Greenhouse Gas Reporting Program

XML Reporting Instructions for Subpart N - Glass Production

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, 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 for Subpart N Glass Production and overall total Subpart N emissions for a facility 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, the data element "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 entered 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

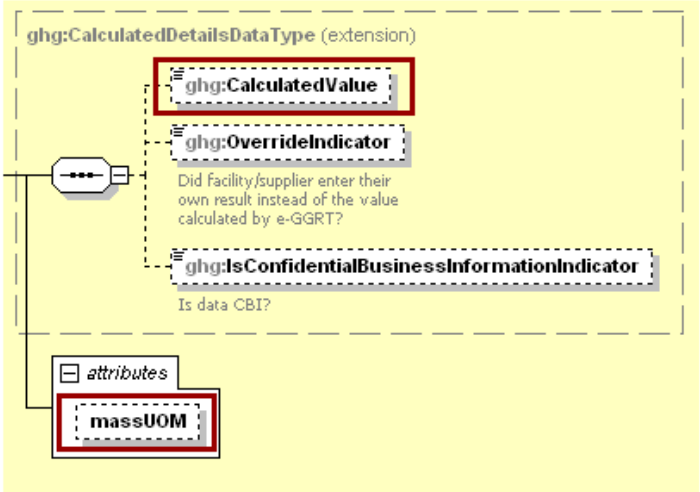


Figure 2
Sample Measured Value Schema Diagram

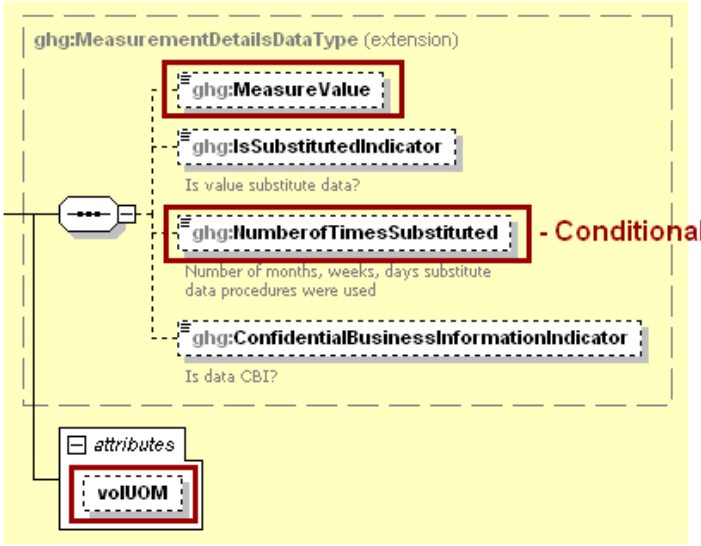
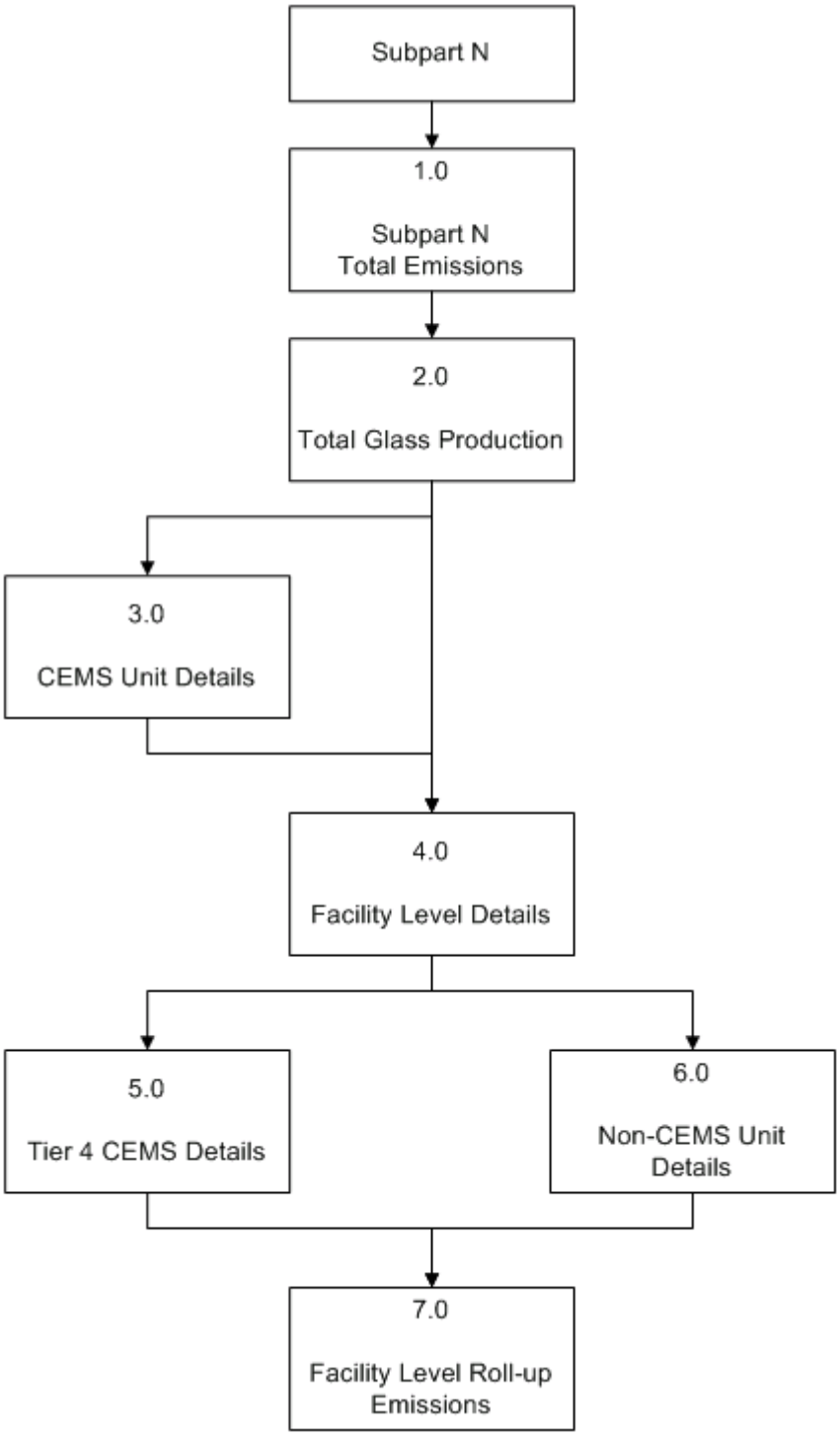


Figure 3
Subpart N Reporting Diagram



The XML schema includes the following areas for reporting for Subpart N as shown in Figure 3:

1.0 Subpart N Total Emissions: includes the total annual CO2 emissions for greenhouse gases required to be reported.
2.0 Total Glass Production: includes the total annual glass production quantity for the facility.
3.0 CEMS Unit Details: includes information on unit identification and details if using CEMS.

4.0 Facility Level Details: includes information on carbonate-based raw materials and the number of furnaces in the facility.
5.0 Tier 4 CEMS Details: includes information on each CEMS monitoring location and emissions (CO2, CH4, N2O, and biogenic CO2) details.
6.0 Non-CEMS Unit Details: includes information on unit identification, emissions and glass production if not using CEMS.
7.0 Facility Level Roll-up Emissions: includes information on how to report total emissions for CO_2e (excluding biogenic CO_2) and total biogenic CO_2.

