

Greenhouse Gas Reporting Program

XML Reporting Instructions for Subpart H - Cement 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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I. 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 XML schema defines expected data elements and attributes, allowable data formats for each data element, and the hierarchical structure and sequence in which data elements must appear in the XML file. 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 data element (GHG) and complex and simple data 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 data element is the base of the XML schema.

The schema's structure can be thought of as a family tree. 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.

The XML upload method may be used for reporting a facility or supplier's annual greenhouse gas (GHG) data; however, the following actions can only be performed using the e-GGRT web forms:

- User, facility and supplier registration
- Certificate of Representation and Notice of Delegation signing
- Facility representative and agent changes
- Facility and supplier address changes
- Notice of intent to not submit an annual GHG report

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

An XML submission must 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 Element Definitions table.

The e-GGRT XML Reporting Schema is available for download at the e-GGRT help website: <http://www.cdcsupport.com/confluence/display/help/XML+Reporting+Instructions>. The zip file contains:

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

Table 1
Reporting Numbers

Number Format	Description
Rounding	<ul style="list-style-type: none"> • CO₂e and CO₂ 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. • CH₄ emissions data expressed in metric tons should be rounded to two decimal places. • N₂O emissions data expressed in metric tons should be rounded to three decimal places. • Emissions data for all GHGs other than CO₂, N₂O and CH₄ 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.). • 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. • In the case of aggregation/roll-ups, those calculations should be performed on the rounded values.
Percentages	If a value must be reported as a percentage, then the number should be within the range of 0 to 100 (percent), e.g. 85.5% should be reported as 85.5.
Fractions	If a value must be reported as a decimal fraction, then the number should be within the range of 0 and 1, e.g., 1/4 should be reported as 0.25. Leading zeroes are optional.

Key XML Terms

- **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. The schema also defines the set of rules to which the XML document must conform in order to be considered "valid".
- **XML file:** A file containing data organized into a structured document using XML markup.
- **Data Element:** An XML data element is used for storing and classifying data in an XML file. Opening and closing tags represent the start and end of a data element. An opening tag looks like <elementName>, while a closing tag has a slash that is placed before the element's name </elementName>. The following example shows how to report the facility's identification

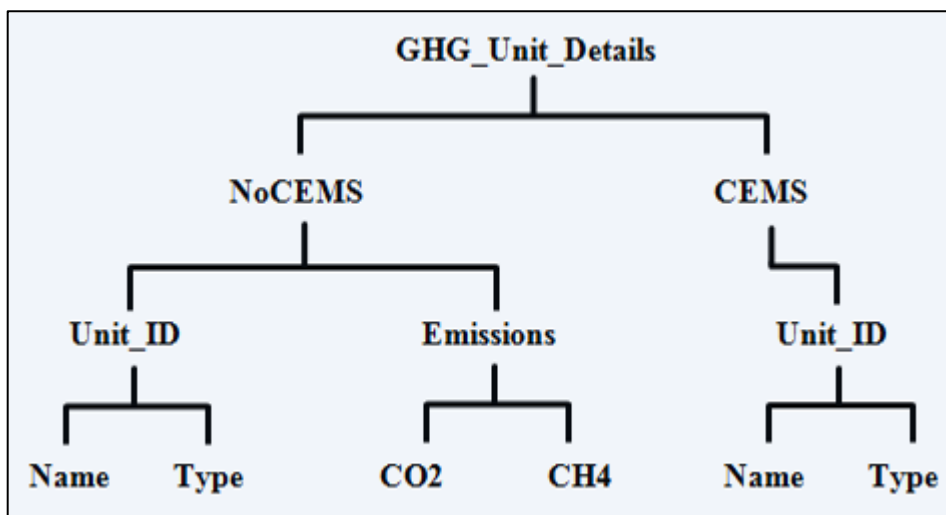
number: <FacilitySiteIdentifier>23222</FacilitySiteIdentifier>. The information shaded in blue represents the data element's value.

If a data element does not contain a value, then a single empty tag name may be used. An empty tag has a slash placed after the element's name <FacilitySiteIdentifier/>. **Note:** If you do not intend to report a value for a particular data element, then it is recommended that you do not include the data element in the XML file.

