Appendix D –Disposal Data

Purpose of Appendix D (remove this text box for the solid waste management plan)

You will project quantities of waste to be disposed (in this appendix) and then use those quantities to calculate generation in Appendix G (i.e. calculate generation using the "disposal plus recycling" methodology). You will do this for residential/commercial waste, industrial waste, and excluded waste. If the quantity of excluded waste disposed in the reference year was less than 10 percent of total generation in that year, then you will have the option of eliminating projections for excluded waste for the solid waste management plan.

You will evaluate the SWMD's historical disposal data over at least the last five years (the reference year and the four preceding years). This evaluation will involve:

- Comparing the waste disposed in each of the five years to identify and trends or inconsistencies
- Comparing the waste that was disposed in the reference year to the waste you projected would be disposed in that year according to the currently approved solid waste management plan.
- Comparing the waste disposed by your SWMD to the waste disposed by other SWMDs and by the state as a whole.

The evaluations are intended to help you understand the factors that affect the quantities of waste disposed, identify any trends or other commonalities that you can use to project waste to be disposed during the planning period, identify any outliers that skew the SWMD's disposal trend, make sure the quantities of waste disposed make sense when benchmarked against other SWMDs, and help you to improve your disposal projections over time.

After evaluating the SWMD's historical data and drawing conclusions from that evaluation, you will determine how to project quantities to be disposed during the planning period. These instructions recommend using either the average per capita disposal rate or the average percentage change over the five years. However, you can use a different projection methodology if neither of the averages accurately reflects disposal in the SWMD.

A. Reference Year Waste Disposed

Instructions for completing Table's D.1, D.2 and D.3 (remove this text box for the solid waste management plan)

Tables D.1, D.2 and D.3 will provide the total amounts of residential/commercial, industrial and excluded waste disposed of in landfills and accepted at transfer facilities in the reference year.

For reference year data, use the ADR Review Form that is published by Ohio EPA [and made available on the SWMD/Planning Page of Ohio EPA's website]. The SWMD can supplement or substitute for Ohio EPA's data using data the SWMD collects on its own or that is available through other sources (e.g. data the SWMD receives from owners or operators of facilities due to designation agreements or contracts.). When supplementing data, provide an explanation as to why Ohio EPA's data was not representative and how the SWMD's data was collected.

Instructions for completing Table D.1 (Reference Year Waste Disposal) – Table D.1 will display all solid waste disposed at each landfill facility by each sector for the reference year. Include all types of landfills used: municipal solid waste landfills, both publicly and privately owned; captive industrial solid waste landfills; and captive residual solid waste landfills.

Complete Table D.1 as follows:

- Enter name of each landfill that reported receiving waste for the SWMD in the reference year [Note: organize facilities by in-district, out-of-district, and out-of-state]
- Enter the type of landfill – use PA, PUB for publicly-available, publicly-owned, PA, PRI for publicly available, privately-owned, and PA for privately available (i.e. a captive facility)
- Enter the county and state where the landfill is located
- Enter the reported quantities of waste received by each sector in the reference year
  [Note 1: Add asbestos to residential/commercial waste.]
  [Note 2: Add C&DD to excluded (formerly known as exempt) waste.]
  [Note 3: All quantities should be reported in tons and rounded to the nearest ton.]
- Add rows as necessary but do not delete existing rows. If not all of the rows provided are needed, then leave the unneeded rows blank. This will reduce the likelihood of invalidating imbedded formulas.

In the space reserved with "[replace with text to explain the entries in Table D.1]" provide any text needed to explain the data in the Table D.1.

Table D.1 Reference Year Waste Disposal

Facility Name	Facility Type	Location		Waste Received from the SWMD (TPY)			
		County	State	Residential/Commercial	Industrial	Excluded	Total
In-district facilities							
Out-of-district facilities							
Out-of-state facilities							
Total Direct Haul Waste Disposed in Landfills							

[replace with text to explain the entries in Table D.1]

Instructions for completing Table D.2 - Reference Year Transferred Waste)
(remove this text box for the solid waste management plan)

Table D.2 will display the transfer facilities that received waste from the SWMD in the reference year for each sector.