The following terminology is used throughout this document:

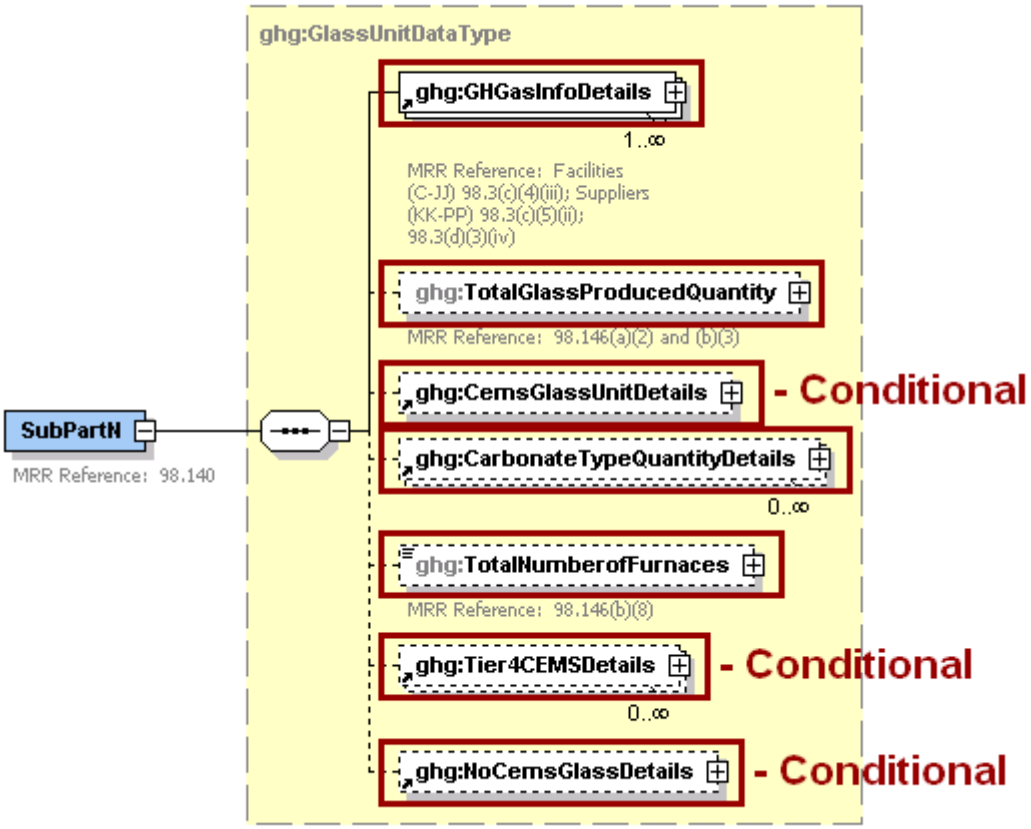
- Namespace: A namespace uniquely identifies a set of names such that there is no ambiguity when objects having different origins but the same names are mixed together.
- Markup Language: A way to combine text and extra information to show the structure and layout of a document. This information is expressed 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 quantity 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., product-level, supplier-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 GHGs 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.

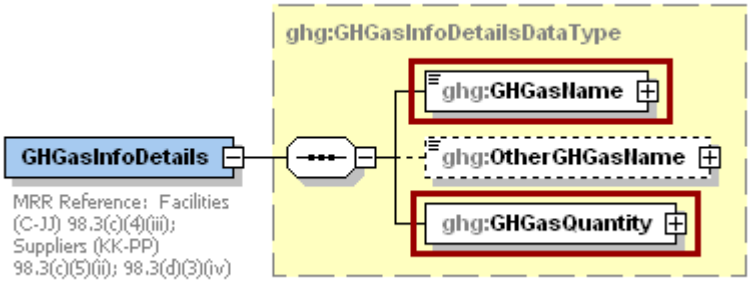
Figure 4
Subpart N Schema Diagram



1.0 Subpart N Total Emissions

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

Figure 5
Greenhouse Gas Information Details Schema Diagram



For Subpart N, report total emissions for carbon dioxide (excluding biogenic CO_2), biogenic carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). For greenhouse gas quantity, report the calculated value and mass unit of measure (metric tons) only according to the following guidelines:

- For carbon dioxide, report the sum of the following:
  - The total annual CO_2 process emissions from each furnace (Equation N-1) in metric tons rounded to one decimal place for each non-CEMS unit.
  - The total annual CO_2 mass emissions measured by the CEMS in metric tons rounded to one decimal place minus the total annual biogenic CO_2 mass emissions in metric tons rounded to one decimal place (the difference of the total CO_2 monitored by the CEMS and the total biogenic CO_2) for each CEMS monitoring location (CML).
- For biogenic carbon dioxide, report the sum of the total annual biogenic CO_2 mass emissions in metric tons rounded to one decimal place for each CML.
- For methane, report the sum of the total CH_4 emissions in metric tons rounded to two decimal places for each CML.
- For nitrous oxide, report the sum of the total N_2O emissions in metric tons rounded to three decimal places for each CML.

Table 1
Greenhouse Gas Information Details 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 greenhouse gas. See list of allowable values: Carbon Dioxide Biogenic Carbon dioxide Methane Nitrous Oxide
GHGasQuantity	A collection of data elements that quantify the annual emissions from this source category. Report the calculated value only according to the guidelines above..
GHGasQuantity.massUOM	Metric Tons

