Greenhouse Gas Reporting Program

XML Reporting Instructions
for Subpart HH -
Landfills

United States Environmental Protection Agency
Climate Change Division
Washington, DC

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These instructions explain how to report the required data for the applicable regulations. Owners and operators of units should refer to the applicable regulations for information about what data are required to be reported.

EPA has finalized a rule that defers the deadline for reporting data elements used as inputs to emission equations for direct emitters. (See http://www.epa.gov/climatechange/emissions/ notices.html for a pre-publication version of the rule). In accordance with the rule, e-GGRT is not currently collecting data used as inputs to emission equations.

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Introduction

The U.S. Environmental Protection Agency's (EPA's) electronic greenhouse gas reporting tool (e-GGRT) extensible markup language (XML) Reporting Schema contains all of the data elements needed to comply with the greenhouse gas reporting program (GHGRP) beginning with the 2010 data collection year. The schema defines expected data elements and attributes, allowable data types for each element, and the hierarchy and order in which elements must appear. Similar to an architectural blueprint that describes the structural design of a house, an XML schema describes the structural design of an XML file. In some cases, it also defines which elements are optional and which are required, and the maximum number of occurrences allowed for each element.

The e-GGRT XML schema is made up of a root element, complex elements, and simple elements. A simple element is a single piece of data. A complex element is a group of simple elements which are logically grouped together. The root element is the base of the XML schema.

The elements are related to each other in parent-child relationships. The root element is the parent element of the entire schema. Complex elements are children of the root element, and complex elements can also be children of other complex elements. If a complex element is dependent on a parent complex element, the child complex element cannot be included in the XML file unless the appropriate parent complex element is also included.

The XML upload method may be used only for submitting the annual GHG report. User and facility or supplier registration, and the Certificate of Representation, must be entered on-line using e-GGRT.

All XML files submitted to e-GGRT must be well formed and will be accepted only if they conform to the correct and current version of the e-GGRT XML schema.

An XML submission can only contain GHG data for a single facility or supplier. All data for a facility or supplier must be submitted in a single file as a complete report and must include all of the relevant subparts. It is not possible to submit a subset of any portion of a facility's data to add, delete, correct, or update. The entire report must be resubmitted to make any modification at all. Each subsequent submission for the same facility replaces all of the previously submitted data.

The e-GGRT XML schema contains enumerated lists of the units of measures for some data elements and allowable values for some data elements. For rules regarding the unit of measure or allowable values for a specific data element, please refer to the appropriate Data Elements table.

The e-GGRT XML Reporting Schema is available for download at the GHGRP web site here: http://www.epa.gov/climatechange/emissions/e-ggrt_xml.html. The zip file contains:

- **GHG_Final.xsd and Included Files**
- **SchemaChanges.xlsx**

This document provides a step-by-step description of how to report data on the methane generation and emissions from municipal solid waste (MSW) landfills as required by Subpart HH of the Greenhouse Gas Reporting Program (GHGRP) using the XML schema. Please note the following:

- **Not all data elements included in the schema must be reported.** Required or relevant data components and data elements are boxed in red in the schema diagrams and listed in the tables. If a data element is not listed, it does not need to be reported (e.g., deferred data elements, IsConfidentialBusinessInformationIndicator). Some data elements are conditional and only need to be reported if they are relevant to the reporting facility.
- **Enumerations are case sensitive.** Values must be reported exactly as they are displayed in order to be accepted by schema validation.

- **Data elements must be reported in a specific order.** The figures and tables in this document depict the specific order in which data elements must be reported in order to produce a well-formed XML report.
- **Data elements for calculated and measured values are not displayed in the schema diagrams.** The parent elements for calculated and measured values are displayed in the schema diagrams in this document, but the specific data elements to be reported are not displayed. The descriptions in the XML data elements tables include the specific data elements to report, which are commonly the calculated or measured value and the unit of measure. For some values, the number of times substitute data procedures were used may also be required. See Figure 1 for the expanded view of a sample data element which is a calculated value and Figure 2 for the expanded view of a sample data element which is a measured value.

Figure 1
Sample Calculated Value Schema Diagram
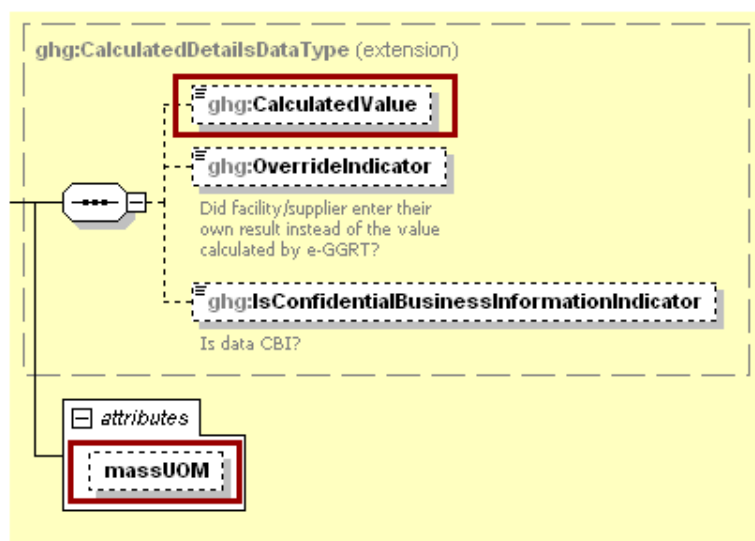
Figure 2
Sample Measured Value Schema Diagram
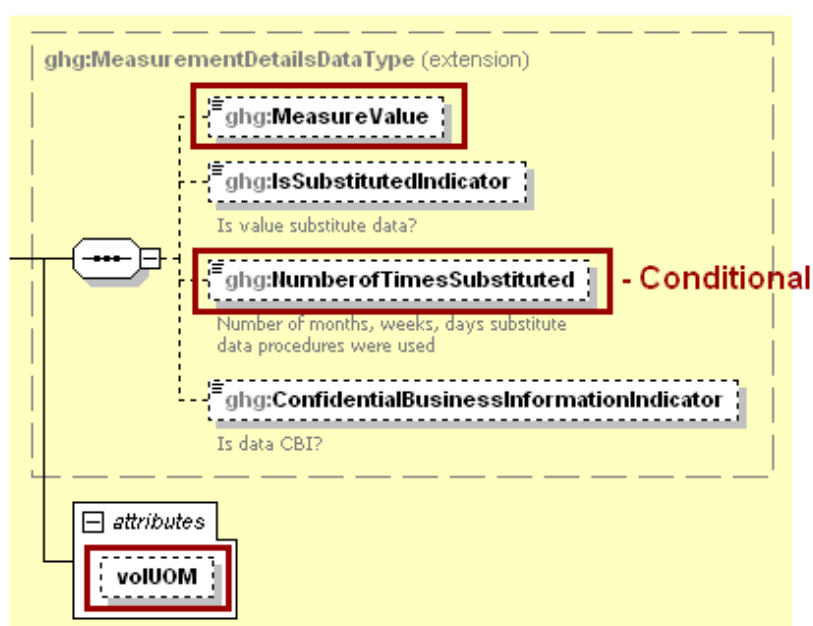
Figure 3
Subpart HH Reporting Diagram
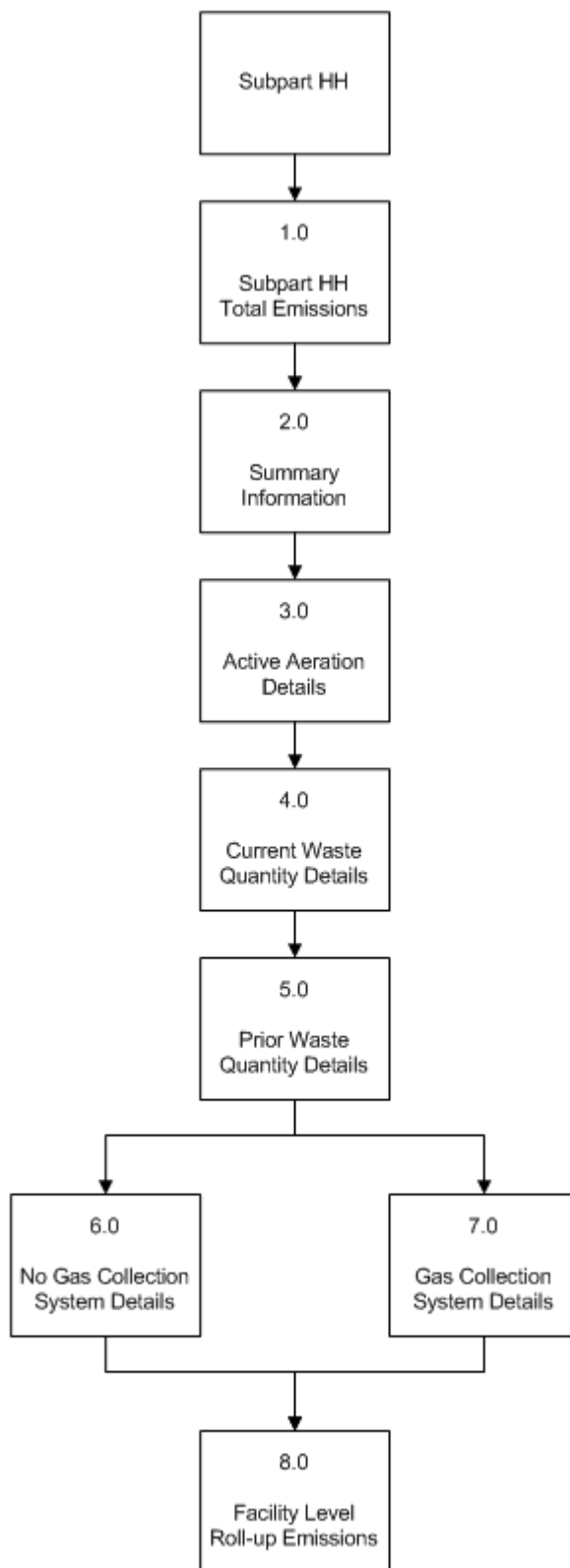
The XML schema includes the following areas for reporting for Subpart HH, as diagrammed in Figure 3:

1.0 Subpart HH Total Emissions: includes the total emissions for methane.
2.0 Summary Information: includes if the landfill was open during the reporting year and if so, the estimated year of landfill closure, if leachate recirculation is used during the reporting year and its typical frequency of use over the last 10 years, if scales are present at the landfill, if the landfill uses a gas collection system, if passive vents and/or passive flares are present at the landfill, the surface are of the landfill containing waste, and the type of cover material.
3.0 Active Aeration Details: includes information about the aeration system used by the landfill, if applicable.
4.0 Current Waste Quantity Details: includes information on the method used to determine the quantity of waste received at the landfill, type of waste, and other details for the reporting year.
5.0 Prior Waste Quantity Details: includes information on the method(s) used to determine and/or estimate the quantity of waste received at the landfill, type of waste, and other details for years prior to the reporting year.
6.0 No Gas Collection System Details: includes annual methane emissions for landfill which do not have a gas collection system.
7.0 Gas Collection System Details: includes annual volume of landfill gas collected for destruction, the concentration of methane, temperature and pressure details, if destruction occurred on-site, depths of areas of the landfill, details about the gas collection system, modeled and measured methane generation, and methane emissions.
8.0 Facility Level Roll-up Emissions: includes which emission value to add to the total emissions for the facility.

The following terminology is used throughout this document:

- Namespace: A namespace uniquely identifies a set of names such that there is no ambiguity when objects having different origins but the same names are mixed together.
- Markup Language: A way to combine text and extra information to show the structure and layout of a document. This information is expressed using markup, which is typically intermingled with the primary text. A commonly known markup language is HTML.
- XML: A markup language for documents containing structured information. The XML specification defines a standard way to add markup to documents. Its primary purpose is to facilitate the sharing of structured data across different information systems, particularly via the internet.
- XML Schema: An XML schema describes the structure of an XML document. An XML schema defines the set of rules to which the XML document must conform in order to be considered "valid" according to its schema. An instance of an XML schema is an XML schema document and is a file with the extension .xsd.
- XML Document: An XML document is a file containing data organized into a structured document using XML markup. An XML document is considered to be "well-formed" if it conforms to all XML syntax rules. An XML document is considered to be "valid" if it conforms to all the semantic rules defined by an associated XML schema. An XML document cannot be processed if it is not well-formed or valid. XML documents have the file extension .xml.
- XML Element: An XML element is a unit of the XML document that is expressed as tags in the form "<tagname>." XML elements must have either a start and end tag as in <ghg:GHGasInfoDetails> </ghg:GHGasInfoDetails> or a single empty tag name as in <ghg:GHGasInfoDetails/>. XML elements may be nested within one another in a structured hierarchy and sequence specified in an XML schema.
- XML Attribute: An XML attribute contains additional information about an XML element placed at the start tag of the XML element. XML attributes have the form attributeName = "attributeValue," as in <ghg:GHGasQuantity massUOM="Metric Tons">. XML attributes are used to report identifying information or to help e-GGRT process the data being reported within the data elements.

Rounded results from calculated values should be reported in the XML schema. Please use the following rounding rules:

1) CO_2e and CO_2 emissions data expressed in metric tons should be rounded to one decimal place. This should be done regardless of the level of data collection (e.g., unit-level, facility-level). Quantities less than 0.05 metric tons would round to 0.0 and be reported as such. Quantities greater than or equal to 0.05 metric tons would round up to 0.1 and be reported as such.
2) CH_4 emissions data expressed in metric tons should be rounded to two decimal places.
3) N_2O emissions data expressed in metric tons should be rounded to three decimal places.
4) Emissions data for all greenhouse gases other than CO_2, N_2O, and CH_4 expressed in metric tons should be rounded to the fourth digit to the right of the decimal (one tenth of a kilogram, or 1 ten thousandth of a metric ton). This rounding should be applied regardless of the level of data collection (unit, facility, etc.).
5) Other (non-emissions) quantitative data reported by the user (e.g., a monthly HHV sample result, an annual production quantity) will not need to be rounded.
6) In the case of aggregation/roll-ups, those calculations should be performed on the rounded values.