- **Attribute:** An XML attribute contains additional information about a specific data element. An attribute for a data element is placed within the opening tag. The syntax for including an attribute in an element is <elementName attributeName="value">. For example, <TotalCH4CombustionEmissionsmassUOM="Metric Tons">.
- **Root/Parent/Child Element:** The schema's structure can be thought of as a family tree. At the top of the tree is some early ancestor and at the bottom of the tree are the latest children. With a tree structure you can see which children belong to which parents and many other relationships.

XML data elements are sometimes referenced in terms of how they relate to each other, e.g., parent-child relationships, within the schema's tree structure, also known as hierarchy. The top of the XML tree is considered the root – it is the parent to all data elements within the schema. In the example below, "GHG_Unit_Details" is the root, and just like in many other family trees, there is more than one item with the same name (e.g., "Unit_ID"). The easiest way to distinguish these items is by referencing them in terms of their parent-child relationships, e.g., NoCEMS /Unit_ID vs. CEMS/Unit_ID.

Figure 1
Example of an XML Tree



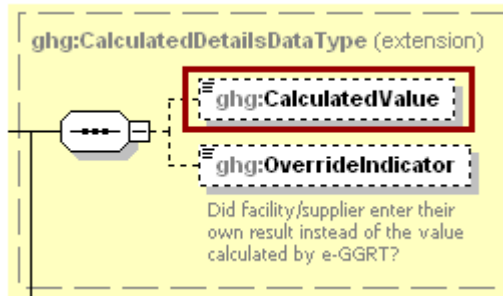
This document provides a step-by-step description of how to report emissions data using the XML schema. Please note the following:

- **Non-applicable data elements should not be included in the facility's XML file.** The schema contains many data elements, some of which may not be applicable to XML reporters in general or to a particular situation. If a data element is not referenced in the instructions (definition tables), then **do not** report or include it in the facility's XML file.
- **Data elements must be reported in a specific order.** The figures and tables in this document depict the specific sequence in which data elements must be arranged in the facility's XML file in order to produce a well-formed XML report.
- **Enumerations are case sensitive.** Many data elements have a defined set of allowable values, also known as enumerations. Values for enumerations must be entered exactly as they are defined within the schema (including punctuation marks) in order to be accepted by schema validation. See the definition tables for a complete list of enumerations.
- **Schema diagrams depict the hierarchy (or tree structure).** The primary purpose of the schema diagrams is to indicate the sequence in which data elements must appear within the facility's XML file and to identify the data elements that are required (must be reported) and conditionally required (see last bullet). Required data elements are boxed in red and conditionally required data elements are noted.
- **Definition tables provide details for required and conditionally required data elements.** The tables are designed to provide unique instructions for reporting a given data element, including the list of enumerations and required units of measure, if defined. As noted above, there are some data elements in the schema that are not applicable to XML reporters or to a particular situation. For example, the "OverrideIndicator" data element is used solely by e-GGRT to indicate that the web form reporter chose to override the system's calculated value with their own. These non-applicable data elements **are not** included in the definition tables. If a data element is not referenced in a definition table, then **do not** report or include it in the facility's XML file.
- **Commonly used data types are not depicted in the schema diagrams nor listed separately in the definition tables.** The schema diagrams display almost every data element in the schema except those that are associated with the three most commonly occurring data types:
 - Calculated Details
 - Measurement Details
 - Unit Identification Details

Once defined, these data types (static collection of data elements) are then associated as children to every data element in the schema containing a measured or calculated value or unit details. These child data elements do not appear in the diagrams and are not listed on separate rows in the definition tables in order to reduce their redundancy. They are however, referenced in the tables in the description of their parent data element. See Figures 2-4 and Tables 2-4.

- **Some data elements are conditionally required.** Data elements which are conditionally required are noted in the schema diagrams and the data element definitions tables. If your facility meets the condition specified for the data element, then the data element is required and you must report it in the facility's XML file. If your facility does not meet the condition specified for the data element, then **do not** include the data element in the facility's XML file. If a parent element is not required, then **do not** include any of its child data elements in the facility's XML file.