Figure 6
Sample XML Excerpt for Greenhouse Gas Information Details

```
<ghg:SubPartN>
        <ghg:GHGasInfoDetails>
                <ghg:GHGasName>Biogenic Carbon dioxide</ghg:GHGasName>
                <ghg:GHGasQuantity massUOM="Metric Tons">
                        <ghg:CalculatedValue>500</ghg:CalculatedValue>
                </ghg:GHGasQuantity>
        </ghg:GHGasInfoDetails>
        <ghg:GHGasInfoDetails>
                <ghg:GHGasName>Methane</ghg:GHGasName>
                <ghg:GHGasQuantity massUOM="Metric Tons">
                        <ghg:CalculatedValue>111</ghg:CalculatedValue>
                </ghg:GHGasQuantity>
        </ghg:GHGasInfoDetails>
        <ghg:GHGasInfoDetails>
                <ghg:GHGasName>Nitrous Oxide</ghg:GHGasName>
                <ghg:GHGasQuantity massUOM="Metric Tons">
                        <ghg:CalculatedValue>11</ghg:CalculatedValue>
                </ghg:GHGasQuantity>
        </ghg:GHGasInfoDetails>
        <ghg:GHGasInfoDetails>
                <ghg:GHGasName>Carbon Dioxide</ghg:GHGasName>
                <ghg:GHGasQuantity massUOM="Metric Tons">
                        <ghg:CalculatedValue>249500</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 Total Glass Production

This section provides a description of how to report Subpart N information for total glass production for the facility.

Figure 7
Total Glass Production Schema Diagram

For Subpart N, report the total annual quantity of glass produced from all furnaces combined in short tons [98.146(a)(2) and 98.146(b)(3)].

Table 2
Total Glass Production XML Data Elements

Data Element Name	Description
TotalGlassProducedQuantity	A collection of data elements containing information on the total quantity of glass produced across all furnaces. Report the measured value and mass unit of measure only.
TotalGlassProducedQuantity.massUOM	Short Tons

Figure 8
Sample XML Excerpt for Total Glass Production

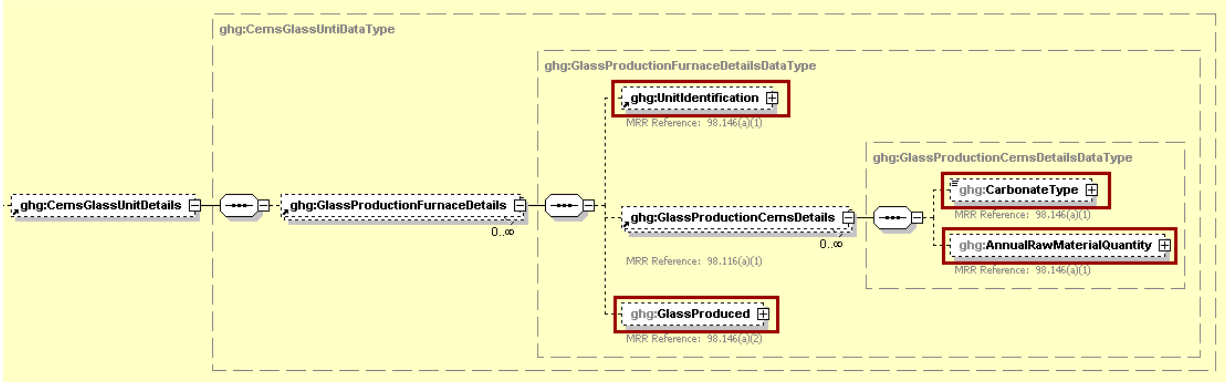
```
<ghg:TotalGlassProducedQuantity massUOM="tons">
        <ghg:MeasureValue>30000</ghg:MeasureValue>
</ghg:TotalGlassProducedQuantity>
```

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

3.0 CEMS Unit Details

This section describes unit information that must be reported for units if a continuous emissions monitoring system (CEMS) was in use during the reporting year.

Figure 9
CEMS Unit Details Schema Diagram



Subpart N requires the following identification information for each continuous glass melting furnace that had emissions monitored using a CEMS [98.146(a)]:

- A unique unit name or identifier (e.g., a unit ID number).
- An optional unit description or label.
- The type of unit: "Continuous Glass Melting Furnace".

For each continuous glass melting furnace monitored by CEMS in your facility, Subpart N requires you to report the following information:

- The type of each carbonate-based raw material charged to each continuous glass melting furnace from the following list [98.146(a)]:
  - Limestone
  - Dolomite
  - Sodium carbonate
  - Barium carbonate
  - Potassium carbonate
  - Lithium carbonate
  - Strontium carbonate
- The annual quantity of each carbonate-based raw material charged to each furnace in short tons [98.146(a)(1)].
- The annual quantity of glass produced by each continuous glass melting furnace in short tons [98.146(a)(2)].

Table 3
CEMS Unit Details XML Data Elements

Data Element Name	Description
CemsGlassUnitDetails	
GlassProductionFurnaceDetails	
UnitIdentification	A collection of data elements containing the identity of each continuous glass melting furnace that uses a CEMS to measure CO_2 emissions. It includes the unit ID, a brief optional description and the unit type: Continuous Glass Melting Furnace
GlassProductionCemsDetails	
CarbonateType	Each carbonate-based raw material charged to the specified continuous glass melting furnace. See list of allowable values: Limestone Dolomite Sodium carbonate Barium carbonate Potassium carbonate Lithium carbonate Strontium carbonate
AnnualRawMaterialQuantity	A collection of data elements containing information on the annual quantity of each carbonate-based raw material charged to the specified continuous glass melting furnace. Report the measured and mass unit of measure only.
AnnualRawMaterialQuantity.massUOM	Short Tons
GlassProduced	A collection of data elements containing information on the annual quantity of glass produced by the specified glass melting furnace. Report the measured value and mass unit of measure only.
GlassProduced.massUOM	Short Tons

Figure 10
Sample XML Excerpt for CEMS Unit Details

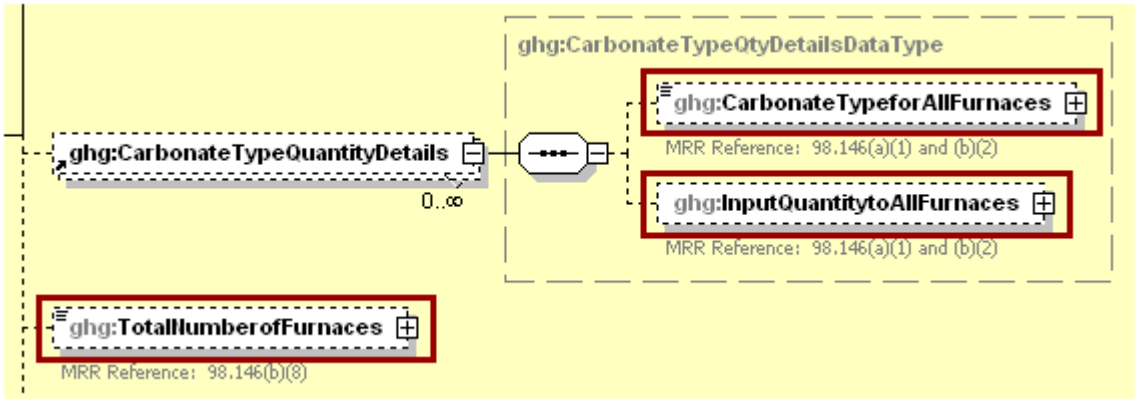
```
<ghg:CemsGlassUnitDetails>
    <ghg:GlassProductionFurnaceDetails>
        <ghg:UnitIdentification>
            <ghg:UnitName>002- CEMS</ghg:UnitName>
            <ghg:UnitDescription>CEMS unit</ghg:UnitDescription>
            <ghg:UnitType>Continuous Glass Melting Furnace</ghg:UnitType>
        </ghg:UnitIdentification>
        <ghg:GlassProductionCemsDetails>
            <ghg:CarbonateType>Limestone</ghg:CarbonateType>
            <ghg:AnnualRawMaterialQuantity massUOM="tons">
                <ghg:MeasureValue>5000</ghg:MeasureValue>
            </ghg:AnnualRawMaterialQuantity>
        </ghg:GlassProductionCemsDetails>
        <ghg:GlassProductionCemsDetails>
            <ghg:CarbonateType>Barium carbonate</ghg:CarbonateType>
            <ghg:AnnualRawMaterialQuantity massUOM="Short Tons">
                <ghg:MeasureValue>6000</ghg:MeasureValue>
            </ghg:AnnualRawMaterialQuantity>
        </ghg:GlassProductionCemsDetails>
        <ghg:GlassProduced massUOM="Short Tons">
            <ghg:MeasureValue>20000</ghg:MeasureValue>
        </ghg:GlassProduced>
    </ghg:GlassProductionFurnaceDetails>
</ghg:CemsGlassUnitDetails>
```

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

4.0 Facility Level Details

This section describes information that must be reported for Subpart N at the facility level.

Figure 11
Facility Level Details Schema Diagram



Subpart N requires the following information be reported:

- The type of each carbonate-based raw material for all furnaces combined from the following list [98.146(a) and 98.146(b)].
  - Limestone
  - Dolomite
  - Sodium carbonate
  - Barium carbonate
  - Potassium carbonate
  - Lithium carbonate
  - Strontium carbonate
- The annual quantity of each carbonate-based raw material for all furnaces combined in short tons [98.146(a)(1) and (b)(2)].
- The total number of continuous glass melting furnaces [98.146(b)(8)].