Figure 4
Subpart HH Schema Diagram
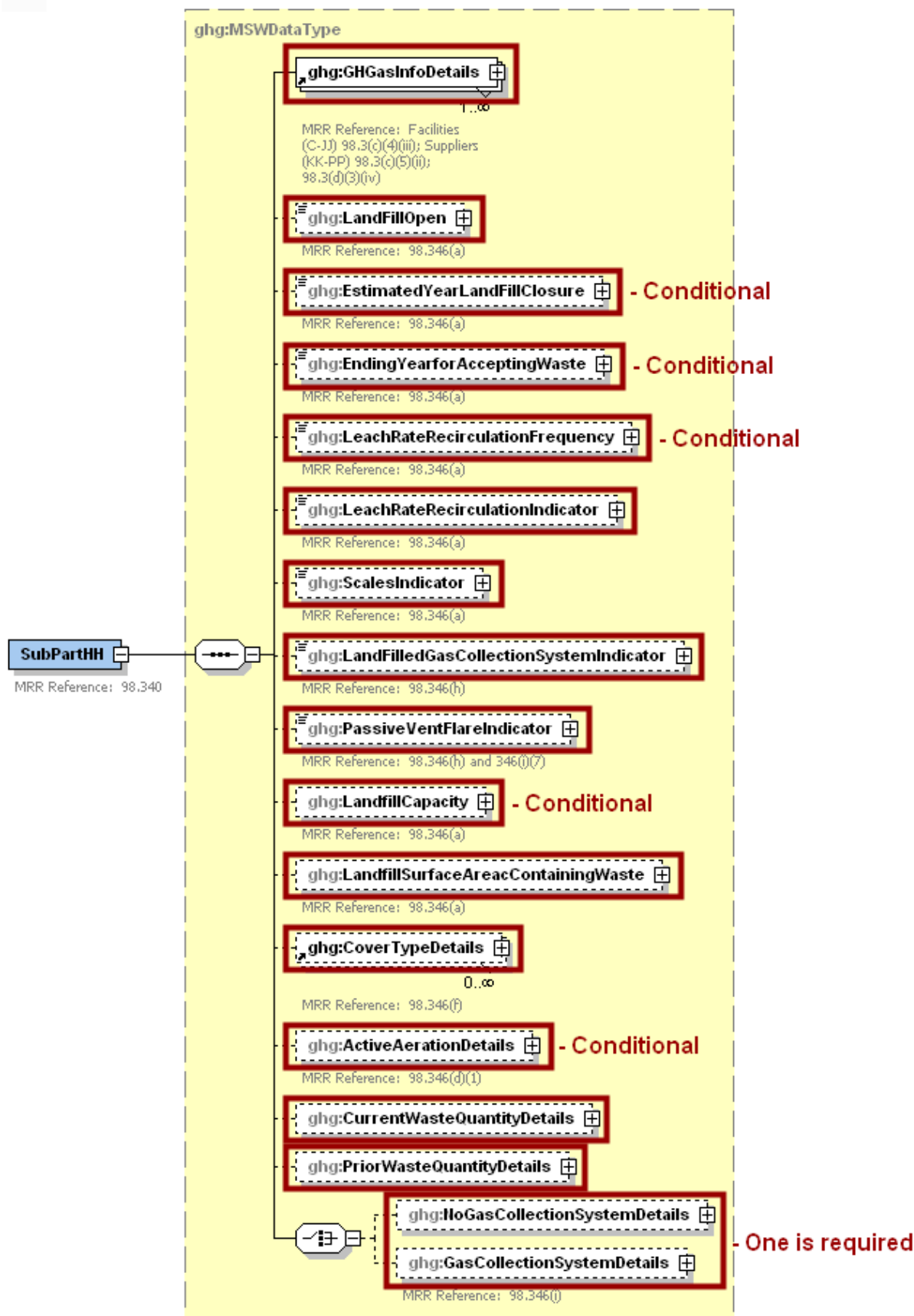
1.0 Subpart HH Total Emissions

Greenhouse gas information details comprise a collection of data elements to report the total annual emissions of each relevant greenhouse gas (GHG) listed in Table A-1 of the Mandatory Reporting of GHG, Part 98, reported under Subpart HH, expressed in metric tons.

Figure 5
Greenhouse Gas Information Details Schema Diagram
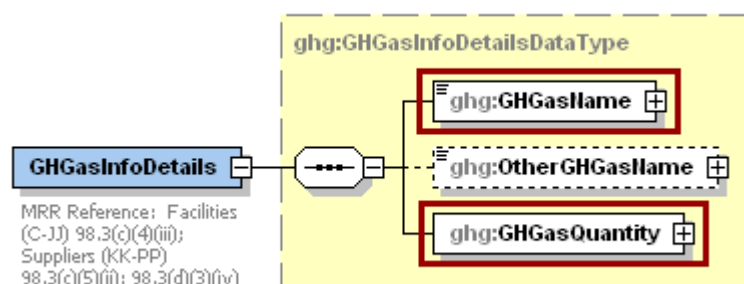
For subpart HH, report total emissions for methane (CH_4) only. For greenhouse gas quantity, report the calculated value and mass unit of measure (metric tons) only, rounded to two decimal places, according to the following guidelines:

- For landfills without landfill gas collection systems, report annual CH_4 emissions calculated from Equation HH-5.

- For landfills with landfill gas collection systems, report the larger of the following:
  - CH_4 emissions from the landfill in the reporting year calculated from Equation HH-6
  - CH_4 emissions from the landfill in the reporting year calculated from Equation HH-8.

Table 1
GHGasInfoDetails XML Data Elements

Data Element Name	Description
GHGasInfoDetails	A collection of data elements containing the total annual emissions of each greenhouse gas (GHG) listed in Table A-1 of the Mandatory Reporting of GHG, Part 98, reported under this subpart, expressed in metric tons.
GHGasName	Specify the name of the GHG: Methane
GHGasQuantity	A collection of data elements that quantify the annual emissions from this source category. Report the calculated value only using the guidelines above.
GHGasQuantity.massUOM	Metric Tons

Figure 6
Sample XML Excerpt for GHGasInfoDetails

```xml
<ghg:SubPartHH>
    <ghg:GHGasInfoDetails>
        <ghg:GHGasName>Methane</ghg:GHGasName>
        <ghg:GHGasQuantity massUOM="Metric Tons">
            <ghg:CalculatedValue>4000</ghg:CalculatedValue>
        </ghg:GHGasQuantity>
    </ghg:GHGasInfoDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

2.0 Summary Information

This section provides a step-by-step description of how to report Subpart HH municipal solid waste landfill summary information.

Figure 7
Summary Information Schema Diagram
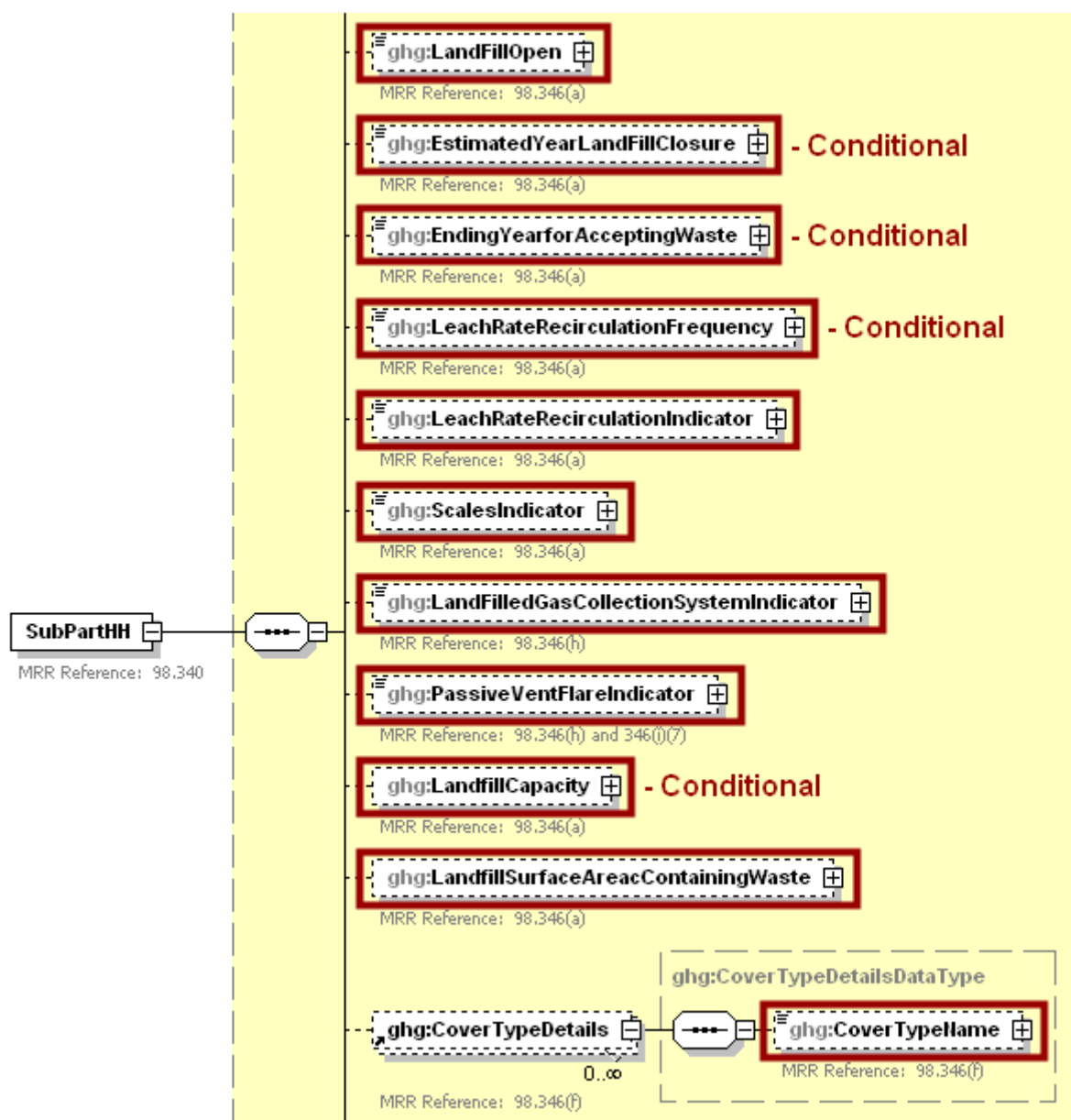
The following landfill information must be reported:

- Indicate if the landfill was open in the reporting year. A landfill is considered open if it is actively receiving waste in the reporting year. A landfill is considered closed if it is no longer receiving waste.
- If the landfill was open during the reporting year, report the estimated year of landfill closure.

- If the landfill was closed during the reporting year and Method #3 (which corresponds to Equation HH-3) is not used for HistoricalWasteQuantityMethod (see Figure 19 and Table 7), report the last year the landfill accepted waste.
- If leachate recirculation is used, indicate the typical frequency with which it is used over the past 10 years. Report one of the following:
  - Used several times a year for the past 10 years
  - Used at least once a year for the past 10 years
  - Used occasionally (but not every year) over the past 10 years
- Indicate if leachate recirculation is used at the landfill during the emissions reporting year.
- Indicate if scales are present at the landfill.
- Indicate if the landfill uses a gas collection system. A landfill gas collection system means a system of pipes used to collect landfill gas from different locations in the landfill by means of a fan or similar mechanical draft equipment to a single location for treatment or use. A single landfill may have multiple gas collection systems. Landfill gas collection systems do not include "passive" systems, whereby landfill gas flows naturally to the surface of the landfill where an opening or pipe (vent) is installed to allow for natural gas flow.
- Indicate if passive vents and/or flares are present (other than as part of a gas collection system, see previous item).
- Report the capacity of the landfill if not using Method #3 (which corresponds to Equation HH-3) for HistoricalWasteQuantityMethod (see Figure 19 and Table 7). The reporting of landfill capacity is deferred only if it is used as an input to EquationHH-3 (Method #3) regardless of whether the landfill is open or closed.
- Report the surface area of the landfill containing waste in square meters.
- Identify each type of cover material in use at the landfill. Examples of cover types:
  - Organic
  - Clay
  - Sand
  - Other soil mixture

Table 2
Summary Information XML Data Elements

Data Element Name	Description
LandFillOpen	An indication (Y/N) that the landfill was open during the reporting year.
EstimatedYearLandFillClosure	If the landfill was open during the reporting year, the estimated year of landfill closure.
EndingYearforAcceptingWaste	If the landfill was closed during the reporting year and Method #3 (which corresponds to Equation HH-3) is not used for HistoricalWasteQuantityMethod (see Figure 19 and Table 7), report the last year the landfill accepted waste.
LeachRateRecirculationFrequency	The frequency in which leachate recirculation is used over the past 10 years. See list of allowable values: Used several times a year for the past 10 years Used at least once a year for the past 10 years Used occasionally (but not every year) over the past 10 years
LeachRateRecirculationIndicator	An indication (Y/N) of whether leachate recirculation is used during the reporting year.
ScalesIndicator	An indication (Y/N) as to whether scales are present at the landfill.

Data Element Name	Description
LandFilledGasCollectionSystemIndicator	An indication (Y/N) of whether the landfill uses a gas collection system.
PassiveVentFlareIndicator	An indication (Y/N) of whether passive vents and/or passive flares (vents or flares that are not considered part of the gas collection system as defined in §98.6) are present at the landfill.
LandfillCapacity	A collection of data elements containing information on the capacity of the landfill. Report only if the landfill is not using Method #3 (which corresponds to Equation HH-3) for HistoricalWasteQuantityMethod (see Figure 19 and Table 7). Report the measured value only.
LandfillCapacity.massUOM	Metric Tons
LandfillSurfaceAreacContainingWaste	A collection of data elements containing information about the surface area of the landfill containing waste (in square meters). Report the measured value only.
LandfillSurfaceAreacContainingWaste.areaUOM	Square Meters
CoverTypeDetails	A collection of data elements containing the cover types applicable to the landfill.
CoverTypeName	The type of cover material used. See list of allowable values: Organic cover Clay cover Sand cover Other soil mixture

Figure 8
Sample XML Excerpt for Summary Information

```
<ghg:LandFillOpen>Y</ghg:LandFillOpen>
<ghg:EstimatedYearLandFillClosure>2015</ghg:EstimatedYearLandFillClosure>
<ghg:LeachRateRecirculationFrequency>Used several times a year for the past 10
years</ghg:LeachRateRecirculationFrequency>
<ghg:LeachRateRecirculationIndicator>Y</ghg:LeachRateRecirculationIndicator>
<ghg:ScalesIndicator>Y</ghg:ScalesIndicator>
<ghg:LandFilledGasCollectionSystemIndicator>Y</ghg:LandFilledGasCollectionSystemIndicator>
<ghg:PassiveVentFlareIndicator>Y</ghg:PassiveVentFlareIndicator>
<ghg:LandfillCapacity massUOM="Metric Tons">
        <ghg:MeasureValue>123456789</ghg:MeasureValue>
</ghg:LandfillCapacity>
<ghg:LandfillSurfaceAreacContainingWaste areaUOM="Square Meters">
        <ghg:MeasureValue>963852741</ghg:MeasureValue>
</ghg:LandfillSurfaceAreacContainingWaste>
<ghg:CoverTypeDetails>
        <ghg:CoverTypeName>Organic cover</ghg:CoverTypeName>
</ghg:CoverTypeDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

3.0 Active Aeration Details

A Methane Correction Factor (MCF) value other than the default may only be used if active aeration is in use at the landfill. If a Methane Correction Factor (MCF) other than the default of 1 was used for any year/waste type combination, then the following information about the aeration system must be reported:

- The aeration blower capacity in standard cubic feet per minute (scfm).
- The fraction of the landfill containing waste that is affected by the aeration as a percentage expressed as a decimal fraction between 0 and 1.
- The total number of hours during the year in which the aeration blower was operated.
- Other factors that were used as a basis for the MCF value that was used in the calculation.
- A description of the aeration system.