Complete Table D.2 as follows:

- Enter the name of each transfer facility that reported receiving waste from the SWMD in the reference year [NOTE: organize facilities by in-district, out-of-district, and out-of-state].
- Enter the type of transfer facility – use PUB for publicly-owned, PRI for privately-owned
- Enter the county and state where the transfer facility is located
- Enter reported quantities of waste received by each sector in the reference year
  [Note 1: Add asbestos to residential/commercial waste.]
  [Note 2: Add C&DD to excluded (formerly known as exempt) waste.]
  [Note 3: All quantities should be reported in tons and rounded to the nearest ton.]
- In the column labeled “Destination”, enter the name(s) of the landfill facilities where the transfer facility sent the waste for disposal (this information is available in Section 11 of the facility annual report for the transfer facility).
- Add rows as necessary but do not delete existing rows. If not all of the rows provided are needed, then leave the unneeded rows blank. This will reduce the likelihood of invalidating imbedded formulas.

In the space reserved with “[replace with text to explain the entries in Table D.2]” provide any text needed to explain the data in Table D.2.

Table D.2: Reference Year Transferred Waste

Facility Name	Facility Type	Location		Waste Received from the SWMD (TPY)				Destination
		County	State	Residential/Commercial	Industrial	Excluded	Total	
In-district facilities								
Out-of-district facilities								
Out-of-state facilities								
Total Transferred Waste								

[replace with text to explain the entries in Table D.2]

Instructions for completing Table D.3 - Reference Year Waste Disposal and Waste Transfer Combined (remove this table for the solid waste management plan)

Table D.3 will combine all direct hauled and transferred waste by each sector to arrive at a total disposal number by sector and a total disposal number for the SWMD. From this point forward, total disposal refers to direct haul plus transferred waste.

For Table D.3:

- All data for Table D.3 will automatically populate after completing Tables D.1 and D.2.
- Formulas embedded into Table D.3 will automatically calculate totals for each sector.
- If excluded waste is less than 10 percent of total waste generated, use Table D.3.c to calculate total waste disposed of in the reference year.

  [NOTE: There is a supplemental table (Table D-3.b) in the worksheet for Table D.3 that will automatically calculate excluded waste as a percentage of total waste generated in the reference year.]

  [NOTE: If excluded waste comprised 10 percent or less of total waste generated in the reference year, then excluded waste will be left out of all further calculations].

In the space reserved with "[replace with text to explain the entries in Table D.3]", provide any text needed to explain the data in Table D.3.

Table D.3: Reference Year Waste Disposal and Waste Transferred Combined

	Residential/ Commerical	Industrial	Excluded	Total
Direct Hauled				
Transferred				
Total				

[replace with text to explain the entries in Table D.3]

B. Historical Waste Analysis

Instructions for completing Table D.4 – Historical Disposal Data (remove this text box for the solid waste management plan)

Table D.4 will provide historical disposal information for the SWMD for the reference year and the four years prior to the reference year (a total of five years). The SWMD will use this data to develop projections for how much waste will be disposed during the planning period. The idea is to analyze this historical data to identify a past trend for waste disposal in the district and use that trend to project disposal. Trends and projection methodologies may vary by sector.

Use data from Table D.3 for the reference year. Use data from the ADR Review Forms published by Ohio EPA for the four years prior to the reference year (the ADR Review Forms are available on the SWMD/Planning Page of Ohio EPA's website). All quantities should be reported in tons and rounded to the nearest ton.

Once Table D.4 is completed, the SWMD will use the data to develop disposal projections for each sector.

Complete Table D.4 as follows:

- Enter the reference year in the highlighted cell. The prior four years will automatically populate.
- Enter the total quantities of waste disposed (direct haul + transferred) for each corresponding year for each sector (i.e. residential/commercial, industrial and excluded) in the appropriate columns. [Note: if the SWMD is not required to account for excluded waste because it comprised 10 percent or less of total waste generated in the reference year, then leave the entire column blank. Please do not delete the column. Leaving the column will reduce the likelihood of invalidating embedded formulas by removing cells.]
- A formula in the table will automatically calculate the per capita disposal rate for the residential/commercial for each year once all data has been entered.

In the space reserved with "[replace with text needed to explain the data in Table D.4]", provide any text that is needed to explain or qualify the data in Table D.4.