Table 4
Facility Level Details XML Data Elements

Data Element Name	Description
CarbonateTypeQuantityDetails	
CarbonateTypeforAllFurnaces	Each carbonate-based raw material charged to a continuous glass melting furnace. See list of allowable values: LimeStone Dolomite SodiumCarbonate BariumCarbonate StrontiumCarbonate LithiumCarbonate PotassiumCarbonate

Data Element Name	Description
InputQuantitytoAllFurnaces	A collection of data elements containing information on the annual quantity of the specified carbonate-based raw material. Report the measured value and mass unit of measure only.
InputQuantitytoAllFurnaces.massUOM	Short Tons
TotalNumberofFurnaces	The total number of continuous glass melting furnaces.

Figure 12
Sample XML Excerpt for Facility Level Details

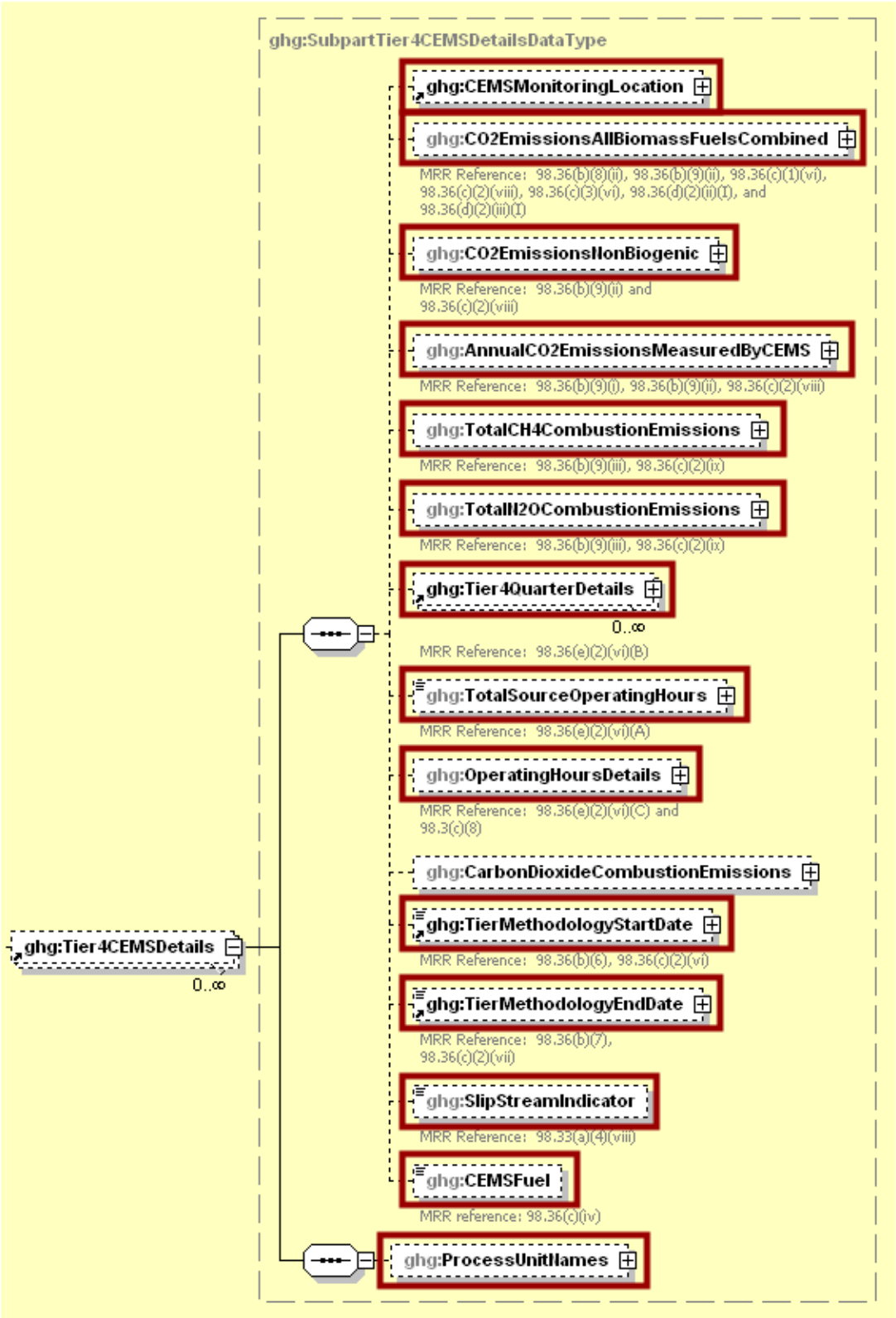
```
<ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeforAllFurnaces>LimeStone</ghg:CarbonateTypeforAllFurnaces>
        <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                <ghg:MeasureValue>1000</ghg:MeasureValue>
        </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeforAllFurnaces>Dolomite</ghg:CarbonateTypeforAllFurnaces>
        <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                <ghg:MeasureValue>1100</ghg:MeasureValue>
        </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeforAllFurnaces>SodiumCarbonate</ghg:CarbonateTypeforAllFurnaces>
        <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                <ghg:MeasureValue>1200</ghg:MeasureValue>
        </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeforAllFurnaces>BariumCarbonate</ghg:CarbonateTypeforAllFurnaces>
        <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                <ghg:MeasureValue>1300</ghg:MeasureValue>
        </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeforAllFurnaces>StrontiumCarbonate</ghg:CarbonateTypeforAllFurnaces>
        <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                <ghg:MeasureValue>1400</ghg:MeasureValue>
        </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeforAllFurnaces>LithiumCarbonate</ghg:CarbonateTypeforAllFurnaces>
        <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                <ghg:MeasureValue>1500</ghg:MeasureValue>
        </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeforAllFurnaces>PotassiumCarbonate</ghg:CarbonateTypeforAllFurnaces>
        <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                <ghg:MeasureValue>1600</ghg:MeasureValue>
        </ghg:InputQuantitytoAllFurnaces>
</ghg:CarbonateTypeQuantityDetails>
<ghg:TotalNumberofFurnaces>2</ghg:TotalNumberofFurnaces>
```

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

5.0 Tier 4 CEMS Details

This section includes information to be reported for each CEMS monitoring location (CML).

Figure 13
Tier 4 CEMS Details Schema Diagram



For Subpart N, information on each CEMS monitoring location (CML) is required including the name, an optional description and the configuration type. For each CML identified by the facility, the facility must specify the configuration type from the following list [98.176(e)]:

- Single industrial process or process unit that exhausts to a dedicated stack.
- Multiple industrial processes or process units share a common stack.
- Industrial process or process unit shares a common stack with a Tier 4 stationary fuel combustion unit.

For each CEMS monitoring location identified, the following emissions data must be reported:

- The total annual biogenic CO_2 mass emissions from combustion of all biomass fuels combined [98.36(b)(8)(ii)].
- The total annual non-biogenic CO_2 mass emissions (i.e., CO_2 mass emissions from fossil fuels, sorbent use, and process emissions) [98.36(b)(9)(ii)].
- The total annual CO_2 mass emissions measured by the CEMS [98.36(b)(9)(i)-(ii)].
- The total annual CH_4 mass emissions derived from Equation C-10, in metric tons CH_4 [98.36(b)(9)(iii), 98.36(c)(2)(ix)].
- The total annual N_2O mass emissions derived from Equation C-10, in metric tons N_2O [98.36(b)(9)(iii), 98.36(c)(2)(ix)].

Figure 14
Tier 4 CEMS Location and Emission Details Schema Diagram

Table 5
Tier 4 CEMS Location and Emission Details XML Data Elements

Data Element Name	Description
Tier4CEMSDetails	A collection of data elements containing information on emissions from combustion sources monitored with Tier 4 CEMS methodology.
CEMSMonitoringLocation	A collection of data elements containing information on each CEMS monitoring location (CML). It includes the name, an optional description and the configuration type. See the list of allowable configuration types: Single process/process unit exhausts to dedicated stack Multiple processes/process units share common stack Process/stationary combustion units share common stack
CO2EmissionsAllBiomassFuelsCombined	A collection of data elements containing information on the total annual biogenic CO_2 mass emissions for the specified CML. Report the calculated value and mass unit of measure only.
CO2EmissionsAllBiomassFuelsCombined.massUOM	Metric Tons
CO2EmissionsNonBiogenic	A collection of data elements containing information on the total annual non-biogenic CO_2 mass emissions (includes fossil fuel, sorbent, and process CO_2 emissions) for the specified CML. Report the calculated value and mass unit of measure only.
CO2EmissionsNonBiogenic.massUOM	Metric Tons
AnnualCO2EmissionsMeasuredByCEMS	A collection of data elements containing information on the total annual CO_2 mass emissions measured by the CEMS at the specified monitoring location. Report the calculated value and mass unit of measure only.
AnnualCO2EmissionsMeasuredByCEMS.massUOM	Metric Tons
TotalCH4CombustionEmissions	A collection of data elements containing information on the annual CH_4 mass emissions from combustion in the CML configuration during the reporting year calculated using Equation C-10 expressed in mass of CH_4. Report the calculated value and mass unit of measure only.
TotalCH4CombustionEmissions.massUOM	Metric Tons
TotalN2OCombustionEmissions	A collection of data elements containing information on the annual N_2O mass emissions from combustion in the CML configuration during the reporting year calculated using Equation C-10 expressed in mass of N_2O. Report the calculated value and mass unit of measure only.
TotalN2OCombustionEmissions.massUOM	Metric Tons

Figure 15
Sample XML Excerpt for Tier 4 CEMS Location and Emission Details