Figure 9
Active Aeration Details Schema Diagram
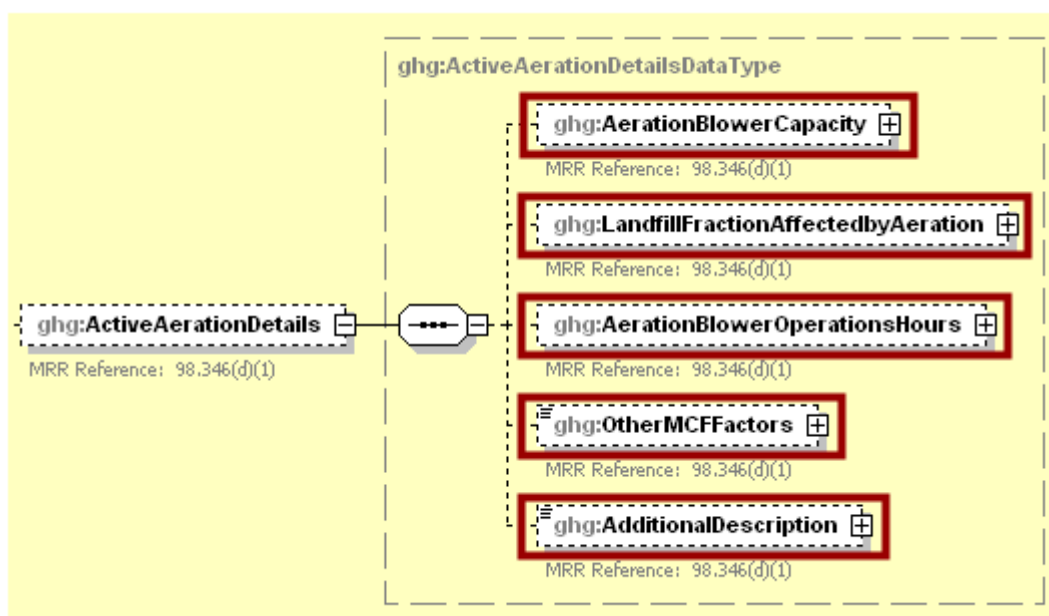
Table 3
Active Aeration XML Data Elements

Data Element Name	Description
ActiveAerationDetails	A collection of data elements containing details about the aeration system.
AerationBlowerCapacity	A collection of data elements containing information about the Aeration blower capacity. Report the measured value only.
AerationBlowerCapacity.flowUOM	scfm
LandfillFractionAffectedbyAeration	A collection of data elements containing information about the fraction of the landfill containing waste affected by the aeration. Report the measured value only.
LandfillFractionAffectedbyAeration.fractionUOM	fraction (number between 0 and 1)

Data Element Name	Description
AerationBlowerOperationsHours	A collection of data elements containing information about the total number of hours during the reporting year in which the aeration blower was operated. Report the measured value only.
AerationBlowerOperationsHours.timeUOM	Hours
OtherMCFFactors	Other factors used as a basis for the selected MCF value.
AdditionalDescription	A description of the aeration system.

Figure 10
Sample XML Excerpt for Active Aeration

```
<ghg:ActiveAerationDetails>
        <ghg:AerationBlowerCapacity flowUOM="scfm">
                <ghg:MeasureValue>741852963</ghg:MeasureValue>
        </ghg:AerationBlowerCapacity>
        <ghg:LandfillFractionAffectedbyAeration fractionUOM="fraction (number between 0 and
1)">
                <ghg:MeasureValue>0.25</ghg:MeasureValue>
        </ghg:LandfillFractionAffectedbyAeration>
        <ghg:AerationBlowerOperationsHours timeUOM="Hours">
                <ghg:MeasureValue>123</ghg:MeasureValue>
        </ghg:AerationBlowerOperationsHours>
        <ghg:OtherMCFFactors>Factors X and Y</ghg:OtherMCFFactors>
        <ghg:AdditionalDescription>Description Z</ghg:AdditionalDescription>
</ghg:ActiveAerationDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

4.0 Current Waste Quantity Details

Figure 11
Current Year Waste Quantity Details Schema Diagram
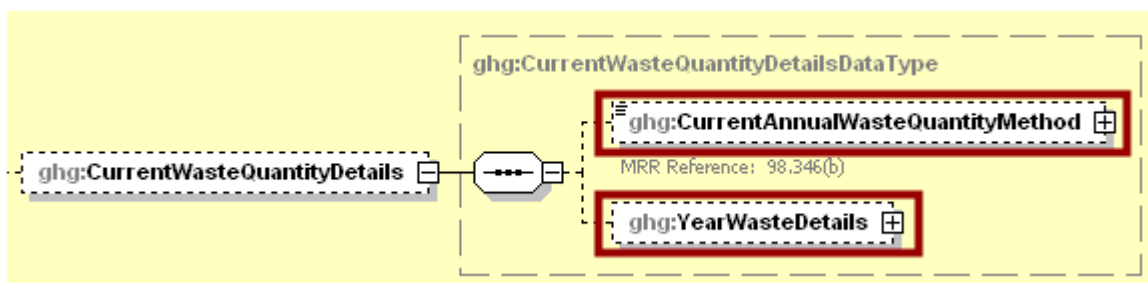
If the landfill was open in the reporting year, the method that was used to determine the quantity of waste received at the landfill in the reporting year for loads other than cars, light duty trucks, and loads that cannot be measured with scales due to physical or operational limitations must be reported. The waste quantity is considered "determined," as opposed to "estimated," if one of the following methods was used to measure the waste quantity (from Section 98.343(a)(3):

- Scales were used to weigh each load before off-loading at the landfill and either scales were used to weigh each load after off-loading or
- a representative tare weight was used for the weight of the vehicle/container after off-loading at the landfill. According to §98.343(a)(3)(i)(B), the tare weight is determined by weighing no less than five of each type of vehicle or container after it has off-loaded the waste.

- Used vehicle/container working capacity, for example by using volumetric capacity and waste density measurements for each container/vehicle used to haul waste to the landfill (§98.343(a)(3)(i)(C)). The working capacity means the maximum volume of mass of waste that is actually placed in the landfill from an individual or representative container (such as a tank, truck, or roll-off bin) used to convey wastes to the landfill, taking into account that the container may not be able to be 100 percent filled and/or 100 percent emptied for each load.

- Other. A facility may choose "other" only if best available monitoring methods (BAMM) were used per §98.3(d)(1) and (2). Facilities using BAMM after March 31, 2010 were to have received written approval from EPA to do so. Facilities that used BAMM must also specify the methods that were used in the Subpart A data element "BestAvailableMonitoringMethodsUsed".

Note: Per §98.343(a)(3), beginning in the first emissions reporting year, and each year thereafter, the waste quantities must be determined using one of the methods listed above. If scales are in place at the landfill, they must be used to determine waste quantities for the first emissions reporting year and each year after. The methods listed above may also be used for years prior to the first emissions reporting year, if such data is available.

If you changed methods used for determining the waste disposal quantities during the reporting year, report the method used at the end of the reporting year. In addition, provide an explanation as to why you changed methods, for example, scales were installed at your facility mid-year. Please provide this explanation in the Subpart A data element "CalculationMethodologyChangesDescription".

Figure 12
Current Year Waste Details Schema Diagram
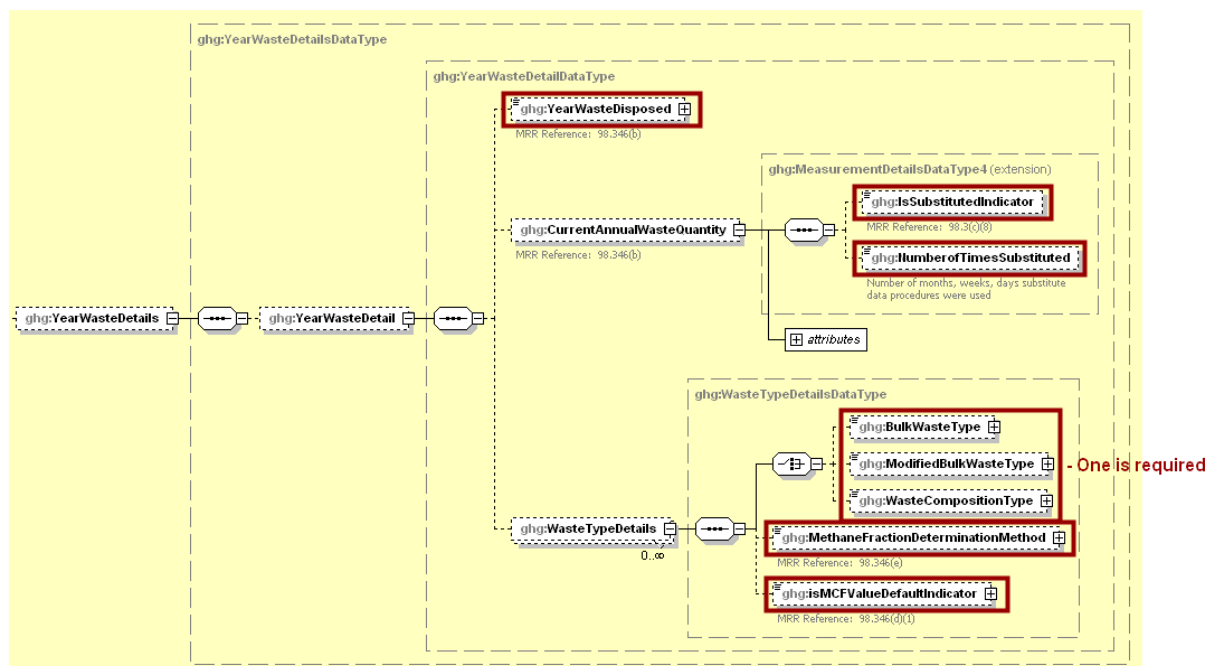
For the current reporting year, report the following information:

- Indicate if a missing data procedure was used to determine the annual waste quantity. Missing data procedures may be found in §98.345.
- If a missing data procedure was used, report the number of days that substitute data was used to determine the waste quantity.
- Identify each of the waste types comprising that year's waste quantity. A facility must report one of the three options from Table HH-1 (Bulk waste option, Modified bulk MSW option, or Waste composition option). Report all applicable waste types within the option chosen separately:
    - Bulk waste option
    - Modified Bulk MSW option
        - Bulk MSW waste (excluding inerts and C&D waste)
        - Bulk C&D waste
        - Inerts (e.g. glass, plastics, metal, cement)
    - Waste Composition option
        - Food waste
        - Garden waste
        - Paper
        - Wood and straw
        - Textiles
        - Diapers
        - Inerts (e.g., glass, plastics, metal, cement)
        - Sewage sludge
        - Bulk Waste

For each waste type reported, indicate:
- If the fraction of CH_4 in the landfill gas (-F) is based on a measured value rather than using the default value of 0.5.
- If a Methane Correction Factor (MCF) other than the default of 1 was used.

Table 4
Current Year Waste Quantity XML Data Elements

Data Element Name	Description
CurrentWasteQuantityDetails	A collection of data elements that identify the method for determining waste disposal quantities for the reporting year.
CurrentAnnualWasteQuantityMethod	The method used to determine the annual waste quantity for the current reporting year. See list of allowable values: Used scales to weigh loads before off-loading and either used scales to weigh individual loads after off-loading or used representative tare vehicle/container weights Used working capacity for each vehicle/container other
YearWasteDetails	Details about the waste disposed for the current reporting year.
YearWasteDetail	Details for the current year.
YearWasteDisposed	The current reporting year.
CurrentAnnualWasteQuantity	A collection of data elements containing information on the current annual waste quantity. Report an indication (Y/N) of whether missing data procedures were used to determine the waste quantity data and the number of days that substitute data was used to determine the waste quantity data.
WasteTypeDetails	A collection of data elements containing details about the types of waste disposed. Report each type separately.
BulkWasteType	Indicate the type of bulk waste, if applicable: Bulk waste
ModifiedBulkWasteType	Indicate the type of modified bulk waste disposed, if applicable. See list of allowable values: bulk MSW waste (excluding inerts and C&D waste) bulk C&D waste inerts
WasteCompositionType	Indicate the waste composition type, if applicable. See list of allowable values: food waste garden paper wood and straw textiles diapers inerts sewage sludge bulk waste
MethaneFractionDeterminationMethod	For the specified waste type, an indication of whether the fraction of CH_4 in landfill gas (F) was determined based on measured values or the default value. See list of allowable values: default measured
isMCFValueDefaultIndicator	An indication (Y/N) of whether the methane correction factor (MCF) default value of 1 was used for the specified waste type.

Figure 13
Sample XML Excerpt for Current Year Waste Quantity

```xml
<ghg:CurrentWasteQuantityDetails>
        <ghg:CurrentAnnualWasteQuantityMethod>Used scales to weigh loads before off-
        loading and either used scales to weigh individual loads after off-loading or used
        representative tare vehicle/container
        weights</ghg:CurrentAnnualWasteQuantityMethod>
        <ghg:YearWasteDetails>
                <ghg:YearWasteDetail>
                        <ghg:YearWasteDisposed>2010</ghg:YearWasteDisposed>
                        <ghg:CurrentAnnualWasteQuantity>
                                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndica
                                tor>
                                <ghg:NumberofTimesSubstituted>10</ghg:NumberofTim
                                esSubstituted>
                        </ghg:CurrentAnnualWasteQuantity>
                        <ghg:WasteTypeDetails>
                                <ghg:ModifiedBulkWasteType>bulk MSW waste
                                (excluding inerts and C&amp;D
                                waste)</ghg:ModifiedBulkWasteType>
                                <ghg:MethaneFractionDeterminationMethod>measured</
                                ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDef
                                aultIndicator>
                        </ghg:WasteTypeDetails>
                </ghg:YearWasteDetail>
        </ghg:YearWasteDetails>
</ghg:CurrentWasteQuantityDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

5.0 Prior Waste Quantity Details

A facility must use "determined," i.e. measured, waste quantity data for the first emissions reporting year and each year after. There are several means by which the quantities of waste disposed of prior to 2010 may have been determined or estimated for purposes of the Greenhouse Gas Reporting Program:

  1) determined using scales (see data element PriorAnnualWasteQuantityMethod);
  2) estimated from tipping receipts, other company records or measured working capacities; or
  3) estimated from one of the methods found in Section 98.343(a)(4) (see data element HistoricalWasteQuantityMethod).