Table C-4: Historical Disposal Data

Year	Population	Residential/ Commercial Solid Waste		Industrial Solid Waste	Excluded Waste	Total Waste
		Weight (tons)	Rate (ppd)	Weight (tons)	Weight (tons)	Weight (tons)

[replace with text needed to explain the data in Table D.4]

Instructions for analyzing the data in Table D.4 (remove this text box for the solid waste management plan)

Evaluate the historical disposal data entered in Table D.4 with a focus on identifying trends or other factors that should be considered when making conclusions and projections. The idea is to spend some time thinking about the historical data to fully understand it. This will assist you when developing projections for the planning period. Recommended analyses and discussion points are identified below for residential/ commercial, industrial, and excluded wastes.

1. Residential/Commercial Waste

Calculate

- Determine the average percentage increase/decrease in disposal for the five year time period (i.e. the reference year and the four prior years).

  [NOTE: There is a supplementary table in the worksheet for Table D.4 that will automatically complete this calculation after all of the data is entered into Table D.4.]

- Determine the average per capita generation rate over the five year time period.

  [NOTE: There is a supplementary table in the worksheet for Table D.4 that will automatically complete this calculation after all of the data is entered into Table D.4.]

Analyze:

Analyze the data in Table D.4 to identify a methodology for projecting waste to be disposed during the planning period:

- Analyze the quantities of waste disposed over the last five years.
- Analyze the annual percent change in waste disposed over the five years.

- Analyze the per capita disposal rate over the five years.

Did the quantities of residential/commercial waste disposed, the percentage change in disposal, and the per capita disposal rate increase, decrease, remain constant, or fluctuate inconsistently? Again, the idea is to identify a trend that can be used to project future waste to be disposed.

[NOTE: The worksheet for Table D.4 will automatically create a line graph for the residential/commercial sector using the data from Table D.4. This graph will depict the annual weights and a trend line which may help with identifying a trend.]

Next, compare the quantity of waste disposed in the reference year to the quantity the currently approved solid waste management plan projected would be disposed in that year. If the quantities are significantly different, then try to determine the cause of the difference. Things to consider include:

- Population that increased/decreased faster/slower than projected.
- Quantities of material recovered were less than/more than projected (i.e. less waste generated was recycled and more was disposed than projected or vice versa)
- Commercial activity was less than/more than projected
- Others?

Based on the analyses:

- If there is a clear trend that can be used to project future waste to be disposed (such as a consistent increase or decrease) or if the data fluctuates but the quantities disposed are similar (i.e. there are no outliers), then select the factor you believe to be the most representative to make projections (i.e. the average per capita rate, the average percent change, or another factor the SWMD develops based on its data). This is the factor the SWMD will use to generate the projections in Table D.5.

- If there isn't a clear trend or there is significant variation in the data, then analyze the data further. Things to consider include:
    - Is there is significant variation in the data from one year to the next? If yes, can you determine why?
    - Is there a year that is outlier in the data?
        - If yes, can you identify the cause? Examples:
            - a large ice storm or other natural disaster resulted in more waste disposed in one year than in other years;
            - a new or large commercial entity began generating waste during the five year period;
            - an existing large commercial entity quit generating waste during the five year period;
            - a large quantity of waste that previously was disposed at a landfill located within Ohio was sent to an out-of-state landfill for disposal

and not recorded as originating from within the SWMD.

If you can identify the cause of the outlier, then is it possible to adjust the disposal quantity to correct for the cause? If yes, then enter the adjusted quantity in the appropriate cell and explain the adjustment in the space reserved with "[replace with text to explain the residential/commercial disposal analysis]".

- If you cannot identify the cause or can't adjust the quantity to correct for the cause, then consider eliminating the data for the outlier year from Table D.4 to prevent the outlier from skewing the averages.

- If the SWMD uses a projection factor based on using an average of the data, (either annual percentage change or the annual per capita rate), do the resulting projections make sense given the data for the past five years? As an example, if using the average percentage change or average per capita rate results in disposal projections that are either higher or lower than most of the quantities from the last five years, then using the average may not be appropriate to project disposal. In that situation, the SWMD may need to adjust the factor or develop another factor.