```
<ghg:Tier4CEMSDetails>
        <ghg:CEMSMonitoringLocation>
                <ghg:Name>003- CML</ghg:Name>
                <ghg:Description>CML</ghg:Description>
                <ghg:Type>Single process/process unit exhausts to dedicated stack</ghg:Type>
        </ghg:CEMSMonitoringLocation>
        <ghg:CO2EmissionsAllBiomassFuelsCombined massUOM="Metric Tons">
                <ghg:CalculatedValue>500</ghg:CalculatedValue>
        </ghg:CO2EmissionsAllBiomassFuelsCombined>
        <ghg:CO2EmissionsNonBiogenic massUOM="Metric Tons">
                <ghg:CalculatedValue>999500</ghg:CalculatedValue>
        </ghg:CO2EmissionsNonBiogenic>
        <ghg:AnnualCO2EmissionsMeasuredByCEMS massUOM="Metric Tons">
                <ghg:CalculatedValue>100000</ghg:CalculatedValue>
        </ghg:AnnualCO2EmissionsMeasuredByCEMS>
        <ghg:TotalCH4CombustionEmissions massUOM="Metric Tons">
                <ghg:CalculatedValue>111</ghg:CalculatedValue>
        </ghg:TotalCH4CombustionEmissions>
        <ghg:TotalN2OCombustionEmissions massUOM="Metric Tons">
                <ghg:CalculatedValue>11</ghg:CalculatedValue>
        </ghg:TotalN2OCombustionEmissions>
```

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

For each quarter of the reporting year, the facility must provide the cumulative CO_2 mass emissions for each CML [98.36(e)(2)(vi)(B)].

The facility must provide the following additional information for each CML:

- The total number of source operating hours in the reporting year [98.36(e)(2)(vi)(A)].
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO_2 concentration parameter [98.36(e)(2)(vi)(C) and 98.3(c)(8)].
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter [98.36(e)(2)(vi)(C) and 98.3(c)(8)].
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter [98.36(e)(2)(vi)(C) and 98.3(c)(8)].
- The Tier 4 methodology start date [98.36(b)(6), 98.36(c)(2)(vi)].
- The Tier 4 methodology end date [98.36(b)(7), 98.36(c)(2)(vii)].
- Specify if emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS [98.33(a)(4)(viii)]
- Each type of fuel combusted in the group of units during the reporting year [98.36(c)(1)(v)]
- The name of each process unit sharing the stack.

Figure 16
Tier 4 CEMS Quarter and Additional Details Schema Diagram

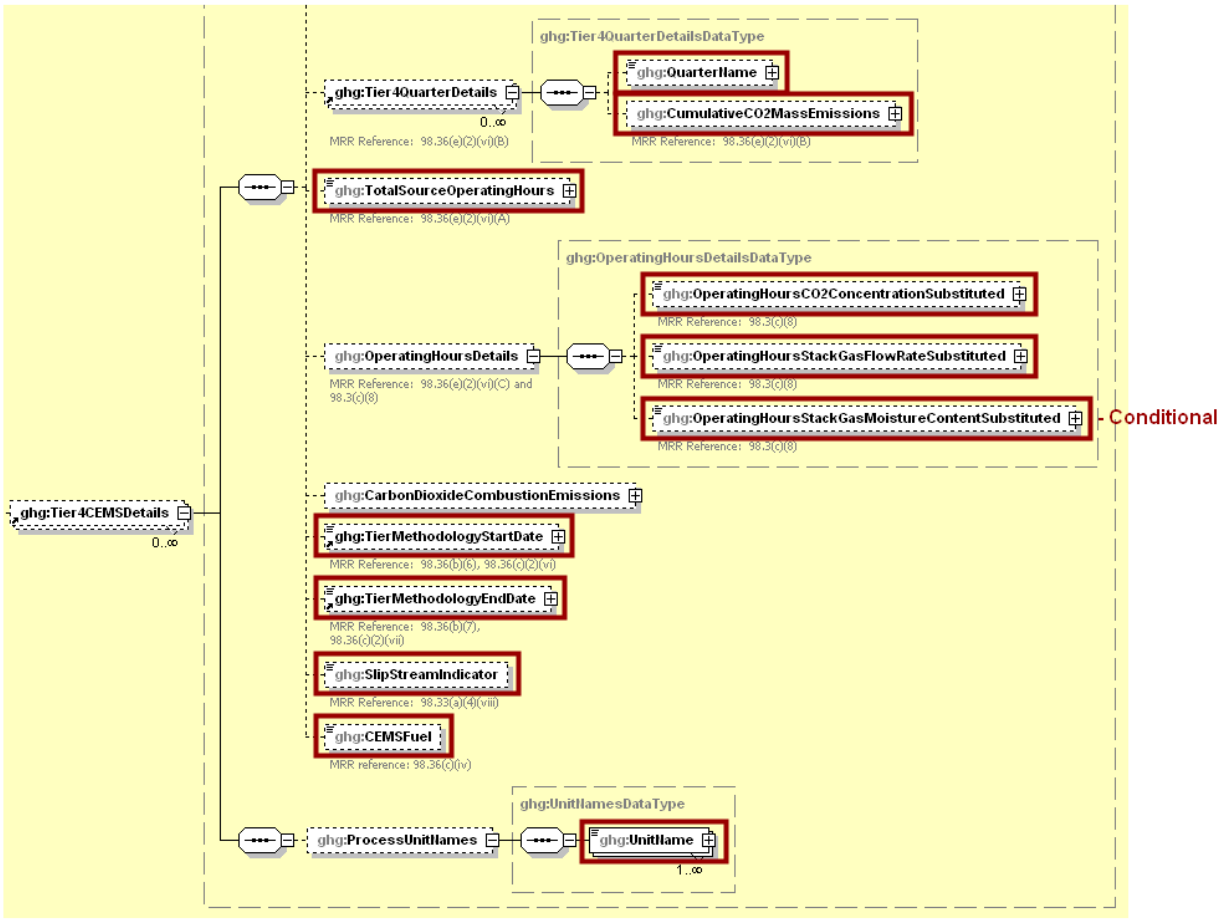


Table 6
Tier 4 CEMS Quarter and Additional Details XML Data Elements

Data Element Name	Description
Tier4QuarterDetails	A collection of data elements containing Tier 4 quarterly information.
QuarterName	The name of the quarter. See list of allowable values: First Quarter Second Quarter Third Quarter Fourth Quarter
CumulativeCO2MassEmissions	A collection of data elements containing information on the cumulative CO_2 mass emissions for the specified quarter of the reporting year. Report the calculated value and mass unit of measure only.
CumulativeCO2MassEmissions.massUOM	Metric Tons
TotalSourceOperatingHours	The total number of source operating hours in the reporting year.
OperatingHoursDetails	A collection of data elements containing information on the number of operating hours in which substitute data values were used.
OperatingHoursCO2ConcentrationSubstituted	The total operating hours in which a substitute data value was used in the emissions calculations for the CO_2 concentration parameter.
OperatingHoursStackGasFlowRateSubstituted	The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter.
OperatingHoursStackGasMoistureContentSubstituted	If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter.
TierMethodologyStartDate	The tier methodology start date for the specified CEMS monitoring location.
TierMethodologyEndDate	The tier methodology end date for the specified CEMS monitoring location.
SlipStreamIndicator	An indication (Y/N) that the emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS.
CEMSFuel	Each type of fuel combusted in the group of units during the reporting year.
ProcessUnitNames	A collection of data elements identifying each unit or furnace which was monitored at the specified CEMS monitoring location.
UnitName	The unit ID for each unit or furnace which was monitored at the specified CEMS monitoring location.

Figure 17
Sample XML Excerpt for Tier 4 CEMS Quarter and Additional Details

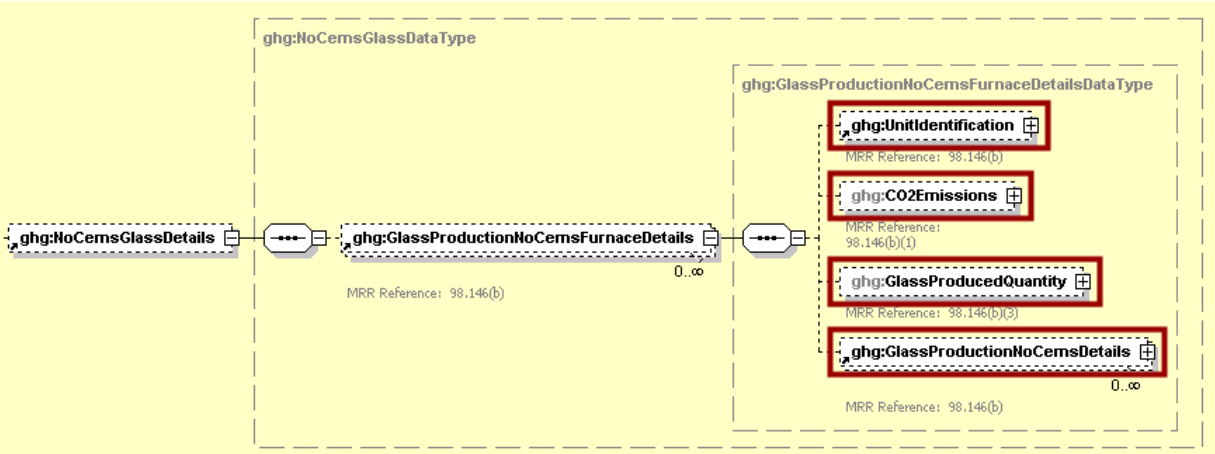
```
                    <ghg:Tier4QuarterDetails>
                        <ghg:QuarterName>First Quarter</ghg:QuarterName>
                        <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
                            <ghg:CalculatedValue>10000</ghg:CalculatedValue>
                        </ghg:CumulativeCO2MassEmissions>
                    </ghg:Tier4QuarterDetails>
                    <ghg:Tier4QuarterDetails>
                        <ghg:QuarterName>Second Quarter</ghg:QuarterName>
                        <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
                            <ghg:CalculatedValue>12000</ghg:CalculatedValue>
                        </ghg:CumulativeCO2MassEmissions>
                    </ghg:Tier4QuarterDetails>
                    <ghg:Tier4QuarterDetails>
                        <ghg:QuarterName>Third Quarter</ghg:QuarterName>
                        <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
                            <ghg:CalculatedValue>14000</ghg:CalculatedValue>
                        </ghg:CumulativeCO2MassEmissions>
                    </ghg:Tier4QuarterDetails>
                    <ghg:Tier4QuarterDetails>
                        <ghg:QuarterName>Fourth Quarter</ghg:QuarterName>
                        <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
                            <ghg:CalculatedValue>16000</ghg:CalculatedValue>
                        </ghg:CumulativeCO2MassEmissions>
                    </ghg:Tier4QuarterDetails>
                    <ghg:TotalSourceOperatingHours>10</ghg:TotalSourceOperatingHours>
                    <ghg:OperatingHoursDetails>
                        <ghg:OperatingHoursCO2ConcentrationSubstituted>11</ghg:OperatingHoursCO2Concentra
                        tionSubstituted>
                        <ghg:OperatingHoursStackGasFlowRateSubstituted>12</ghg:OperatingHoursStackGasFlow
                        RateSubstituted>
                        <ghg:OperatingHoursStackGasMoistureContentSubstituted>13</ghg:OperatingHoursStack
                        GasMoistureContentSubstituted>
                    </ghg:OperatingHoursDetails>
                    <ghg:TierMethodologyStartDate>2010-01-01</ghg:TierMethodologyStartDate>
                    <ghg:TierMethodologyEndDate>2010-12-31</ghg:TierMethodologyEndDate>
                    <ghg:SlipStreamIndicator>Y</ghg:SlipStreamIndicator>
                    <ghg:CEMSFuel>natural gas, coal</ghg:CEMSFuel>
                    <ghg:ProcessUnitNames>
                        <ghg:UnitName>002- CEMS</ghg:UnitName>
                    </ghg:ProcessUnitNames>
                </ghg:Tier4CEMSDetails>
```

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

6.0 Non-CEMS Unit Details

This section includes information to be reported for each unit which was not monitored by a CEMS during the reporting year.

Figure 18
Non-CEMS Unit Details Schema Diagram



Subpart N requires the following identification information for each continuous glass melting furnace that did not have emissions monitored using a CEMS [98.146(b)]:

- A unique unit name or identifier (e.g., a unit ID number).
- An optional unit description or label.
- The type of unit: "Continuous Glass Melting Furnace".

For each continuous glass melting furnace in your facility, Subpart N requires you to report the following information:

- The total annual CO_2 process emissions for each furnace in metric tons (the output of Equation N-1) [98.146(b)(1)].
- The annual quantity of glass produced by each glass melting furnace in short tons [98.146(b)(3)].

Table 7
Non-CEMS Unit Details XML Data Elements

Data Element Name	Description
NoCemsGlassDetails	
GlassProductionNoCemsFurnaceDetails	
UnitIdentification	A collection of data elements containing the identity of each continuous glass melting furnace that does not use a CEMS to measure CO_2 emissions. It includes the unit ID, a brief optional description and the unit type: Continuous Glass Melting Furnace
CO2Emissions	A collection of data elements containing information on CO_2 process emissions for the specified furnace. Report the calculated value and mass unit of measure only.
CO2Emissions.massUOM	Metric Tons
GlassProducedQuantity	A collection of data elements containing information on the total quantity of glass produced by the specified furnace. Report the measured value and mass unit of measure only.
GlassProducedQuantity.massUOM	Short Tons

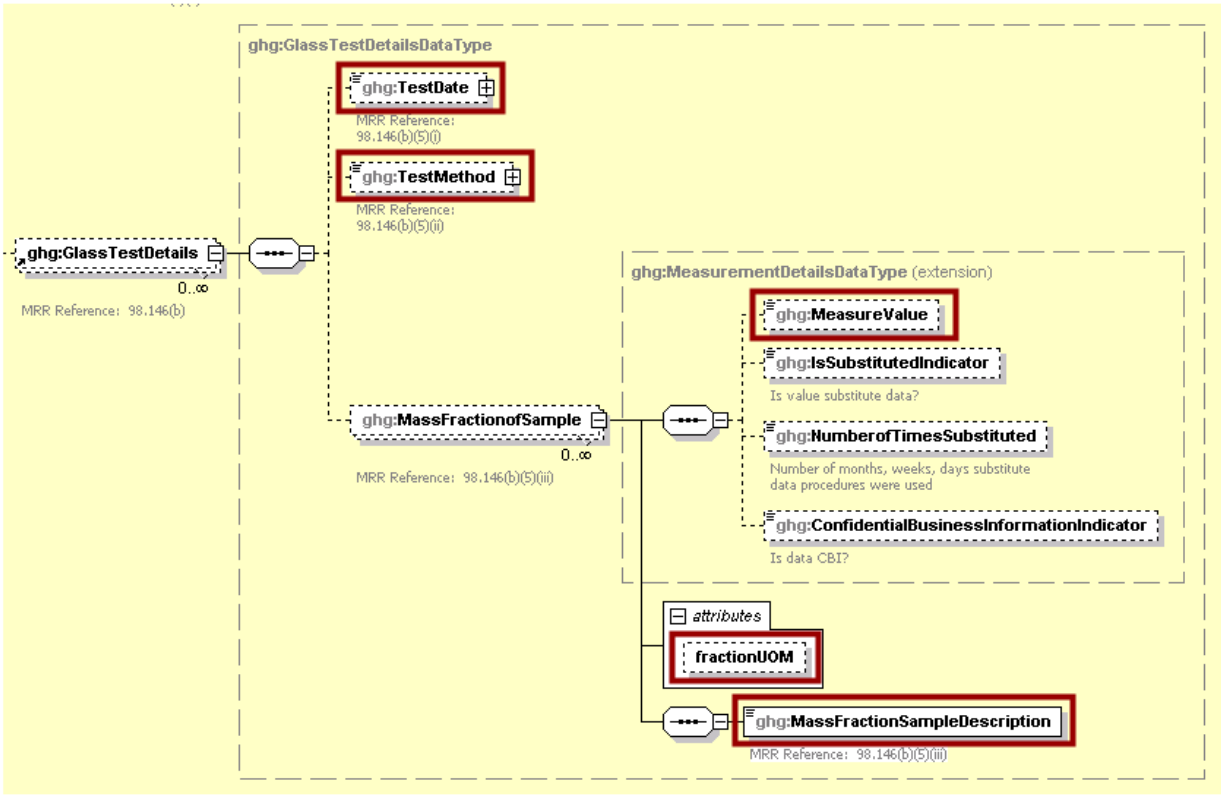
Figure 19
Sample XML Excerpt for Non-CEMS Unit Details