Reporters must indicate the method(s) used to determine or estimate historical waste disposal quantities and the range of years in which each method was used.

Figure 14
Prior Year Waste Quantity Details Schema Diagram
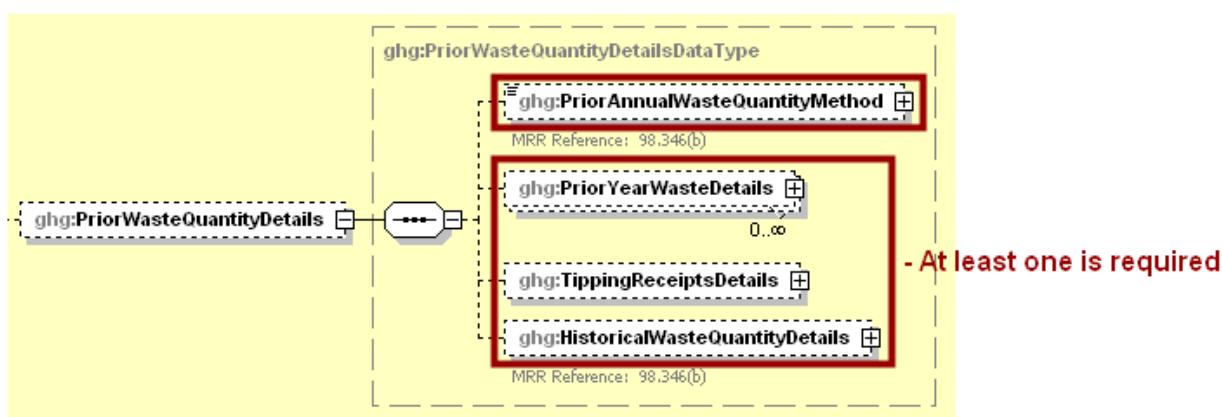
The waste quantity is considered "determined," as opposed to "estimated," if one of the following methods was used to measure the waste quantity:

- Scales were used to weigh each load both before off-loading at the landfill and either scales were used to weigh individual loads after off-loading or a representative tare weight was used for the weight of the vehicle/container after off-loading at the landfill. According to §98.343(a)(3)(i)(B), the tare weight is determined by weighing no less than five of each type of vehicle or container after it has off-loaded the waste.

- Vehicle/container working capacity was used, for example by using volumetric capacity and waste density measurements, for each container/vehicle used to haul waste to the landfill (§98.343(a)(3)(i)(C)). The working capacity means the maximum volume of mass of waste that is actually placed in the landfill from an individual or representative container (such as a tank, truck, or roll-off bin) used to convey wastes to the landfill, taking into account that the container may not be able to be 100 percent filled and/or 100 percent emptied for each load.

The methods listed above may be used for years prior to the first emissions reporting year, if such data is available.

If reporting "determined" waste quantities for years prior to the current reporting year, report the following information for each year:

- Indicate if a missing data procedure was used to determine the annual waste quantity. Missing data procedures may be found in §98.345.
- If a missing data procedure was used, report the number of days that substitute data was used to determine the waste quantity.
- Identify each of the waste types comprising this year's waste separately. A facility must report at least one of the types and may report multiple types:
    - Bulk waste
    - Modified Bulk MSW
        - Bulk MSW waste (excluding inerts and C&D waste)
        - Bulk C&D waste
        - Inerts (e.g. glass, plastics, metal, cement)
    - Waste Composition
        - Food waste
        - Garden waste
        - Paper
        - Wood and straw
        - Textiles
        - Diapers
        - Inerts (e.g., glass, plastics, metal, cement)
        - Sewage sludge
        - Bulk waste

For each waste type reported, indicate:

- If the fraction of CH_4 in the landfill gas (F) is based on a measured value rather than using the default value of 0.5.
- If a Methane Conversion Factor (MCF) other than the default of 1 was used.

Figure 15
Prior Year Waste Details Schema Diagram

Table 5
Prior Year Waste Quantity XML Data Elements

Data Element Name	Description
PriorWasteQuantityDetails	A collection of data elements that identify the method for determining or estimating historical waste disposal quantities, reason for its selection, and the range of years it is applied.
PriorAnnualWasteQuantityMethod	An indication (Y/N) if scales were used to determine the annual waste disposal quantities for any years prior to 2010 for loads other than cars, light duty trucks, and loads that cannot be measured with scales due to physical or operational limitations.
PriorYearWasteDetails	Details about the waste disposed during prior years if the quantity was "determined" (if indicated above that scales were used).
YearWasteDetail	Details for a single year in which scales were used for estimating prior annual waste disposal quantities. Report each year separately.
YearWasteDisposed	The year scales were used. Report each year separately.
CurrentAnnualWasteQuantity	A collection of data elements containing information on the annual waste quantity for the year specified. Report an indication (Y/N) of whether missing data procedures were used to determine the waste quantity data and the number of days that substitute data was used to determine the waste quantity data.
WasteTypeDetails	A collection of data elements containing details about the types of waste disposed. Report only one type at a time.
BulkWasteType	Indicate the type of bulk waste, if applicable: Bulk waste

Data Element Name	Description
ModifiedBulkWasteType	Indicate the type of modified bulk waste disposed, if applicable. See list of allowable values: bulk MSW waste (excluding inerts and C&D waste) bulk C&D waste inerts
WasteCompositionType	Indicate the waste composition type, if applicable. See list of allowable values: food waste garden paper wood and straw textiles diapers inerts sewage sludge bulk waste
MethaneFractionDeterminationMethod	For the specified waste type, an indication of whether the fraction of CH_4 in landfill gas (F) was determined based on measured values or the default value. See list of allowable values: default measured
isMCFValueDefaultIndicator	An indication (Y/N) of whether the methane correction factor (MCF) default value of 1 was used.

Figure 16
Sample XML Excerpt for Prior Year Waste Quantity

```
<ghg:PriorWasteQuantityDetails>
        <ghg:PriorAnnualWasteQuantityMethod>Y</ghg:PriorAnnualWasteQuantityMethod>
        <ghg:PriorYearWasteDetails>
                <ghg:YearWasteDetail>
                        <ghg:YearWasteDisposed>2009</ghg:YearWasteDisposed>
                        <ghg:CurrentAnnualWasteQuantity>
                                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicat
                                or>
                                <ghg:NumberofTimesSubstituted>20</ghg:NumberofTim
                                esSubstituted>
                        </ghg:CurrentAnnualWasteQuantity>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>food
                                waste</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</
                                ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDef
                                aultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>wood and
                                straw</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</
                                ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDef
                                aultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>diapers</ghg:WasteCompo
                                sitionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</
                                ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDef
                                aultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>sewage
                                sludge</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</
                                ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDef
                                aultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>inerts</ghg:WasteComposi
                                tionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</
                                ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDef
                                aultIndicator>
                        </ghg:WasteTypeDetails>
                </ghg:YearWasteDetail>
        </ghg:PriorYearWasteDetails>
        <ghg:PriorYearWasteDetails>
                <ghg:YearWasteDetail>
                        <ghg:YearWasteDisposed>2008</ghg:YearWasteDisposed>
                        <ghg:CurrentAnnualWasteQuantity>
                                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicat
                                or>
                                <ghg:NumberofTimesSubstituted>30</ghg:NumberofTim
                                esSubstituted>
                        </ghg:CurrentAnnualWasteQuantity>
                        <ghg:WasteTypeDetails>
                                <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                                <ghg:MethaneFractionDeterminationMethod>measured</
                                ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDef
                                aultIndicator>
                        </ghg:WasteTypeDetails>
                </ghg:YearWasteDetail>
        </ghg:PriorYearWasteDetails>
```
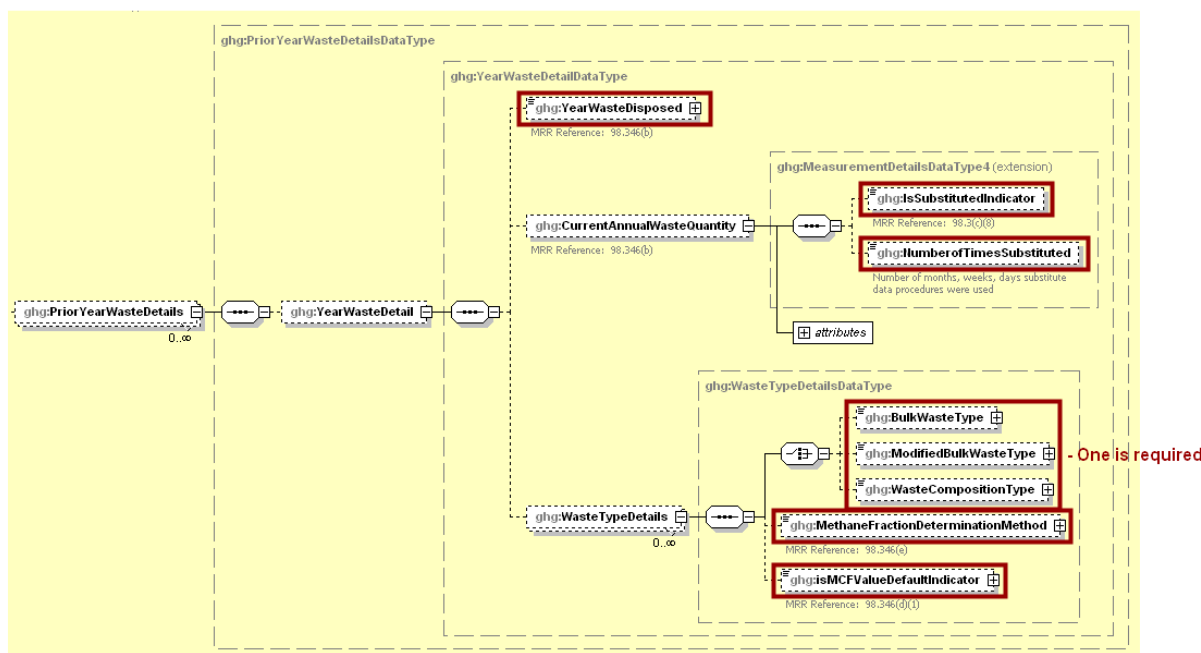
Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

Figure 17
Tipping Receipts Details Schema Diagram
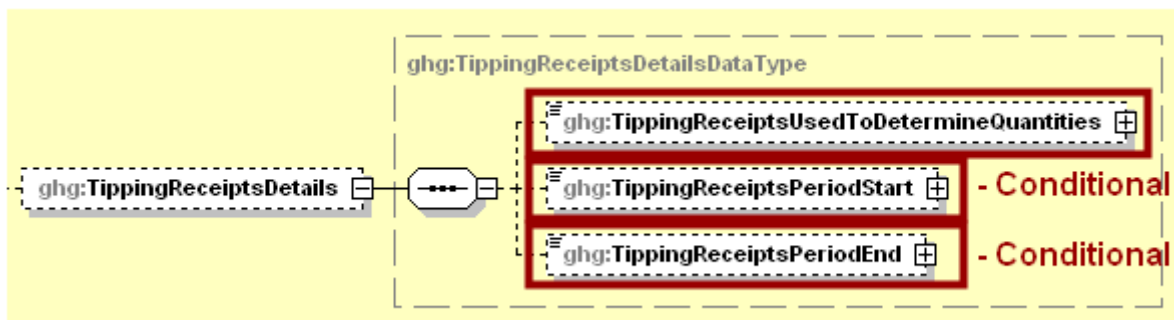
Indicate if tipping receipts, other company records or measured working capacities were used to determine quantities of waste for years prior to 2010. If so, indicate the year in which these receipts/records started being used and the year in which they stopped being used.

Table 6
Tipping Receipts XML Data Elements

Data Element Name	Description
TippingReceiptsDetails	A collection of data elements containing details about the use of tipping receipts.
TippingReceiptsUsedToDetermineQuantities	An indication (Y/N) of whether tipping receipts, other company records or measured working capacities were used to determine quantities of waste for years prior to 2010.
TippingReceiptsPeriodStart	The starting year that tipping receipts/company records were used to determine the quantities of waste, if applicable.
TippingReceiptsPeriodEnd	The ending year that tipping receipts/company records were used to determine the quantities of waste, if applicable.