- Would the analysis benefit by including more years in Table D.4 (i.e. more than four years prior to the reference year) to minimize the effects of variation on the averages by analyzing trends over a longer period of time? If yes, then add rows to Table D.4 and enter the data corresponding to the additional years.

Compare/draw conclusions

- Compare the SWMD's disposal trend, per capita disposal rate, and percentage change to those for other similar SWMDs and the statewide average. Are the SWMDs statistics in line with other SWMDs? With Ohio as a whole? If no, why? Factors to consider include:
  - For higher rates, consider factors such as:
    - the presence of a large operation like an auto shredder that disposes of large quantities of waste;
    - seasonal populations such as a university or tourists;
    - the presence of a regional destination hub for residents from other counties (such as a shopping center, a mall, a tourist attraction);
    - mischaracterization of waste (such as industrial waste mischaracterized as residential/commercial waste or waste from other SWMDs being attributed to the SWMD.
  - For lower rates, consider factors such as:
    - Is the SWMD or a county within the SWMD a bedroom community for people who work in other counties?

    - Is there a limited commercial sector?
    - Is mischaracterization of waste occurring (such as waste from the SWMD being attributed to other SWMDs)?
- Is there a correlation between population change and disposal?
- Is there a correlation between commercial activity and disposal (it is natural to see a decrease in disposal if there is declining business activity)? Sources to consult include:

After analyzing the disposal data, then select the factor you believe to be the most representative to use to make projections (i.e. the average per capita rate, the average percentage change, or another factor the SWMD develops based on its data). This is the factor the SWMD will use to generate the projections in Table D.5.

In the space indicated by "[replace with text to explain the residential/commercial disposal analysis]", provide text to explain how the SWMD analyzed the data in Table D.4, conclusions drawn from the analysis, and the factor selected to make projections.

2. Industrial Waste

Calculate:

- Determine the average percentage increase/decrease in disposal for the five year time period (i.e. the reference year and the four prior years).

Adam – add a column to the worksheet to calculate annual percentage change

Analyze:

Analyze the quantities of waste disposed over the last five years and the annual percent change in waste disposed over the last five years to identify a methodology for projecting waste to be disposed during the planning period:

Did the quantities of industrial waste disposed and the percentage change in disposal increase, decrease, remain constant, or fluctuate inconsistently?

[Note: Refer to the instructions for analyzing the residential/commercial waste (beginning on page 6) and, with the exception of the points below, follow the same procedure for analyzing the industrial waste.]

Factors to consider when evaluating variation in industrial disposal data to identify the cause:

- a major new industrial generator began operating or an existing industrial generator ceased operating during the five year period;
- an existing industrial facility completed a major addition, hired additional employees/reduced employees, increased/decreased output;
- a large quantity of industrial waste that was previously disposed at a landfill

located within Ohio was sent to an out-of-state landfill for disposal and not recorded as originating from within the SWMD).

Compare/draw conclusions:

In the space indicated by "[replace with text to explain the industrial generation analysis]" provide text to explain the analysis and any conclusions.

Some things to consider during the analysis include:

- Identify correlations among disposal, employment, and manufacturing output. Is the industrial sector projected to grow or shrink (in terms of output, employment, etc.). Sources to consult include:
  - Information from the Bureau of Labor Market Information
  - Ohio Job Outlook published by the Ohio Department of Job and Family Services
  - Ohio County Indicators published by the Ohio Development Services Agency (for employment trends by county)
  - County Profiles (lists the largest employers in the county)
  - Information from local chambers of commerce
  - Ohio Industry Series published by the Ohio Development Services Agency (provides overviews of specific industries including projected growth, employment trends, number of establishments by county).
  - Information from local trade associations
  - Economic Overview of Ohio published by the Ohio Development Services Agency.
  - The Ohio Manufacturer's Association
- Compare growth or reduction in industrial activity within the SWMD to activity or trends in the SWMD's region of the state and/or to Ohio.
- Are there factors that affect the SWMD's disposal quantities, the composition of industrial waste disposed, or disposal rates? Examples of potential factors include:
  - hosting a large generator, such as automotive plant or foundry;
  - hosting industrial generators that are strongly affected by the economy;
  - hosting an electric utility.

After analyzing the industrial waste disposal data, then select the factor you believe to be the most representative to use to make projections. This is the factor you will use to generate the projections in Table D.5.