```
<ghg:NoCemsGlassDetails>
    <ghg:GlassProductionNoCemsFurnaceDetails>
        <ghg:UnitIdentification>
            <ghg:UnitName>001- Non-CEMS</ghg:UnitName>
            <ghg:UnitDescription>Non-CEMS unit</ghg:UnitDescription>
            <ghg:UnitType>Continuous Glass Melting Furnace</ghg:UnitType>
        </ghg:UnitIdentification>
        <ghg:GlassProducedQuantity massUOM="Short Tons">
            <ghg:MeasureValue>10000</ghg:MeasureValue>
        </ghg:GlassProducedQuantity>
```

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

Figure 20
Glass Production Details Schema Diagram

Figure 21
Glass Test Details Schema Diagram



For each continuous glass melting furnace, the system shall require the facility to identify each carbonate-based raw material charged to the furnace from the following list [98.146(b)]:

- Limestone
- Dolomite
- Sodium carbonate
- Barium carbonate
- Potassium carbonate
- Lithium carbonate
- Strontium carbonate

For each carbonate-based raw material charged to each continuous glass melting furnace, the following must be reported:

- The number of months that missing data procedures were followed to measure monthly quantities of the carbonate-based raw material [98.146(b)(9)].
- The number of months that missing data procedures were followed to measure monthly mass fraction of the carbonate-based raw material [98.146(b)(9)].

For each carbonate-based raw material charged to each continuous glass melting furnace, data for one or more mass fraction verification tests must be reported. For each test, provide the following:

- The date of the test [98.146(b)(5)(i)].
- The method(s) and any variations used in the analyses [98.146(b)(5)(ii)].
- Data for one or more samples analyzed. For each sample analyzed, provide the following:
  - The mass fraction determined by analysis of the sample [98.146(b)(5)(iii)].
  - A unique description/label for the sample [98.146(b)(5)(iii)].

For each carbonate-based raw material charged to each continuous glass melting furnace, report the method used to determine the fraction of calcinations [98.146(b)(7)]:

- Default value (1.0)
- Chemical analysis using x-ray fluorescence
- Other method used, if applicable

Table 8
Glass Production Details XML Data Elements

Data Element Name	Description
GlassProductionNoCemsDetails	
CarbonateType	Each carbonate-based raw material charged to the specified continuous glass melting furnace. See list of allowable values: Limestone Dolomite Sodium carbonate Barium carbonate Potassium carbonate Lithium carbonate Strontium carbonate

Data Element Name	Description
NumberofTimesMissingDataProceduresUsedforRawMaterialQuantity	For the specified carbonate-based raw material charged to the specified continuous glass melting furnace, the number of months that missing data procedures were followed to measure monthly quantities of the carbonate-based raw material.
NumberofTimesMissingDataProceduresUsedforCarbonateBasedMineralMassFraction	For the specified carbonate-based raw material charged to the specified continuous glass melting furnace, the number of months that missing data procedures were followed to measure monthly mass fractions.
GlassTestDetails	A collection of data elements containing information on the results of all tests used to verify the carbonate-based mineral mass fraction for the specified carbonate-based raw material charged to the specified continuous glass melting furnace
TestDate	The date of each mass fraction verification test for the specified carbonate-based raw material charged to the specified continuous glass melting furnace (YYYY-MM-DD).
TestMethod	The method(s) and any variations used in the analyses for each mass fraction verification test for the specified carbonate-based raw material charged to the specified continuous glass melting furnace.
MassFractionofSample	A collection of data elements containing information on the mass fraction determined by analysis of each sample by a mass fraction verification test. Report each value separately. Report the measured value and fraction unit of measure only.
MassFractionofSample.fractionUOM	decimal fraction
MassFractionSampleDescription	A unique description/label for each sample analyzed by a mass fraction verification test.
CalcinationFractionDeterminationMethod	The method used to determine the fraction of calcinations. See list of allowable values: Default value (1.0) Chemical analysis using x-ray fluorescence Other
OtherCalcinationFractionDeterminationMethod	Specify the method used to determine the fraction of calcinations if "Other" was specified.

Figure 22
Sample XML Excerpt for Glass Production