Figure 18
Sample XML Excerpt for Tipping Receipts

```
<ghg:TippingReceiptsDetails>
        <ghg:TippingReceiptsUsedToDetermineQuantities>Y</ghg:TippingReceiptsUsedToDetermineQuantities>
        <ghg:TippingReceiptsPeriodStart>1991</ghg:TippingReceiptsPeriodStart>
        <ghg:TippingReceiptsPeriodEnd>2000</ghg:TippingReceiptsPeriodEnd>
</ghg:TippingReceiptsDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

Figure 19
Historical Waste Quantity Details Schema Diagram
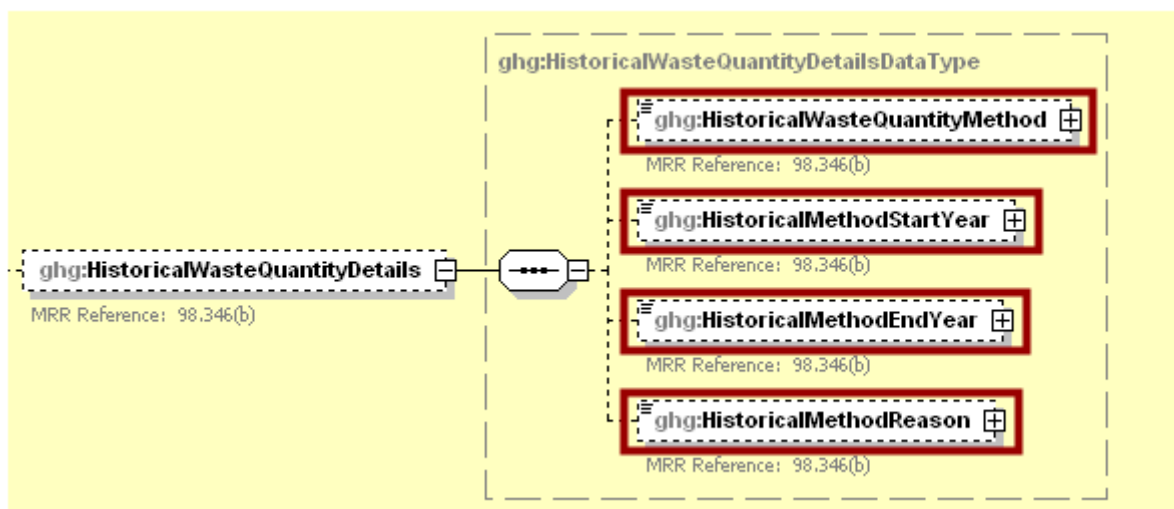
Indicate the method used to estimate all annual waste quantities that were not determined with the methods listed in the data element PriorAnnualWasteQuantityMethod or estimated through tipping receipts, other company records or measured working capacities. Only waste quantities for years prior to the first emissions reporting year may be estimated. Per §98.343(a)(4), one of the following methods may be used to estimate waste quantities:

- Method #1: Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which the waste quantities are available.

- Method #2: Use the estimated population served by the landfill in each year multiplied by the values for national average per capita waste disposal rates found in Table HH-2, to calculate the waste quantity landfilled per Equation HH-2.

- Method #3: Use the landfill capacity or, for operating landfills, the amount of waste-in-place to estimate a constant average waste disposal quantity per Equation HH-3. The amount of waste-in place is the capacity of the landfill used at the end of the year prior to the year when waste disposal data are available. The waste-in-place numbers may be derived from design drawings or engineering estimates.

If all waste quantities were either determined using scales or estimated using tipping receipts, other company records or measured working capacities, report "None".

If one of these methods was used (i.e., "None" was not reported), indicate the year in which the method started being used, the year in which it stopped being used and indicate the reason for which this particular method was selected.

Table 7
Historical Waste Quantity XML Data Elements

Data Element Name	Description
HistoricalWasteQuantityDetails	A collection of data elements containing details about the method used to estimate the historical quantity of waste.
HistoricalWasteQuantityMethod	Indicate the method used to estimate the historical quantity of waste. See list of allowable values: Method #1: Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which waste quantities are available. Method #2: Use the estimated population served by the landfill in each year, the values for national average per capita waste generation, and fraction of generated waste disposed of in solid waste disposal sites (Equation HH-2). Method #3: Use the landfill capacity or, for operating landfills, the amount of waste-in-place to estimate a constant average waste disposal quantity (Equation HH-3). None
HistoricalMethodStartYear	The starting year that the method specified was used to estimate the quantity of waste.
HistoricalMethodEndYear	The ending year that the method specified was used to estimate the quantity of waste.
HistoricalMethodReason	Explain the reason that the method specified was chosen to estimate the historical quantity of waste.

Figure 20
Sample XML Excerpt for Historical Waste Quantity

```
<ghg:HistoricalWasteQuantityDetails>
        <ghg:HistoricalWasteQuantityMethod>Method #1:  Assume all prior year's
        waste disposal quantities are the same as the waste quantity in the first year
        for which waste quantities are
        available.</ghg:HistoricalWasteQuantityMethod>
        <ghg:HistoricalMethodStartYear>1981</ghg:HistoricalMethodStartYear>
        <ghg:HistoricalMethodEndYear>1990</ghg:HistoricalMethodEndYear>
        <ghg:HistoricalMethodReason>This was the best method to
        use.</ghg:HistoricalMethodReason>
</ghg:HistoricalWasteQuantityDetails>
</ghg:PriorWasteQuantityDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

6.0 No Gas Collection System Details

A landfill gas collection system means a system of pipes used to collect landfill gas from different locations in the landfill by means of a fan or similar mechanical draft equipment to a single location for treatment or use. A single landfill may have multiple gas collection systems. Landfill gas collection systems do not include "passive" systems, whereby landfill gas flows naturally to the surface of the landfill where an opening or pipe (vent) is installed to allow for natural gas flow.

For landfills that do not have a gas collection system, report the value for CH_4 generation, adjusted for oxidation, from the landfill in the reporting year (in metric tons of CH_4). This equation may be calculated using the spreadsheet tool for Equation HH-5. Spreadsheets are also available for calculating inputs to Equation HH-5. Use the Subpart H-1 and HH-2, HH-3 spreadsheets to calculate inputs to Equation HH-5 as needed.

Figure 21
No Gas Collection System Details Schema Diagram
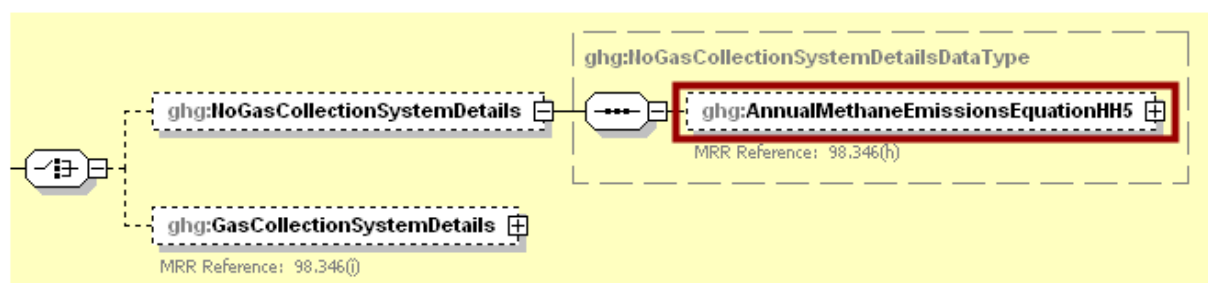
Table 8
No Gas Collection System XML Data Elements

Data Element Name	Description
NoGasCollectionSystemDetails	A collection of data elements for landfills without gas collection systems.
AnnualMethaneEmissionsEquationHH5	A collection of data elements containing information about the annual CH_4 emissions, i.e., the annual methane generation, adjusted for oxidation, calculated using Equation HH-5. Report only for landfills that do not have a landfill gas collection system. Report the calculated value only.
AnnualMethaneEmissionsEquationHH5.massUOM	Metric Tons

Figure 22
Sample XML Excerpt for No Gas Collection System

```
<ghg:NoGasCollectionSystemDetails>
        <ghg:AnnualMethaneEmissionsEquationHH5 massUOM="Metric Tons">
                <ghg:CalculatedValue>100.0</ghg:CalculatedValue>
        </ghg:AnnualMethaneEmissionsEquationHH5>
</ghg:NoGasCollectionSystemDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

7.0 Gas Collection System Details

Figure 23
Gas Collection System Details Schema Diagram
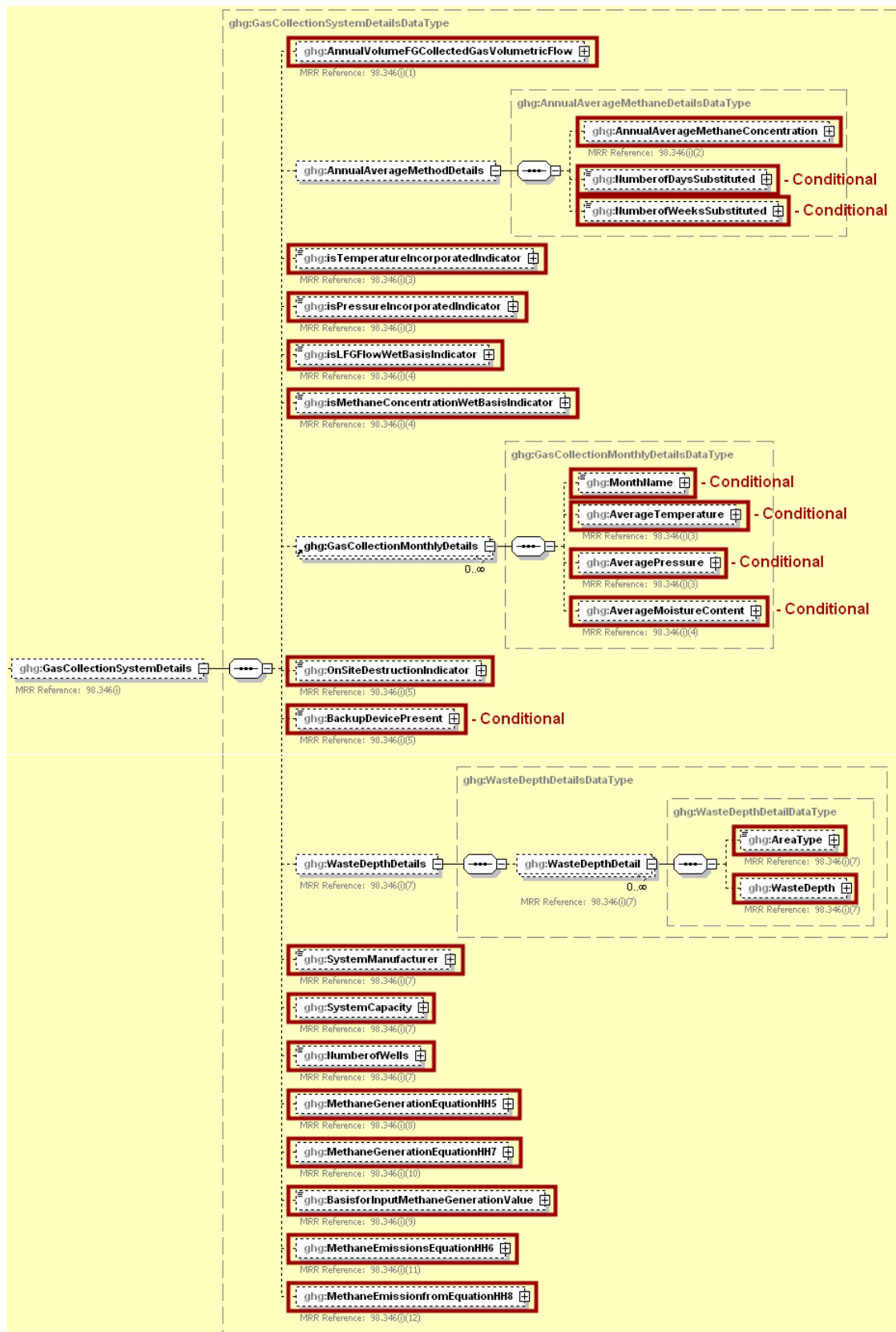
For landfills that have a gas collection system, the following information must be reported:

- Annual volume of landfill gas collected for destruction (in scf).
  - Indicate if a missing data procedure was used to determine the volume of the landfill gas collected for destruction (information about appropriate procedures for estimating missing data is found in §98.345).
  - If a missing data procedure was used, report the number of days when a substitute data procedure was used to determine the volume of the landfill gas collected for destruction.

- Annual average concentration of CH_4 in landfill gas collected for destruction.
  - Indicate if a missing data procedure was used to determine the concentration of CH_4 of landfill gas collected for destruction (information about appropriate procedures for estimating missing data are found in §98.345).
  - If a missing data procedure was used and the CH_4 concentration is monitored continuously, report the number of days substitute data was used to determine the annual average CH_4 concentration of landfill gas collected for destruction.
  - If a missing data procedure was used and the CH_4 concentration is monitored weekly, the number of weeks substitute data was used to determine the annual average CH_4 concentration of landfill gas collected for destruction.

  Note: In the case of multiple measurement locations, you may report values for both days and weeks when CH_4 concentration is measured continuously at some locations and weekly at others.

Table 9
Gas Collection System XML Data Elements

Data Element Name	Description
GasCollectionSystemDetails	A collection of data elements for landfills with gas collection systems.
AnnualVolumeFGCollectedGasVolumetricFlow	A collection of data elements containing information about the total volume of landfill gas collected for destruction for the reporting year (cubic feet at 520°R or 60° F and 1 atm). Report the measured value, an indication (Y/N) of whether missing data procedures were used to determine the total annual volume of landfill gas collected for destruction and the number of days that substitute data was used to determine the total annual volume of landfill gas collected for destruction.
AnnualVolumeFGCollectedGasVolumetricFlow.volUOM	scf
AnnualAverageMethodDetails	
AnnualAverageDailyMethaneConcentration	A collection of data elements containing information about the annual average CH_4 concentration of landfill gas collected for destruction. Report the measured value (in percent) and an indication (Y/N) of whether missing data procedures were used to determine the annual average CH_4 concentration of landfill gas collected for destruction.
AnnualAverageDailyMethaneConcentration.percentUOM	Number (between 0 and 100)

(cont.)

Table 9
Gas Collection System XML Data Elements (cont.)

Data Element Name	Description
NumberofDaysSubstituted	The number of days substitute data was used to determine the annual average CH_4 concentration of landfill gas collected for destruction (integer) if CH_4 concentration is monitored continuously.
NumberofWeeksSubstituted	The number of weeks substitute data was used to determine the annual average CH_4 concentration of landfill gas collected for destruction (integer) if CH_4 concentration is monitored weekly.

Figure 24
Sample XML Excerpt for Gas Collection System