Figure 2
Calculated Details Data Type Schema Diagram

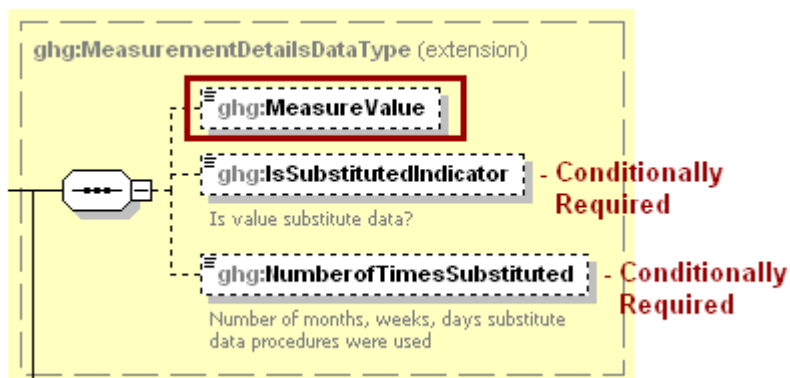


Note: Data elements boxed in red are required.

Table 2
Calculated Details Data Element Definitions

Data Element Name	Description
CalculatedDetailsDataType	
CalculatedValue	Calculated value (decimal).
OverrideIndicator	Note: Do not include this data element in the facility’s XML file because it only applies to web form reporters. It is a flag set by e-GGRT to indicate that the system-calculated value was overridden with the web form reporter’s value.

Figure 3
Measurement Details Data Type Schema Diagram

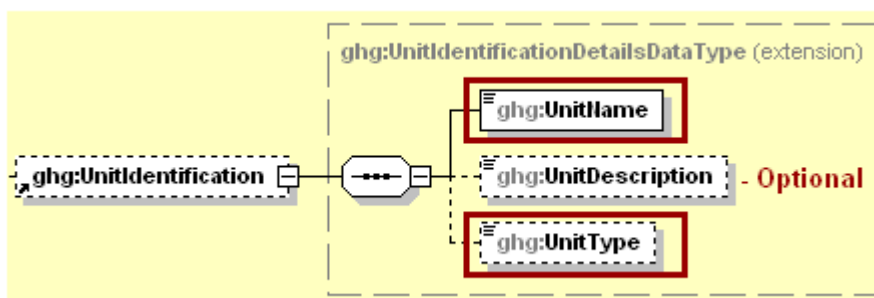


Note: Data elements boxed in red are required. Please see page 4 of this document for more information on conditionally required elements.

**Table 3
Measurement Details Data Element Definitions**

Data Element Name	Description
MeasurementDetailsDataType	
MeasureValue	Measured value (decimal).
IsSubstitutedIndicator	An indication (Y/N) that the measure value contains substituted data. Note: Do not include this data element in your XML file unless noted in the instructions for the particular measured value.
NumberofTimesSubstituted	The number (integer) of days, months, weeks or hours in the reporting year that missing data procedures were followed. Note: Do not include this data element in your XML file unless noted in the instructions for the particular measured value.

**Figure 4
Unit Identification Details Data Type Schema Diagram**



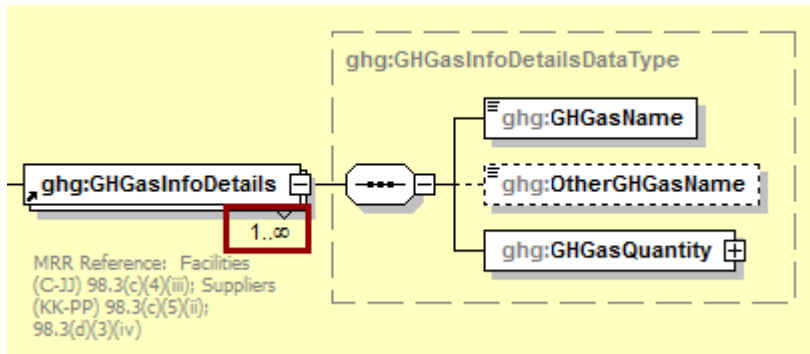
Note: Data elements boxed in red are required.

**Table 4
Unit Identification Details Data Element Definitions**

Data Element Name	Description
UnitIdentificationDetails	
UnitName	A unique name (ID) for each unit so that the data for different units can be recorded, maintained and retrieved clearly.
UnitDescription	Optional brief description of the unit.
UnitType	The type of unit. The list of allowable values varies. For more information, see the instructions for the specific unit process to be reported. For example, if reporting Flare Gas details, the unit type would be “Flare”.