```
                    <ghg:GlassProductionNoCemsDetails>
                        <ghg:CarbonateType>Dolomite</ghg:CarbonateType>
                        <ghg:NumberofTimesMissingDataProceduresUsedforRawMaterialQuantity>1</ghg
                        :NumberofTimesMissingDataProceduresUsedforRawMaterialQuantity>
                        <ghg:NumberofTimesMissingDataProceduresUsedforCarbonateBasedMineralMassF
                        raction>2</ghg:NumberofTimesMissingDataProceduresUsedforCarbonateBasedMi
                        neralMassFraction>
                        <ghg:GlassTestDetails>
                            <ghg:TestDate>2010-04-04</ghg:TestDate>
                            <ghg:TestMethod>Method A</ghg:TestMethod>
                            <ghg:MassFractionofSample fractionUOM="decimal fraction">
                                <ghg:MeasureValue>0.25</ghg:MeasureValue>
                                <ghg:MassFractionSampleDescription>Test
                                1</ghg:MassFractionSampleDescription>
                            </ghg:MassFractionofSample>
                            <ghg:MassFractionofSample fractionUOM="decimal fraction">
                                <ghg:MeasureValue>0.35</ghg:MeasureValue>
                                <ghg:MassFractionSampleDescription>Test
                                2</ghg:MassFractionSampleDescription>
                            </ghg:MassFractionofSample>
                        </ghg:GlassTestDetails>
                        <ghg:CalcinationFractionDeterminationMethod>Default value
                        (1.0)</ghg:CalcinationFractionDeterminationMethod>
                    </ghg:GlassProductionNoCemsDetails>
                    <ghg:GlassProductionNoCemsDetails>
                        <ghg:CarbonateType>Limestone</ghg:CarbonateType>
                        <ghg:NumberofTimesMissingDataProceduresUsedforRawMaterialQuantity>3</ghg
                        :NumberofTimesMissingDataProceduresUsedforRawMaterialQuantity>
                        <ghg:NumberofTimesMissingDataProceduresUsedforCarbonateBasedMineralMassF
                        raction>4</ghg:NumberofTimesMissingDataProceduresUsedforCarbonateBasedMi
                        neralMassFraction>
                        <ghg:GlassTestDetails>
                            <ghg:TestDate>2010-12-01</ghg:TestDate>
                            <ghg:TestMethod>Method B</ghg:TestMethod>
                            <ghg:MassFractionofSample fractionUOM="decimal fraction">
                                <ghg:MeasureValue>0.4</ghg:MeasureValue>
                                <ghg:MassFractionSampleDescription>Test
                                3</ghg:MassFractionSampleDescription>
                            </ghg:MassFractionofSample>
                            <ghg:MassFractionofSample fractionUOM="decimal fraction">
                                <ghg:MeasureValue>0.5</ghg:MeasureValue>
                                <ghg:MassFractionSampleDescription>Test
                                4</ghg:MassFractionSampleDescription>
                            </ghg:MassFractionofSample>
                        </ghg:GlassTestDetails>
                        <ghg:CalcinationFractionDeterminationMethod>Chemical analysis using x-ray
                        fluorescence</ghg:CalcinationFractionDeterminationMethod>
                    </ghg:GlassProductionNoCemsDetails>
                    <ghg:GlassProductionNoCemsDetails>
                        <ghg:CarbonateType>Potassium carbonate</ghg:CarbonateType>
                        <ghg:NumberofTimesMissingDataProceduresUsedforRawMaterialQuantity>7</ghg
                        :NumberofTimesMissingDataProceduresUsedforRawMaterialQuantity>
                        <ghg:NumberofTimesMissingDataProceduresUsedforCarbonateBasedMineralMassF
                        raction>8</ghg:NumberofTimesMissingDataProceduresUsedforCarbonateBasedMi
                        neralMassFraction>
                        <ghg:GlassTestDetails>
                            <ghg:TestDate>2010-11-11</ghg:TestDate>
                            <ghg:TestMethod>Method E</ghg:TestMethod>
                            <ghg:MassFractionofSample fractionUOM="decimal fraction">
                                <ghg:MeasureValue>0.222</ghg:MeasureValue>
                                <ghg:MassFractionSampleDescription>Test
                                5</ghg:MassFractionSampleDescription>
                            </ghg:MassFractionofSample>
                        </ghg:GlassTestDetails>
                        <ghg:CalcinationFractionDeterminationMethod>Default value
                        (1.0)</ghg:CalcinationFractionDeterminationMethod>
                    </ghg:GlassProductionNoCemsDetails>
                </ghg:GlassProductionNoCemsFurnaceDetails>
            </ghg:NoCemsGlassDetails>
```

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

7.0 Facility-Level Roll-up Emissions

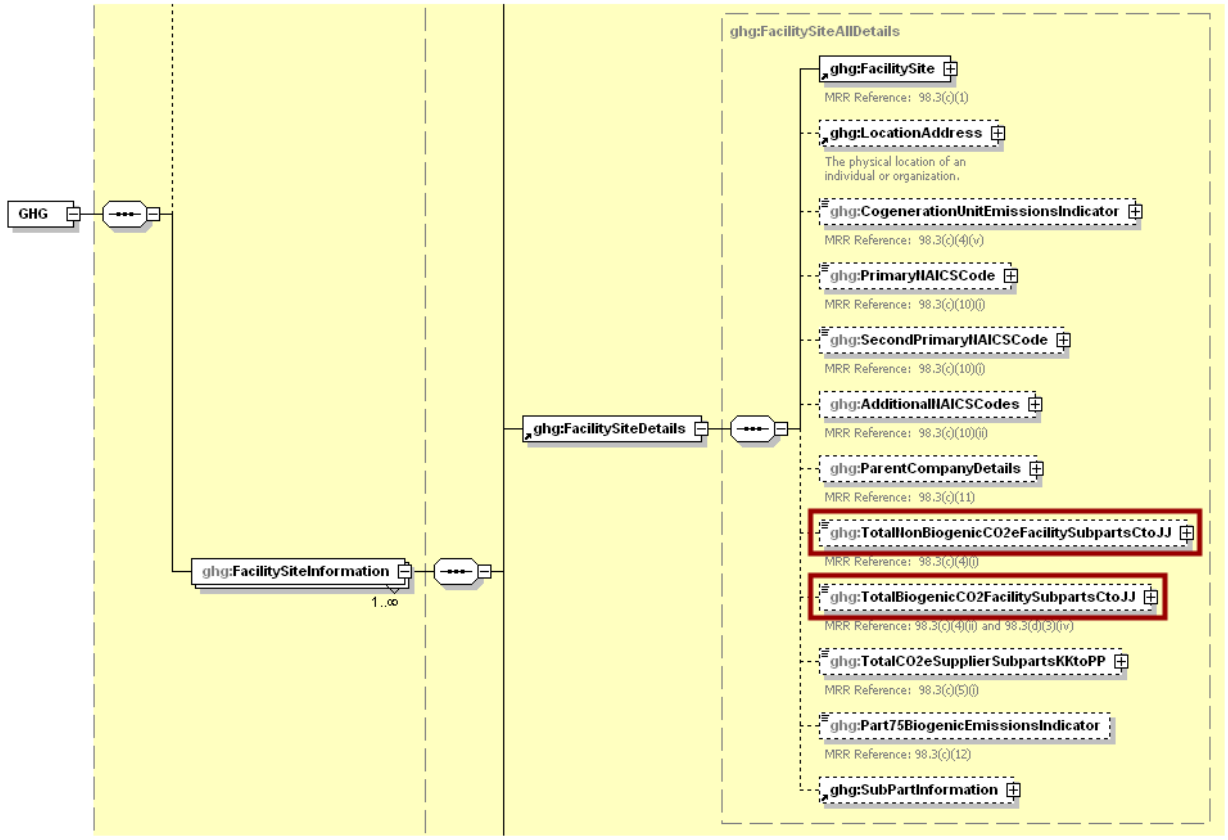
Each facility must report the following facility-level emission totals:

- 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 23
Facility-Level Roll-up Emissions Schema Diagram



1) Add the total CO_2e value for Subpart N 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:

   - Add the total annual CO_2 process emissions from each furnace (Equation N-1) in metric tons rounded to one decimal place for each non-CEMS unit.
   - Add the total annual CO_2 mass emissions measured by the CEMS in metric tons rounded to one decimal place minus the total annual biogenic CO_2 mass emissions for the CML in

metric tons rounded to one decimal place (the difference of the total CO_2 monitored by the CEMS and the total biogenic CO_2) for each CML.

- Multiply the total CH_4 emissions in metric tons rounded to two decimal places by the Global Warming Potential for CH_4 (21) for each CML and add the resulting value.
- Multiply the total N_2O emissions in metric tons rounded to three decimal places by the Global Warming Potential for N_2O (310) for each CML and add the resulting value.

2) Add the total annual biogenic CO_2 mass emissions in metric tons rounded to one decimal place for each CML to the total biogenic CO_2 aggregated across all source category subparts associated with the facility.

Table 9
Facility Level Roll-up Emissions XML Data Elements

Data Element Name	Description
TotalNonBiogenicCO2eFacilitySubpartsCtoJJ	Add the total CO_2e value for Subpart N 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
TotalBiogenicCO2FacilitySubpartsCtoJJ	Add the total annual biogenic CO_2 value for Subpart N in metric tons to the total biogenic CO_2 emissions aggregated across all source category subparts associated with the facility according to the guideline above.
TotalBiogenicCO2FacilitySubpartsCtoJJ.massUOM	Metric Tons

Figure 24
Sample XML Excerpt for Facility Level Roll-up Emissions