```
<ghg:GasCollectionSystemDetails>
        <ghg:AnnualVolumeFGCollectedGasVolumetricFlow volUOM="scf">
                <ghg:MeasureValue>963852741</ghg:MeasureValue>
                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
                <ghg:NumberofTimesSubstituted>100</ghg:NumberofTimesSubstituted>
        </ghg:AnnualVolumeFGCollectedGasVolumetricFlow>
        <ghg:AnnualAverageMethodDetails>
                <ghg:AnnualAverageMethaneConcentration percentUOM="Number (between
                0 and 100)">
                        <ghg:MeasureValue>50</ghg:MeasureValue>
                        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
                </ghg:AnnualAverageMethaneConcentration>
                <ghg:NumberofDaysSubstituted>60</ghg:NumberofDaysSubstituted>
        </ghg:AnnualAverageMethodDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

For landfills that have a gas collection system, the following information must be reported:

- Indicate if temperature was incorporated into internal calculations run by the collection system's monitoring equipment.
- Indicate if pressure was incorporated into internal calculations run by the collection system's monitoring equipment.
- Indicate whether landfill gas flow was measured on a wet or a dry basis.
- Indicate whether CH_4 concentration was measured on a wet or a dry basis.
- If temperature was not incorporated into the internal calculations run by the collection system's monitoring equipment, report the average monthly temperature at which the landfill gas flow was measured (in degrees Rankine) for each month of the reporting year.
- If pressure was not incorporated into the internal calculations run by the collection system's monitoring equipment, report the average monthly pressure at which the landfill gas flow was measured (in atmospheres) for each month of the reporting year.
- If landfill gas flow was measured on a wet basis and CH_4 concentration was measured on a dry basis, or gas flow was measured on a dry basis and CH_4 concentration was measured on a wet basis, provide the monthly average moisture content (expressed as a decimal fraction) for each month of the reporting year.
- Indicate whether landfill gas destruction occurred at the facility (on-site), off-site or both.
- If landfill gas destruction occurred at the facility, indicate if a back-up destruction device is present at the facility.

Table 10
Additional Gas Collection System XML Data Elements

Data Element Name	Description
isTemperatureIncorporatedIndicator	An indication (Y/N) of whether temperature is incorporated into internal calculations run by the collection system's monitoring equipment.
isPressureIncorporatedIndicator	An indication (Y/N) of whether pressure is incorporated into internal calculations run by the collection system's monitoring equipment.
isLFGFlowWetBasisIndicator	An indication (Y/N) of whether the landfill gas flow was measured on a wet basis.
isMethaneConcentrationWetBasisIndicator	An indication (Y/N) of whether CH_4 concentration was measured on a wet basis.
GasCollectionMonthlyDetails	A collection of data elements with information for each month in which the temperature or pressure was not incorporated into internal calculations or either the landfill gas flow was measured on a wet basis and the methane concentration was not or the methane concentration was measured on a wet basis and the landfill gas flow was not.
MonthName	The name of each month. Report data for each month separately.
AverageTemperature	For the month specified, a collection of data elements about the average temperature at which flow is measured if temperature is not incorporated into internal calculations run by the collection system's monitoring equipment. Report the measured value only.
AverageTemperature.tempUOM	Rankine
AveragePressure	For the month specified, a collection of data elements about the average pressure at which flow is measured if pressure is not incorporated into internal calculations run by the collection system's monitoring equipment. Report the measured value only.
AveragePressure.pressureUOM	atmosphere
AverageMoistureContent	For the month specified, a collection of data elements about the average moisture content. Report if landfill gas flow was measured on a wet basis and CH_4 concentration was measured on a dry basis, or gas flow was measured on a dry basis and CH_4 concentration was measured on a wet basis. Report the measured value only.
AverageMoistureContent.fractionUOM	decimal fraction
OnSiteDestructionIndicator	An indication of whether destruction occurs onsite at the landfill facility, off-site or both. See list of allowable values. On-site Off-site Both
BackupDevicePresent	If destruction occurs onsite at the landfill facility, an indication (Y/N) of whether a back-up destruction device is present at the landfill.

Figure 25
Sample XML Excerpt for Gas Collection Monthly Details

```
<ghg:isTemperatureIncorporatedIndicator>N</ghg:isTemperatureIncorporatedIndicator>
<ghg:isPressureIncorporatedIndicator>N</ghg:isPressureIncorporatedIndicator>
<ghg:isLFGFlowWetBasisIndicator>Y</ghg:isLFGFlowWetBasisIndicator>
<ghg:isMethaneConcentrationWetBasisIndicator>N</ghg:isMethaneConcentrationWetBasisIndicator>
<ghg:GasCollectionMonthlyDetails>
        <ghg:MonthName>January</ghg:MonthName>
        <ghg:AverageTemperature tempUOM="Rankine">
                <ghg:MeasureValue>560</ghg:MeasureValue>
        </ghg:AverageTemperature>
        <ghg:AveragePressure pressureUOM="atmosphere">
                <ghg:MeasureValue>100</ghg:MeasureValue>
                </ghg:AveragePressure>
        <ghg:AverageMoistureContent fractionUOM="fraction (number between 0 and 1)">
                <ghg:MeasureValue>0.1</ghg:MeasureValue>
        </ghg:AverageMoistureContent>
</ghg:GasCollectionMonthlyDetails>
<ghg:GasCollectionMonthlyDetails>
        <ghg:MonthName>February</ghg:MonthName>
        <ghg:AverageTemperature tempUOM="Rankine">
                <ghg:MeasureValue>570</ghg:MeasureValue>
        </ghg:AverageTemperature>
        <ghg:AveragePressure pressureUOM="atmosphere">
                <ghg:MeasureValue>110</ghg:MeasureValue>
        </ghg:AveragePressure>
        <ghg:AverageMoistureContent fractionUOM="fraction (number between 0 and 1)">
                <ghg:MeasureValue>0.2</ghg:MeasureValue>
        </ghg:AverageMoistureContent>
</ghg:GasCollectionMonthlyDetails>
<ghg:GasCollectionMonthlyDetails>
        <ghg:MonthName>March</ghg:MonthName>
        <ghg:AverageTemperature tempUOM="Rankine">
                <ghg:MeasureValue>580</ghg:MeasureValue>
        </ghg:AverageTemperature>
        <ghg:AveragePressure pressureUOM="atmosphere">
                <ghg:MeasureValue>120</ghg:MeasureValue>
        </ghg:AveragePressure>
        <ghg:AverageMoistureContent fractionUOM="fraction (number between 0 and 1)">
                <ghg:MeasureValue>0.3</ghg:MeasureValue>
        </ghg:AverageMoistureContent>
</ghg:GasCollectionMonthlyDetails>
<ghg:GasCollectionMonthlyDetails>
        <ghg:MonthName>April</ghg:MonthName>
        <ghg:AverageTemperature tempUOM="Rankine">
                <ghg:MeasureValue>590</ghg:MeasureValue>
        </ghg:AverageTemperature>
        <ghg:AveragePressure pressureUOM="atmosphere">
                <ghg:MeasureValue>130</ghg:MeasureValue>
        </ghg:AveragePressure>
        <ghg:AverageMoistureContent fractionUOM="fraction (number between 0 and 1)">
                <ghg:MeasureValue>0.4</ghg:MeasureValue>
        </ghg:AverageMoistureContent>
</ghg:GasCollectionMonthlyDetails>
<ghg:GasCollectionMonthlyDetails>
        <ghg:MonthName>December</ghg:MonthName>
        <ghg:AverageTemperature tempUOM="Rankine">
                <ghg:MeasureValue>530</ghg:MeasureValue>
        </ghg:AverageTemperature>
        <ghg:AveragePressure pressureUOM="atmosphere">
                <ghg:MeasureValue>210</ghg:MeasureValue>
        </ghg:AveragePressure>
        <ghg:AverageMoistureContent fractionUOM="fraction (number between 0 and 1)">
                <ghg:MeasureValue>0.13</ghg:MeasureValue>
        </ghg:AverageMoistureContent>
</ghg:GasCollectionMonthlyDetails>
<ghg:OnSiteDestructionIndicator>Both</ghg:OnSiteDestructionIndicator>
<ghg:BackupDevicePresent>Y</ghg:BackupDevicePresent>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

For landfills with a gas collection system in place, the following information must be reported on the estimated waste depths (in meters) for each area below (as listed in Table HH-3):

- Depth of area with no waste in place (A1, in meters). Note: In many cases, the depth of area with no waste in place will be zero.
- Depth of area without active gas collection, regardless of cover type (A2, in meters).
- Depth of area with daily soil cover and active gas collection (A3, in meters).
- Depth of area with an intermediate soil cover, or a final soil cover not meeting the criteria below, and active gas collection (A4, in meters).
- Depth of area with a final soil cover of 3 feet or thicker of clay and/or geomembrane cover system and active gas collection (A5, in meters).

Provide the following information about the landfill gas collection system:

- The entity that designed the gas collection system and the entity that installed the gas collection system. If this information is not available, report the manufacturer of the blower. Do not use this space to indicate the manufacturer of the flares in the place at the landfill.
- The capacity of the landfill gas collection system (actual cubic feet per minute, acfm).
- The number of wells that are part of the landfill gas collection system.

Table 11
Waste Depth Details XML Data Elements

Data Element Name	Description
WasteDepthDetails	Details about the waste depth in each area the landfill as specified in Table HH-3.
WasteDepthDetail	Details about a specific area. Report each area separately.
AreaType	The specific area type from Table HH-3. See list of allowable values: A1 A2 A3 A4 A5
WasteDepth	For the area specified, a collection of data elements about the waste depth. Report the measured value only.
WasteDepth.heightUOM	Meters
SystemManufacturer	The entity that designed the gas collection system and the entity that installed the gas collection system. If this information is not available, report the manufacturer of the blower.
SystemCapacity	A collection of data elements about the system capacity of the gas collection system (measured value in actual cubic feet per minute). Report the measured value only.
SystemCapacity.flowUOM	acfm
NumberofWells	The number of wells used in the gas collection system (integer format).

Figure 26
Sample XML Excerpt for Waste Depth Details

```xml
<ghg:WasteDepthDetails>
        <ghg:WasteDepthDetail>
                <ghg:AreaType>A1</ghg:AreaType>
                <ghg:WasteDepth heightUOM="Meters">
                        <ghg:MeasureValue>500</ghg:MeasureValue>
                </ghg:WasteDepth>
        </ghg:WasteDepthDetail>
        <ghg:WasteDepthDetail>
                <ghg:AreaType>A2</ghg:AreaType>
                <ghg:WasteDepth heightUOM="Meters">
                        <ghg:MeasureValue>400</ghg:MeasureValue>
                </ghg:WasteDepth>
        </ghg:WasteDepthDetail>
        <ghg:WasteDepthDetail>
        <ghg:AreaType>A3</ghg:AreaType>
                <ghg:WasteDepth heightUOM="Meters">
                        <ghg:MeasureValue>300</ghg:MeasureValue>
                </ghg:WasteDepth>
        </ghg:WasteDepthDetail>
        <ghg:WasteDepthDetail>
                <ghg:AreaType>A4</ghg:AreaType>
                <ghg:WasteDepth heightUOM="Meters">
                        <ghg:MeasureValue>200</ghg:MeasureValue>
                </ghg:WasteDepth>
        </ghg:WasteDepthDetail>
        <ghg:WasteDepthDetail>
                <ghg:AreaType>A5</ghg:AreaType>
                <ghg:WasteDepth heightUOM="Meters">
                        <ghg:MeasureValue>100</ghg:MeasureValue>
                </ghg:WasteDepth>
        </ghg:WasteDepthDetail>
</ghg:WasteDepthDetails>
<ghg:SystemManufacturer>Acme Corporation</ghg:SystemManufacturer>
<ghg:SystemCapacity flowUOM="acfm">
        <ghg:MeasureValue>987654321</ghg:MeasureValue>
</ghg:SystemCapacity>
<ghg:NumberofWells>1000</ghg:NumberofWells>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

Report the following values (in metric tons of CH_4):

- Modeled CH_4 generation, adjusted for oxidation (using Equation HH-5).
- Measured CH_4 generation, adjusted for oxidation (using Equation HH-7).
- CH_4 emissions from the landfill during the reporting year (using Equation HH-6) along with an indication of whether this is a measured (output of Equation HH-4) or modeled (output of Equation HH-1) value.
- CH_4 emissions from the landfill during the reporting year (using Equation HH-8).

The equations may be calculated using the spreadsheet tool provided. Spreadsheets are also available for calculating inputs to the equations. Use the Subpart HH-1, HH-2, HH-3, and HH-4 spreadsheets to calculate inputs as needed.