The XML symbol “1..∞” shown in Figure 5 means that the parent element is “unbounded” so that multiple instances of the parent element can be reported. XML Excerpt 1 shows an example of reporting multiple instances of a parent element.

Figure 5
“Unbounded” Symbol in Schema Diagram



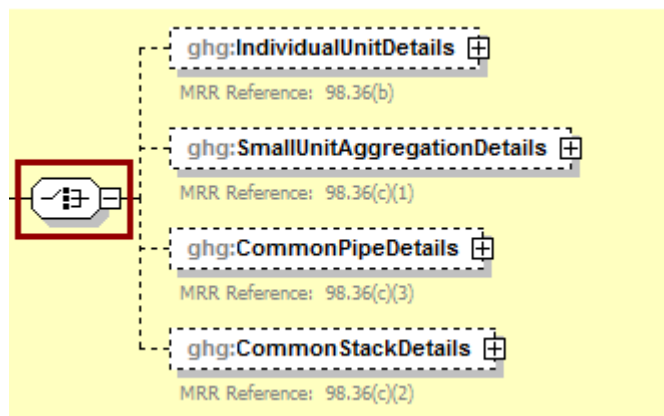
XML Excerpt 1
Example for “Unbounded” Parent Element

```

<ghg:GHGasInfoDetails>
  <ghg:GHGasName>Carbon Dioxide </ghg:GHGasName>
  <ghg:GHGasQuantity massUOM="Metric Tons">
    <ghg:CalculatedValue>384781.2</ghg:CalculatedValue>
  </ghg:GHGasQuantity></ghg:GHGasInfoDetails>
<ghg:GHGasInfoDetails>
<ghg:GHGasInfoDetails>
  <ghg:GHGasName>Methane</ghg:GHGasName>
  <ghg:GHGasQuantity massUOM="Metric Tons">
    <ghg:CalculatedValue>4004.12</ghg:CalculatedValue>
  </ghg:GHGasQuantity></ghg:GHGasInfoDetails>
</ghg:GHGasInfoDetails>
    
```

The XML symbol for a logical “Or” shown in Figure 6 means that **only one** of the data elements following the symbol can be reported for the current instance of the parent element.

Figure 6
Logical “Or” Symbol in Schema Diagram



II. Summary of Changes

The following modifications were applied to the previous version of the GHG XML schema in relation to Subpart H (GHG_SubPartH_v2.0.xsd) for reporting year 2011.

Table 5
Summary of Changes to the Schema for Subpart H

No.	Change Description
CemsUnitCementDetails / CemsMonthlyCementDetails	
1	<p>Added the following enumerations for data element "MonthName": <i>January, February, March, April, May, June, July, August, September, October, November and December.</i></p> <p>XPath = SubPartH/CemsUnitCementDetails/CemsMonthlyCementDetails/MonthName</p>
NoCemsCementDetails / MonthlyCementDetails	
2	<p>Removed unit of measure attribute "massUOM" from data element "ClinkerProduction".</p> <p>XPath = SubPartH/NoCemsCementDetails/MonthlyCementDetails/ClinkerProduction</p>
3	<p>Removed unit of measure attribute "fractionUOM" from data element "FractionTotalCalciumOxideContentinClinker".</p> <p>XPath = SubPartH/NoCemsCementDetails/MonthlyCementDetails/FractionTotalCalciumOxideContentinClinker</p>
4	<p>Removed unit of measure attribute "fractionUOM" from data element "FractionNonCalcinedCalciumOxideContentinClinker".</p> <p>XPath = SubPartH/NoCemsCementDetails/MonthlyCementDetails/FractionNonCalcinedCalciumOxideContentinClinker</p>
5	<p>Removed unit of measure attribute "fractionUOM" from data element "FractionTotalMagnesiumOxideContentinClinker".</p> <p>XPath = SubPartH/NoCemsCementDetails/MonthlyCementDetails/FractionTotalMagnesiumOxideContentinClinker</p>
6	<p>Removed unit of measure attribute "fractionUOM" from data element "FractionNonCalcinedMagnesiumOxideContentinClinker".</p> <p>XPath = SubPartH/NoCemsCementDetails/MonthlyCementDetails/FractionNonCalcinedMagnesiumOxideContentinClinker</p>