```
<ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric
Tons">255241</ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ>
<ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">500</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

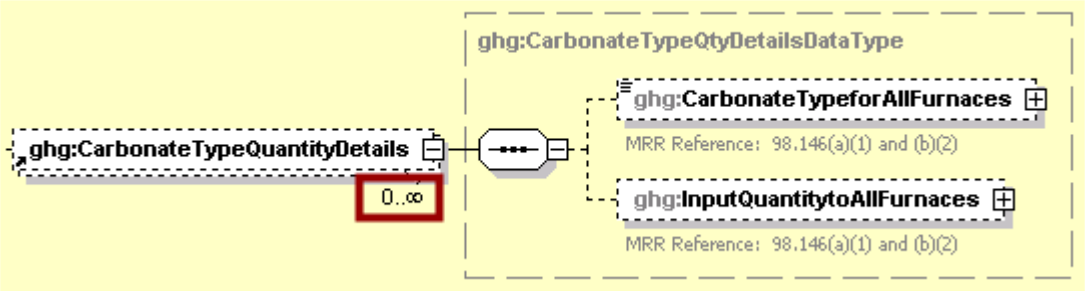
Legend for Tables

Blue = parent element

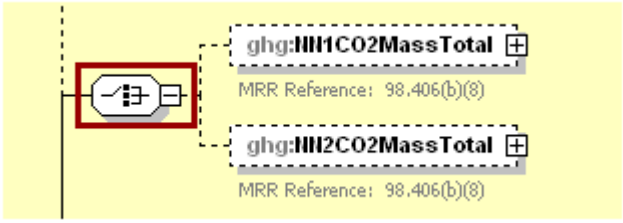
Legend for XML Schema Diagrams

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 N

(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>524657</ghg:FacilitySiteIdentifier>
        <ghg:FacilitySiteName>Test Facility N</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>327211</ghg:PrimaryNAICSCode>
      <ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric Tons">255241</ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ>
      <ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">500</ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ>
      <ghg:TotalCO2eSupplierSubpartsKKtoPP massUOM="Metric Tons">0</ghg:TotalCO2eSupplierSubpartsKKtoPP>
      <ghg:Part75BiogenicEmissionsIndicator>No Part 75 methods used</ghg:Part75BiogenicEmissionsIndicator>
      <ghg:SubPartInformation>
            <ghg:SubPartN>
                  <ghg:GHGasInfoDetails>
                        <ghg:GHGasName>Biogenic Carbon dioxide</ghg:GHGasName>
                        <ghg:GHGasQuantity massUOM="Metric Tons">
                              <ghg:CalculatedValue>500</ghg:CalculatedValue>
                        </ghg:GHGasQuantity>
                  </ghg:GHGasInfoDetails>
                  <ghg:GHGasInfoDetails>
                        <ghg:GHGasName>Methane</ghg:GHGasName>
                        <ghg:GHGasQuantity massUOM="Metric Tons">
                              <ghg:CalculatedValue>111</ghg:CalculatedValue>
                        </ghg:GHGasQuantity>
                  </ghg:GHGasInfoDetails>
                  <ghg:GHGasInfoDetails>
                        <ghg:GHGasName>Nitrous Oxide</ghg:GHGasName>
                        <ghg:GHGasQuantity massUOM="Metric Tons">
                              <ghg:CalculatedValue>11</ghg:CalculatedValue>
                        </ghg:GHGasQuantity>
                  </ghg:GHGasInfoDetails>
                  <ghg:GHGasInfoDetails>
                        <ghg:GHGasName>Carbon Dioxide</ghg:GHGasName>
                        <ghg:GHGasQuantity massUOM="Metric Tons">
                              <ghg:CalculatedValue>249500</ghg:CalculatedValue>
                        </ghg:GHGasQuantity>
                  </ghg:GHGasInfoDetails>
                  <ghg:TotalGlassProducedQuantity massUOM="tons">
                        <ghg:MeasureValue>30000</ghg:MeasureValue>
                  </ghg:TotalGlassProducedQuantity>
                  <ghg:CemsGlassUnitDetails>
                        <ghg:GlassProductionFurnaceDetails>
                              <ghg:UnitIdentification>
                                    <ghg:UnitName>002- CEMS</ghg:UnitName>
                                    <ghg:UnitDescription>CEMS unit</ghg:UnitDescription>
                                    <ghg:UnitType>Continuous Glass Melting Furnace</ghg:UnitType>
                              </ghg:UnitIdentification>
                              <ghg:GlassProductionCemsDetails>
                                    <ghg:CarbonateType>Limestone</ghg:CarbonateType>
                                    <ghg:AnnualRawMaterialQuantity massUOM="Short Tons">
                                          <ghg:MeasureValue>5000</ghg:MeasureValue>
                                    </ghg:AnnualRawMaterialQuantity>
                              </ghg:GlassProductionCemsDetails>
```

```
                        <ghg:GlassProductionCemsDetails>
                                <ghg:CarbonateType>Barium carbonate</ghg:CarbonateType>
                                <ghg:AnnualRawMaterialQuantity massUOM="tons">
                                        <ghg:MeasureValue>6000</ghg:MeasureValue>
                                </ghg:AnnualRawMaterialQuantity>
                        </ghg:GlassProductionCemsDetails>
                        <ghg:GlassProduced massUOM="Short Tons">
                                <ghg:MeasureValue>20000</ghg:MeasureValue>
                        </ghg:GlassProduced>
                </ghg:GlassProductionFurnaceDetails>
        </ghg:CemsGlassUnitDetails>
        <ghg:CarbonateTypeQuantityDetails>
                <ghg:CarbonateTypeforAllFurnaces>LimeStone</ghg:CarbonateTypeforAllFurnaces>
                <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                        <ghg:MeasureValue>1000</ghg:MeasureValue>
                </ghg:InputQuantitytoAllFurnaces>
        </ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeQuantityDetails>
                <ghg:CarbonateTypeforAllFurnaces>Dolomite</ghg:CarbonateTypeforAllFurnaces>
                <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                        <ghg:MeasureValue>1100</ghg:MeasureValue>
                </ghg:InputQuantitytoAllFurnaces>
        </ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeQuantityDetails>
                <ghg:CarbonateTypeforAllFurnaces>SodiumCarbonate</ghg:CarbonateTypeforAllFurnaces>
                <ghg:InputQuantitytoAllFurnaces massUOM="Short Tons">
                        <ghg:MeasureValue>1200</ghg:MeasureValue>
                </ghg:InputQuantitytoAllFurnaces>
        </ghg:CarbonateTypeQuantityDetails>
        <ghg:CarbonateTypeQuantityDetails>
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