Table 12
Methane Generation XML Data Elements

Data Element Name	Description
MethaneGenerationEquationHH5	A collection of data elements about the modeled methane generation adjusted for oxidation calculated using Equation HH-5 (decimal format). Report the calculated value only.
MethaneGenerationEquationHH5.massUOM	Metric Tons
MethaneGenerationEquationHH7	A collection of data elements about the annual methane generation adjusted for oxidation calculated using Equation HH-7 (decimal format). Report the calculated value only.
MethaneGenerationEquationHH7.massUOM	Metric Tons
BasisforInputMethaneGenerationValue	Indicate if the value of methane generation used in Equation HH-6 was modeled from Equation HH-1 or measured from Equation HH-4. See list of allowable values: Equation HH-1 Equation HH-4
MethaneEmissionsEquationHH6	A collection of data elements about the annual CH_4 emissions calculated using Equation HH-6 (decimal format). Report the calculated value only.
MethaneEmissionsEquationHH6.massUOM	Metric Tons
MethaneEmissionfromEquationHH8	A collection of data elements about the annual CH_4 emissions calculated using Equation HH-8 (decimal format). Report the calculated value only.
MethaneEmissionfromEquationHH8.massUOM	Metric Tons

Figure 27
Sample XML Excerpt for Methane Generation Equations

```xml
<ghg:MethaneGenerationEquationHH5 massUOM="Metric Tons">
        <ghg:CalculatedValue>1000</ghg:CalculatedValue>
</ghg:MethaneGenerationEquationHH5>
<ghg:MethaneGenerationEquationHH7 massUOM="Metric Tons">
        <ghg:CalculatedValue>2000</ghg:CalculatedValue>
</ghg:MethaneGenerationEquationHH7>
<ghg:BasisforInputMethaneGenerationValue>Equation HH-
1</ghg:BasisforInputMethaneGenerationValue>
<ghg:MethaneEmissionsEquationHH6 massUOM="Metric Tons">
        <ghg:CalculatedValue>3000.00</ghg:CalculatedValue>
</ghg:MethaneEmissionsEquationHH6>
<ghg:MethaneEmissionfromEquationHH8 massUOM="Metric Tons">
        <ghg:CalculatedValue>4000.00</ghg:CalculatedValue>
</ghg:MethaneEmissionfromEquationHH8>
    </ghg:GasCollectionSystemDetails>
</ghg:SubPartHH>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

8.0 Facility-Level Roll-up Emissions

Each facility must report the following facility-level emission totals:
- Total CO_2 equivalent (CO_2e) emissions (excluding biogenic CO_2) aggregated across all direct emitter source categories (subparts C-HH) associated with the facility.
- Total biogenic CO_2 emissions aggregated across all direct emitter source categories (subparts C-HH) associated with the facility.

Each supplier must report the following supplier totals:
- Total CO_2e associated with products supplied aggregated across subparts NN, OO and PP (as applicable). Do not include subpart LL and MM totals in this data element as these values are not being collected in e-GGRT.

Figure 28
Facility-Level Roll-up Emissions Schema Diagram
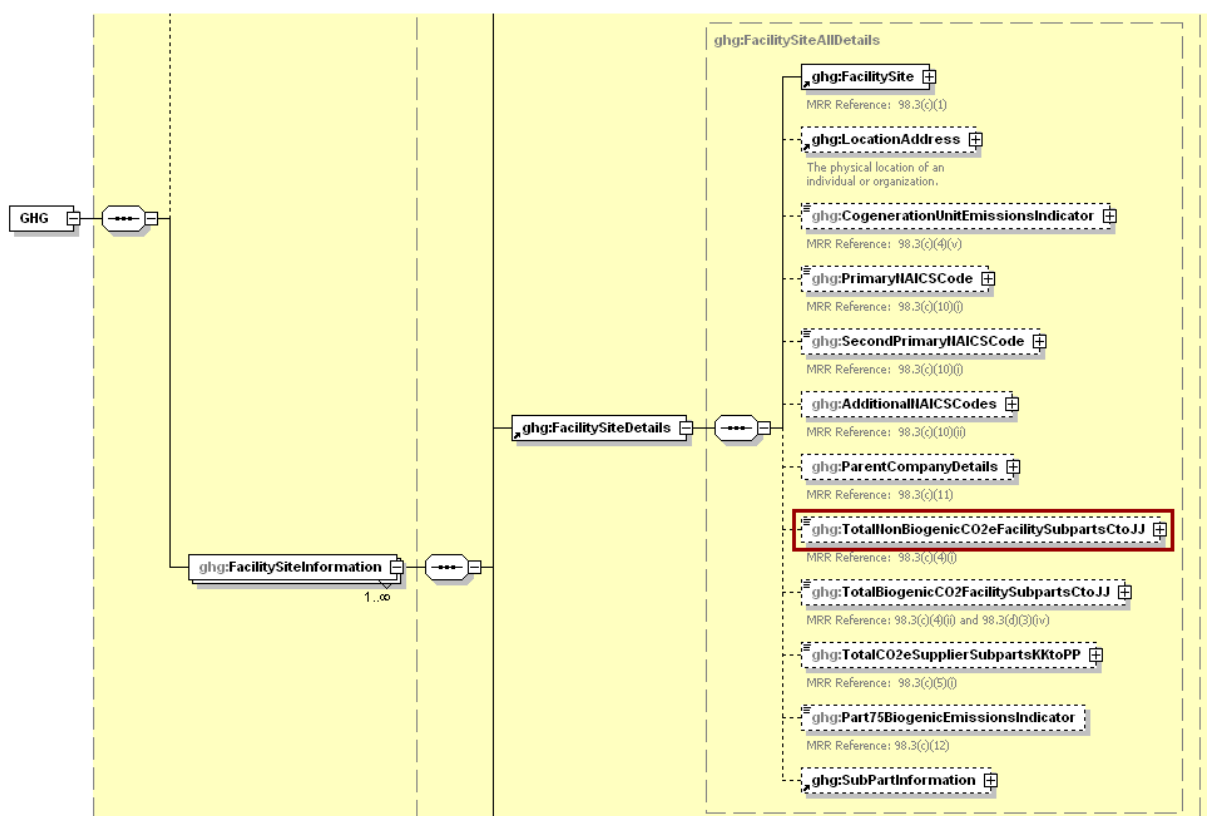
Add the total CO_2e value for subpart HH in metric tons to the total CO_2e emissions (excluding biogenic CO_2) aggregated across all source category subparts associated with the facility according to the following guidelines:

- For landfills without landfill gas collection systems, multiply the annual CH_4 emissions in metric tons (calculated from Equation HH-5 and rounded to two decimal places) by the Global Warming Potential for methane (21) to arrive at the total CO_2e value.

- For landfills with landfill gas collection systems, multiply the larger of the following by the Global Warming Potential for methane (21) to arrive at the total CO_2e value:
  - CH_4 emissions from the landfill in the reporting year in metric tons (calculated from Equation HH-6 and rounded to two decimal places).
  - CH_4 emissions from the landfill in the reporting year in metric tons (calculated from Equation HH-8 and rounded to two decimal places).

Table 13
Facility Level Roll-up Emissions XML Data Elements

Data Element Name	Description
TotalNonBiogenicCO2eFacilitySubpartsCtoJJ	Add the total CO_2e value for subpart HH in metric tons to the total CO_2e emissions (excluding biogenic CO_2) aggregated across all source category subparts associated with the facility according to the guidelines above.
TotalNonBiogenicCO2eFacilitySubpartsCtoJJ.massUOM	Metric Tons

Figure 29
Sample XML Excerpt for Facility Level Roll-up Emissions

```
<ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric
Tons">84000</ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ>
<ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">0</ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ>
<ghg:TotalCO2eSupplierSubpartsKKtoPP massUOM="Metric Tons">0</ghg:TotalCO2eSupplierSubpartsKKtoPP>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas emissions data.

Appendix A

Legend for Tables

Blue = parent element

Legend for XML Schema Diagrams

Red box = relevant for reporting

The following XML symbol "0..∞" means that multiple occurrences for the parent element can be reported:
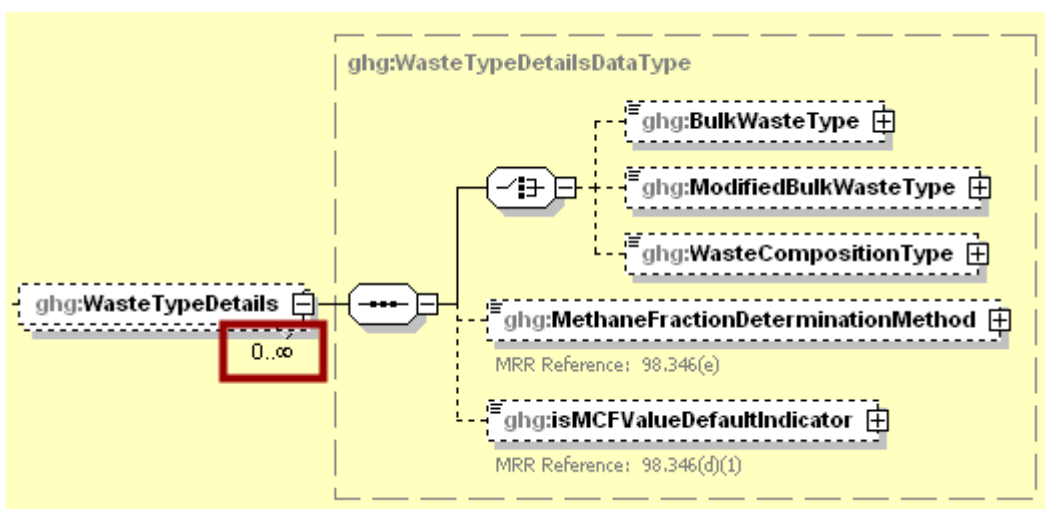
The following XML symbol for "or" means that only one of the data elements following the sign can be reported for the current instance of the parent element:
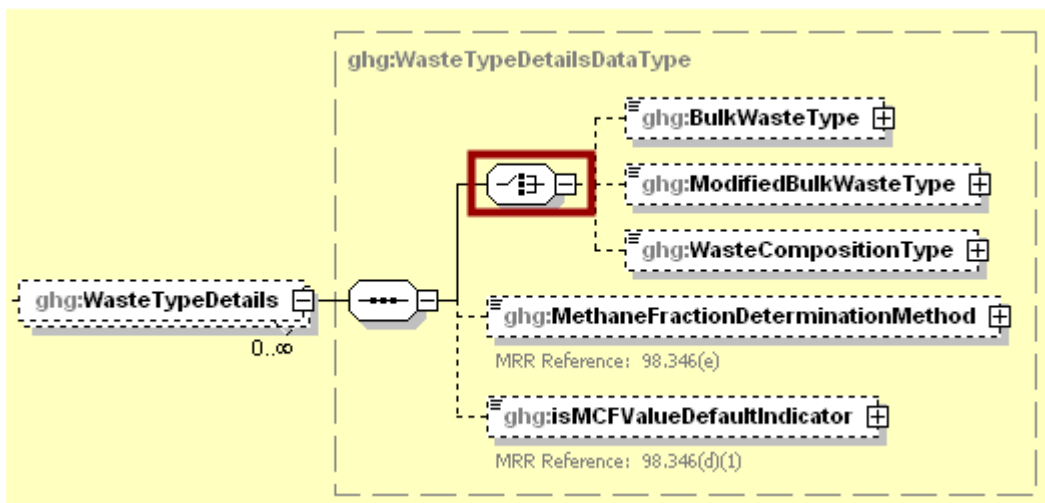
Appendix B