In the space reserved with "[replace with text to explain the industrial disposal analysis]", provide text to explain how you analyzed the data in Table D.4, conclusions you drew from the analysis, and the factor you selected to make projections.

3. Excluded Waste [NOTE: These instructions apply to only those SWMDs that are required to account for excluded waste.]

Calculate:

- Determine the average percentage increase/decrease in disposal for the five year time period (the reference year and the four prior years).

  [NOTE: There is a supplemental table in the worksheet for Table D.4 that will automatically complete this calculation after all data is entered in Table D.4]
  Adam – add a column to the worksheet calculate annual percentage change

Analyze:

Analyze the quantities of excluded waste disposed over the last five years and the annual percentage change in disposal to identify a methodology for projecting excluded waste to be disposed during the planning period:

Did the quantities of excluded waste disposed and the percentage change in disposal increase, decrease, remain constant, or fluctuate inconsistently?

[NOTE: While the SWMD ultimately will use the average percent change to project excluded waste to be disposed of during the planning period, it is still important for the SWMD to understand the types of excluded waste generated and the factors that affect how much excluded waste is generated. Therefore, there are instructions below for analyzing the excluded waste.]

Next, compare the quantity of waste disposed in the reference year to the quantity the currently approved solid waste management plan projected would be disposed in that year. If the quantities are significantly different, then try to determine the cause of the difference.

Based on the analyses:

- Identify any factors that influence how much excluded waste is disposed such as: presence of a coal-burning utility; foundries that generate excluded foundry sand; ongoing, large construction activities, etc.
- Identify correlations between changes in the amounts of excluded waste generated and the activities that resulted in those changes. For example, if a large portion of the excluded waste is bottom or fly ash and there was a significant change in the quantities generated, then is there an identifiable cause –such as a new utility began/ceased operating, a utility upgraded its pollution control technology, a utility generated more/less electricity than usual, etc.

In the space indicated by "[replace with text to explain the exclude waste disposal analysis]"provide text to explain how you analyzed the data in Table D.4 and any conclusions you drew from the analysis.

[replace with text to explain the residential/commercial disposal analysis]

[replace with text to explain the industrial disposal analysis]

[replace with text to explain the excluded waste disposal analysis]

C. Disposal Projections

Instructions for completing Table D.5 (remove this text box for the solid waste management plan)

Table D.5 will provide projected quantities of waste to be disposed, per waste type, during the planning period. Conclusions from your historical analysis in Table D.4 will be applied here to calculate these projections.

[NOTE: if the SMWD is not required to account for excluded waste because the amount generated in the reference year was less than 10 percent of total waste generated in the reference year, then leave the column for “Excluded Waste" blank.]

Before completing Table D.5, you should consider whether there are factors that could change the quantities of waste projected to be disposed/the per capita disposal rate. If there are factors that could affect disposal, then you may need to alter the factor you selected to base projections on.

Potential factors to consider include:

- Significant projected population change within a county or within a community located in the SWMD
- Whether any new, significant generators began operating after the reference year or are anticipated to begin operating during the planning period (such as a regional warehouse for a retailer, auto manufacturer, auto shredder, power utility, etc.)
- Whether any existing, significant generators ceased operating after the reference year or are projected to cease operating during the planning period.

Complete Table D.5 as follows:

In the column labeled “Year”, enter the reference year in the first row. All subsequent years will automatically populate.

- All reference year disposal data will automatically populate
- Use your results from analyzing historical data from Table D.4 to calculate future disposal.
- For the year directly after the reference year, enter a formula based on your conclusions into each of the corresponding cells.
- Click the bottom right corner of the cell with the new formula and drag your calculation down to the last year of your planning period.
- If there are less than 16 years in the planning period, leave unused rows blank. Please do not delete unused rows.

Table C-5: Disposal Projections

Year	Residential/ Commercial Solid Waste		Industrial Solid Waste	Excluded Waste	Total Waste
	Weight (tons)	Rate (ppd)	Weight (tons)	Weight (tons)	Weight (tons)
2012	163,040				
2013					
2014					
2015					
2016					
2017					
2018					
2019					
2020					
2021					
2022					
2023					
2024					
2025					
2026					

Sample Calculations

[replace with text to explain your methodology for calculating disposal projections]