municipal level.
- Implement a litter control program to reduce open/illegal dumping by increasing public awareness of existing disposal alternatives, implementing enforcement actions, and participating in cleanup activities.
- Support school and other public education programs, and assist in identifying possible funding sources for these programs.
- Review the status of the Adams County Chesapeake Bay Watershed Implementation Plan on a periodic basis, and assess whether further measures by the County are necessary to assist in dealing with changes in the regulatory situation for land application of sewage sludge.
- Review the County Municipal Solid Waste Management Plan on an annual basis to determine if planned programs for implementation are being addressed.

7.3 POSSIBLE RESOURCES FOR IMPLEMENTATION

7.3.1 Resources for Planning Initiatives

State funding, in the form of Act 101, Section 901 Planning Grants, is available and can be used to offset up to 80 percent of the cost for many planning initiatives, including development of education programs, recycling activities, and feasibility studies for further consideration of each initiative. Act 101, Section 902 Grants provide up to 90 percent of the cost of implementing recycling and similar programs (including engineering, procurement of equipment and materials, construction, etc.).

The PA Household and Small Business Pollution Prevention Act, Act 190 provides funding for various initiatives such as tire recycling and household hazardous waste collection.

The Keep PA Beautiful Program offers resources for various efforts related to illegal dumping and litter abatement.

Several of Adams County's contracted disposal facilities offer free disposal capacity for community cleanup initiatives.

Community volunteer service opportunities are available through various organizations in the County.

7.4 PUBLIC FUNCTION, ORDERLY EXTENSION AND NON-INTERFERENCE

7.4.1 Public Function

Adams County has determined that it is in the public interest for planning for municipal waste management to be a public function. Currently, Adams County does not own, or operate, any municipal waste disposal facilities.

7.4.2 Orderly Extension

This Plan has been developed in accordance with current Federal, State, and local laws and regulations, and updated to provide for the orderly extension of municipal waste management programs in a manner that is consistent with the needs of Adams County. This Plan builds upon the County's existing waste management system, as described in prior Plans. .

7.4.3 Non-Interference with Facilities Developed Pursuant to Sub-County Plans

As required by Act 101, the Adams County Municipal Solid Waste Management Plan will not affect the design, construction, operation, financing, or contractual obligations of any municipal waste landfill, processing facility, or resource recovery facility, located within the County. There are no landfills or

resource recovery facilities within Adams County, and there is only one processing facility. This Plan meets the non-interference requirements established by Act 101.

There are no sub-County plans in Adams County; therefore, there are no conflicting plans.

7.5 IMPLEMENTING DOCUMENTS

The institutional framework for implementing the County Plan is formed by the County Resolution, PADEP approval of the Plan, and Other Plan Implementation Documents.

7.6 IMPLEMENTATION SCHEDULE

Table 7-1 presents the implementation schedule for the tasks/functions related to the implementation of this Municipal Solid Waste Management Plan Update.

7.7 PUBLIC PARTICIPATION

The County Municipal Solid Waste Management Plan revision process was conducted in the appropriate public forum. Public notifications of the Plan revision process were sent to PADEP, all County municipalities, and the County Solid Waste Advisory Committee (SWAC). These notifications advised all parties of the intention of the County to conduct a Plan Update. The planning process has followed the requirement of 25 PA Code Chapter 272 of the PADEP Rules and Regulations.

In order to provide for public participation in the planning efforts related to this Plan, the Adams County Commissioners appointed the Solid Waste Advisory Committee (SWAC) in 2011. The SWAC assisted in preparing the Municipal Solid Waste Management Plan for the County by providing input from the citizenry, waste management organizations, selected interest groups, and municipal officials within Adams County. SWAC members met initially on October 13, 2011, and have met throughout the development of this Plan Update.

TABLE 7-15: MUNICIPAL WASTE MANAGEMENT SYSTEM FUNCTIONS AND IMPLEMENTATION SCHEDULE

MUNICIPAL WASTE MANAGEMENT SYSTEM FUNCTIONS AND IMPLEMENTATION SCHEDULE	
TASK OR FUNCTION	DATES
WASTE MANAGEMENT SYSTEM	
Executed Waste Disposal Facility Contract Agreements for Identified RFP and Application Package (Qualified) Respondents	End of 2018, early 2019
PROVIDE FOR ADEQUATE DISPOSAL CAPACITY	By JANUARY 1, 2019
PLAN APPROVAL-PADEP	BY Fall 2019
Allow Qualified Facilities to be Added to the Plan	Continuing
Assess Recycling Initiatives/Goals for Possible Implementation	Continuing
Continued Monitoring, Documenting, and Reporting of Recycling Activities/Performance	Continuing

Refer to Section 7.31 for additional County planning initiatives established as part of this Plan Update process.