Sample XML Document for Subpart HH

(Note: Data values do not reflect an actual facility's emissions.)

```
<ghg:GHG xmlns="http://www.ccdsupport.com/schema/ghg">
  <ghg:FacilitySiteInformation>
    <ghg:CertificationStatement>The designated representative or alternate designated representative must sign (i.e., agree to)
this certification statement. If you are an agent and you click on  "SUBMIT", you are not agreeing to the certification statement,
but are submitting the certification statement on behalf of the designated  representative or alternate designated representative
who is agreeing to the certification statement. An agent is only authorized to make the electronic submission on behalf of the
designated representative, not to sign (i.e., agree to) the certification statement.</ghg:CertificationStatement>
    <ghg:ReportingYear>2010</ghg:ReportingYear>
    <ghg:FacilitySiteDetails>
        <ghg:FacilitySite>
                <ghg:FacilitySiteIdentifier>524297</ghg:FacilitySiteIdentifier>
                <ghg:FacilitySiteName>Test Facility HH</ghg:FacilitySiteName>
        </ghg:FacilitySite>
        <ghg:LocationAddress>
        <ghg:LocationAddressText>1 Main St.</ghg:LocationAddressText>
        <ghg:LocalityName>Charlottesville</ghg:LocalityName>
        <ghg:StateIdentity>
                <ghg:StateCode>VA</ghg:StateCode>
        </ghg:StateIdentity>
                <ghg:AddressPostalCode>22911</ghg:AddressPostalCode>
        </ghg:LocationAddress>
        <ghg:CogenerationUnitEmissionsIndicator>N</ghg:CogenerationUnitEmissionsIndicator>
        <ghg:PrimaryNAICSCode>562212</ghg:PrimaryNAICSCode>
        <ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric
Tons">84000</ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ>
        <ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">0</ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ>
        <ghg:TotalCO2eSupplierSubpartsKKtoPP massUOM="Metric Tons">0</ghg:TotalCO2eSupplierSubpartsKKtoPP>
        <ghg:SubPartInformation>
                <ghg:SubPartHH>
                        <ghg:GHGasInfoDetails>
                                <ghg:GHGasName>Methane</ghg:GHGasName>
                                <ghg:GHGasQuantity massUOM="Metric Tons">
                                  <ghg:CalculatedValue>4000</ghg:CalculatedValue>
                                </ghg:GHGasQuantity>
                        </ghg:GHGasInfoDetails>
                        <ghg:LandFillOpen>Y</ghg:LandFillOpen>
                        <ghg:EstimatedYearLandFillClosure>2015</ghg:EstimatedYearLandFillClosure>
                        <ghg:LeachRateRecirculationFrequency>Used several times a year for the past 10
years</ghg:LeachRateRecirculationFrequency>
                        <ghg:LeachRateRecirculationIndicator>Y</ghg:LeachRateRecirculationIndicator>
                        <ghg:ScalesIndicator>Y</ghg:ScalesIndicator>
                        <ghg:LandFilledGasCollectionSystemIndicator>Y</ghg:LandFilledGasCollectionSystemIndicator>
                        <ghg:PassiveVentFlareIndicator>Y</ghg:PassiveVentFlareIndicator>
                        <ghg:LandfillCapacity massUOM="Metric Tons">
                                <ghg:MeasureValue>123456789</ghg:MeasureValue>
                        </ghg:LandfillCapacity>
                        <ghg:LandfillSurfaceAreacContainingWaste areaUOM="Square Meters">
                                <ghg:MeasureValue>963852741</ghg:MeasureValue>
                        </ghg:LandfillSurfaceAreacContainingWaste>
                        <ghg:CoverTypeDetails>
                                <ghg:CoverTypeName>Organic cover</ghg:CoverTypeName>
                        </ghg:CoverTypeDetails>
                        <ghg:ActiveAerationDetails>
                                <ghg:AerationBlowerCapacity flowUOM="scfm">
                                        <ghg:MeasureValue>741852963</ghg:MeasureValue>
                                </ghg:AerationBlowerCapacity>
                                <ghg:LandfillFractionAffectedbyAeration fractionUOM="fraction (number between 0 and
1)">
                                        <ghg:MeasureValue>0.25</ghg:MeasureValue>
                                </ghg:LandfillFractionAffectedbyAeration>
                                <ghg:AerationBlowerOperationsHours timeUOM="Hours">
                                        <ghg:MeasureValue>123</ghg:MeasureValue>
                                </ghg:AerationBlowerOperationsHours>
                                <ghg:OtherMCFFactors>Factors X and Y</ghg:OtherMCFFactors>
                                <ghg:AdditionalDescription>Description Z</ghg:AdditionalDescription>
                        </ghg:ActiveAerationDetails>
                        <ghg:CurrentWasteQuantityDetails>
                                <ghg:CurrentAnnualWasteQuantityMethod>Used scales to weigh loads before off-loading
                                and either used scales to weigh individual loads after off-loading or used representative
                                tare vehicle/container weights</ghg:CurrentAnnualWasteQuantityMethod>
```

```
<ghg:YearWasteDetails>
        <ghg:YearWasteDetail>
                <ghg:YearWasteDisposed>2010</ghg:YearWasteDisposed>
                <ghg:CurrentAnnualWasteQuantity>
                        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
                        <ghg:NumberofTimesSubstituted>10</ghg:NumberofTimesSubstituted>
                </ghg:CurrentAnnualWasteQuantity>
                <ghg:WasteTypeDetails>
                        <ghg:ModifiedBulkWasteType>bulk MSW waste (excluding inerts and C&amp;D waste)</ghg:ModifiedBulkWasteType>
                        <ghg:MethaneFractionDeterminationMethod>measured</ghg:MethaneFractionDeterminationMethod>
                        <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDefaultIndicator>
                </ghg:WasteTypeDetails>
        </ghg:YearWasteDetail>
</ghg:YearWasteDetails>
</ghg:CurrentWasteQuantityDetails>
<ghg:PriorWasteQuantityDetails>
        <ghg:PriorAnnualWasteQuantityMethod>Y</ghg:PriorAnnualWasteQuantityMethod>
        <ghg:PriorYearWasteDetails>
                <ghg:YearWasteDetail>
                        <ghg:YearWasteDisposed>2009</ghg:YearWasteDisposed>
                        <ghg:CurrentAnnualWasteQuantity>
                                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
                                <ghg:NumberofTimesSubstituted>20</ghg:NumberofTimesSubstituted>
                        </ghg:CurrentAnnualWasteQuantity>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>food waste</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDefaultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>wood and straw</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDefaultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>diapers</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDefaultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>sewage sludge</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDefaultIndicator>
                        </ghg:WasteTypeDetails>
                        <ghg:WasteTypeDetails>
                                <ghg:WasteCompositionType>inerts</ghg:WasteCompositionType>
                                <ghg:MethaneFractionDeterminationMethod>measured</ghg:MethaneFractionDeterminationMethod>
                                <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDefaultIndicator>
                        </ghg:WasteTypeDetails>
                </ghg:YearWasteDetail>
        </ghg:PriorYearWasteDetails>
        <ghg:PriorYearWasteDetails>
                <ghg:YearWasteDetail>
                        <ghg:YearWasteDisposed>2008</ghg:YearWasteDisposed>
                        <ghg:CurrentAnnualWasteQuantity>
                                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
                                <ghg:NumberofTimesSubstituted>30</ghg:NumberofTimesSubstituted>
                        </ghg:CurrentAnnualWasteQuantity>
```

```
                                    <ghg:WasteTypeDetails>
                                            <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                                            <ghg:MethaneFractionDeterminationMethod>measured</g
                                    hg:MethaneFractionDeterminationMethod>
                                            <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDefa
                                    ultIndicator>
                                    </ghg:WasteTypeDetails>
                            </ghg:YearWasteDetail>
                    </ghg:PriorYearWasteDetails>
                    <ghg:PriorYearWasteDetails>
                            <ghg:YearWasteDetail>
                                    <ghg:YearWasteDisposed>2007</ghg:YearWasteDisposed>
                                    <ghg:CurrentAnnualWasteQuantity>
                                            <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicato
                                    r>
                                            <ghg:NumberofTimesSubstituted>40</ghg:NumberofTimes
                                    Substituted>
                                    </ghg:CurrentAnnualWasteQuantity>
                                    <ghg:WasteTypeDetails>
                                            <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                                            <ghg:MethaneFractionDeterminationMethod>default</ghg:
                                    MethaneFractionDeterminationMethod>
                                            <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDefa
                                    ultIndicator>
                                    </ghg:WasteTypeDetails>
                            </ghg:YearWasteDetail>
                    </ghg:PriorYearWasteDetails>
                    <ghg:PriorYearWasteDetails>
                            <ghg:YearWasteDetail>
                                    <ghg:YearWasteDisposed>2006</ghg:YearWasteDisposed>
                                    <ghg:CurrentAnnualWasteQuantity>
                                            <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicato
                                    r>
                                            <ghg:NumberofTimesSubstituted>50</ghg:NumberofTimes
                                    Substituted>
                                    </ghg:CurrentAnnualWasteQuantity>
                                    <ghg:WasteTypeDetails>
                                            <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                                            <ghg:MethaneFractionDeterminationMethod>default</ghg:
                                    MethaneFractionDeterminationMethod>
                                            <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDefa
                                    ultIndicator>
                                    </ghg:WasteTypeDetails>
                            </ghg:YearWasteDetail>
                    </ghg:PriorYearWasteDetails>
                    <ghg:PriorYearWasteDetails>
                            <ghg:YearWasteDetail>
                                    <ghg:YearWasteDisposed>2005</ghg:YearWasteDisposed>
                                    <ghg:CurrentAnnualWasteQuantity>
                                            <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicato
                                    r>
                                            <ghg:NumberofTimesSubstituted>60</ghg:NumberofTimes
                                    Substituted>
                                    </ghg:CurrentAnnualWasteQuantity>
                                    <ghg:WasteTypeDetails>
                                            <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                                            <ghg:MethaneFractionDeterminationMethod>default</ghg:
                                    MethaneFractionDeterminationMethod>
                                            <ghg:isMCFValueDefaultIndicator>Y</ghg:isMCFValueDefa
                                    ultIndicator>
                                    </ghg:WasteTypeDetails>
                            </ghg:YearWasteDetail>
                    </ghg:PriorYearWasteDetails>
                    <ghg:PriorYearWasteDetails>
                            <ghg:YearWasteDetail>
                                    <ghg:YearWasteDisposed>2004</ghg:YearWasteDisposed>
                                    <ghg:CurrentAnnualWasteQuantity>
                                            <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicato
                                    r>
                                            <ghg:NumberofTimesSubstituted>70</ghg:NumberofTimes
                                    Substituted>
                                    </ghg:CurrentAnnualWasteQuantity>
                                    <ghg:WasteTypeDetails>
                                            <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                                            <ghg:MethaneFractionDeterminationMethod>default</ghg:
                                    MethaneFractionDeterminationMethod>
                                            <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDefa
                                    ultIndicator>
                                    </ghg:WasteTypeDetails>
                            </ghg:YearWasteDetail>
                    </ghg:PriorYearWasteDetails>
                    <ghg:PriorYearWasteDetails>
```

```
<ghg:YearWasteDetail>
<ghg:YearWasteDisposed>2003</ghg:YearWasteDisposed>
        <ghg:CurrentAnnualWasteQuantity>
                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicato
                r>
                <ghg:NumberofTimesSubstituted>80</ghg:NumberofTimes
                Substituted>
        </ghg:CurrentAnnualWasteQuantity>
        <ghg:WasteTypeDetails>
                <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                <ghg:MethaneFractionDeterminationMethod>default</ghg:
                MethaneFractionDeterminationMethod>
                <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDefa
                ultIndicator>
        </ghg:WasteTypeDetails>
</ghg:YearWasteDetail>
</ghg:PriorYearWasteDetails>
<ghg:PriorYearWasteDetails>
        <ghg:YearWasteDetail>
                <ghg:YearWasteDisposed>2002</ghg:YearWasteDisposed>
                <ghg:CurrentAnnualWasteQuantity>
                        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicato
                        r>
                        <ghg:NumberofTimesSubstituted>90</ghg:NumberofTimes
                        Substituted>
                </ghg:CurrentAnnualWasteQuantity>
                <ghg:WasteTypeDetails>
                        <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                        <ghg:MethaneFractionDeterminationMethod>default</ghg:
                        MethaneFractionDeterminationMethod>
                        <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDefa
                        ultIndicator>
                </ghg:WasteTypeDetails>
        </ghg:YearWasteDetail>
</ghg:PriorYearWasteDetails>
<ghg:PriorYearWasteDetails>
        <ghg:YearWasteDetail>
                <ghg:YearWasteDisposed>2001</ghg:YearWasteDisposed>
                <ghg:CurrentAnnualWasteQuantity>
                        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicato
                        r>
                        <ghg:NumberofTimesSubstituted>100</ghg:NumberofTim
                        esSubstituted>
                </ghg:CurrentAnnualWasteQuantity>
                <ghg:WasteTypeDetails>
                        <ghg:BulkWasteType>Bulk waste</ghg:BulkWasteType>
                        <ghg:MethaneFractionDeterminationMethod>default</ghg:
                        MethaneFractionDeterminationMethod>
                        <ghg:isMCFValueDefaultIndicator>N</ghg:isMCFValueDefa
                        ultIndicator>
                </ghg:WasteTypeDetails>
        </ghg:YearWasteDetail>
</ghg:PriorYearWasteDetails>
<ghg:TippingReceiptsDetails>
        <ghg:TippingReceiptsUsedToDetermineQuantities>Y</ghg:TippingReceiptsUsed
        ToDetermineQuantities>
        <ghg:TippingReceiptsPeriodStart>1991</ghg:TippingReceiptsPeriodStart>
        <ghg:TippingReceiptsPeriodEnd>2000</ghg:TippingReceiptsPeriodEnd>
</ghg:TippingReceiptsDetails>
<ghg:HistoricalWasteQuantityDetails>
        <ghg:HistoricalWasteQuantityMethod>Method #1:  Assume all prior year's
        waste disposal quantities are the same as the waste quantity in the first year for
        which waste quantities are available.</ghg:HistoricalWasteQuantityMethod>
        <ghg:HistoricalMethodStartYear>1981</ghg:HistoricalMethodStartYear>
        <ghg:HistoricalMethodEndYear>1990</ghg:HistoricalMethodEndYear>
        <ghg:HistoricalMethodReason>This was the best method to
        use.</ghg:HistoricalMethodReason>
</ghg:HistoricalWasteQuantityDetails>
</ghg:PriorWasteQuantityDetails>
<ghg:GasCollectionSystemDetails>
        <ghg:AnnualVolumeFGCollectedGasVolumetricFlow volUOM="scf">
                <ghg:MeasureValue>963852741</ghg:MeasureValue>
                <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
                <ghg:NumberofTimesSubstituted>100</ghg:NumberofTimesSubstituted>
        </ghg:AnnualVolumeFGCollectedGasVolumetricFlow>
        <ghg:AnnualAverageMethodDetails>
                <ghg:AnnualAverageMethaneConcentration percentUOM="Number (between 0
                and 100)">
                        <ghg:MeasureValue>50</ghg:MeasureValue>
                        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
                </ghg:AnnualAverageMethaneConcentration>
                <ghg:NumberofDaysSubstituted>60</ghg:NumberofDaysSubstituted>
```

```
                        </ghg:AnnualAverageMethodDetails>
                        <ghg:isTemperatureIncorporatedIndicator>N</ghg:isTemperatureIncorporatedIndicator>
                        <ghg:isPressureIncorporatedIndicator>N</ghg:isPressureIncorporatedIndicator>
                        <ghg:isLFGFlowWetBasisIndicator>Y</ghg:isLFGFlowWetBasisIndicator>
                        <ghg:isMethaneConcentrationWetBasisIndicator>N</ghg:isMethaneConcentrationWetBasi
                        sIndicator>
                        <ghg:GasCollectionMonthlyDetails>
                                <ghg:MonthName>January</ghg:MonthName>
                                <ghg:AverageTemperature tempUOM="Rankine">
                                        <ghg:MeasureValue>560</ghg:MeasureValue>
                                </ghg:AverageTemperature>
                                <ghg:AveragePressure pressureUOM="atmosphere">
                                        <ghg:MeasureValue>100</ghg:MeasureValue>
                                        </ghg:AveragePressure>
                                <ghg:AverageMoistureContent fractionUOM="fraction (number between 0 and
                                1)">
                                        <ghg:MeasureValue>0.1</ghg:MeasureValue>
                                </ghg:AverageMoistureContent>
                        </ghg:GasCollectionMonthlyDetails>
                        <ghg:GasCollectionMonthlyDetails>
                                <ghg:MonthName>February</ghg:MonthName>
                                <ghg:AverageTemperature tempUOM="Rankine">
                                        <ghg:MeasureValue>570</ghg:MeasureValue>
                                </ghg:AverageTemperature>
                                <ghg:AveragePressure pressureUOM="atmosphere">
                                        <ghg:MeasureValue>110</ghg:MeasureValue>
                                </ghg:AveragePressure>
                                <ghg:AverageMoistureContent fractionUOM="fraction (number between 0 and
                                1)">
                                        <ghg:MeasureValue>0.2</ghg:MeasureValue>
                                </ghg:AverageMoistureContent>
                        </ghg:GasCollectionMonthlyDetails>
                        <ghg:GasCollectionMonthlyDetails>
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