No.	Change Description
	NoCemsCementDetails / QuarterlyCementDetails
7	<p>Removed unit of measure attribute “fractionUOM” from data element “CementKilnDustNotRecycledtoKiln”.</p> <p>XPath = SubPartH/NoCemsCementDetails/QuarterlyCementDetails/CementKilnDustNotRecycledtoKiln</p>
8	<p>Removed unit of measure attribute “fractionUOM” from data element “FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled”.</p> <p>XPath = SubPartH/NoCemsCementDetails/QuarterlyCementDetails/FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled</p>
9	<p>Removed unit of measure attribute “fractionUOM” from data element “FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled”.</p> <p>XPath = SubPartH/NoCemsCementDetails/QuarterlyCementDetails/FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled</p>

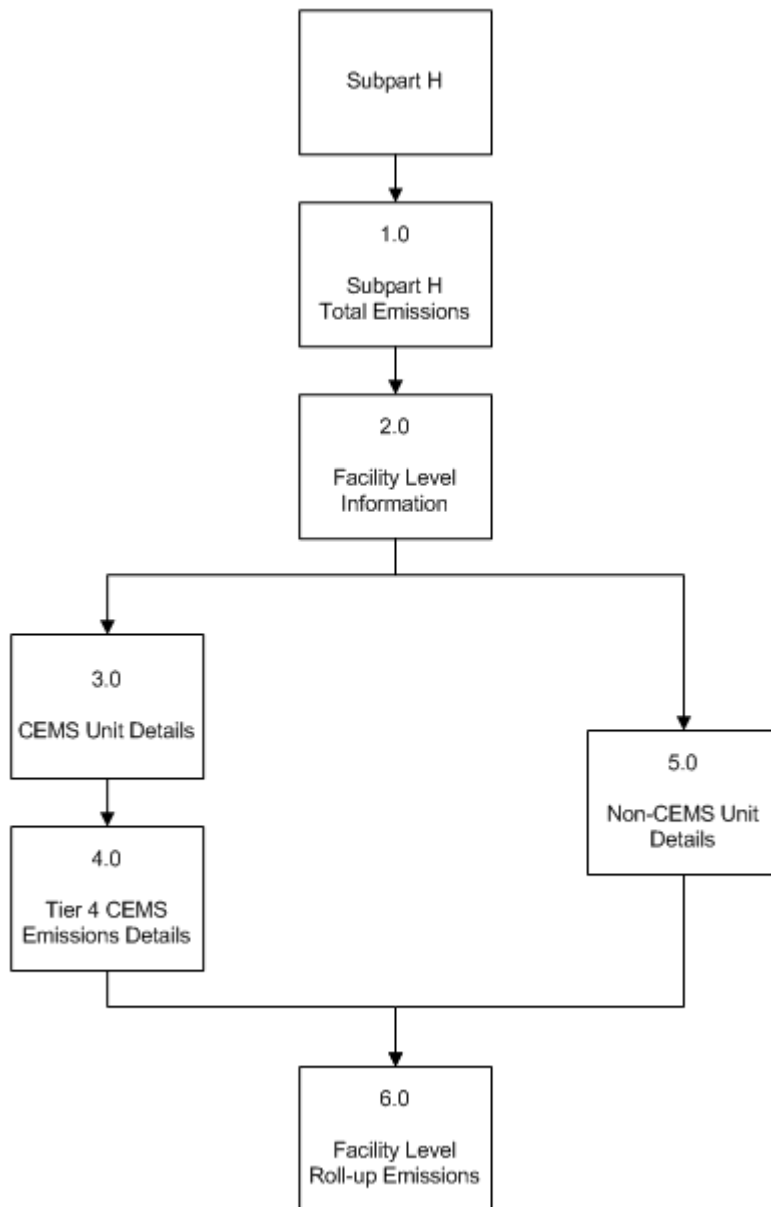
Document Changes:

3-15-2012 – Modified some of the emissions values within the XML excerpts to emphasize the rounding rules. Added a note to follow the rounding rules in Table 1. Added ParentCompanyDetails to sample XML document.

III. Subpart H Overview

This document provides a step-by-step description of how to report data for Subpart H Cement Production and overall total Subpart H greenhouse gas data for a facility using the XML schema.

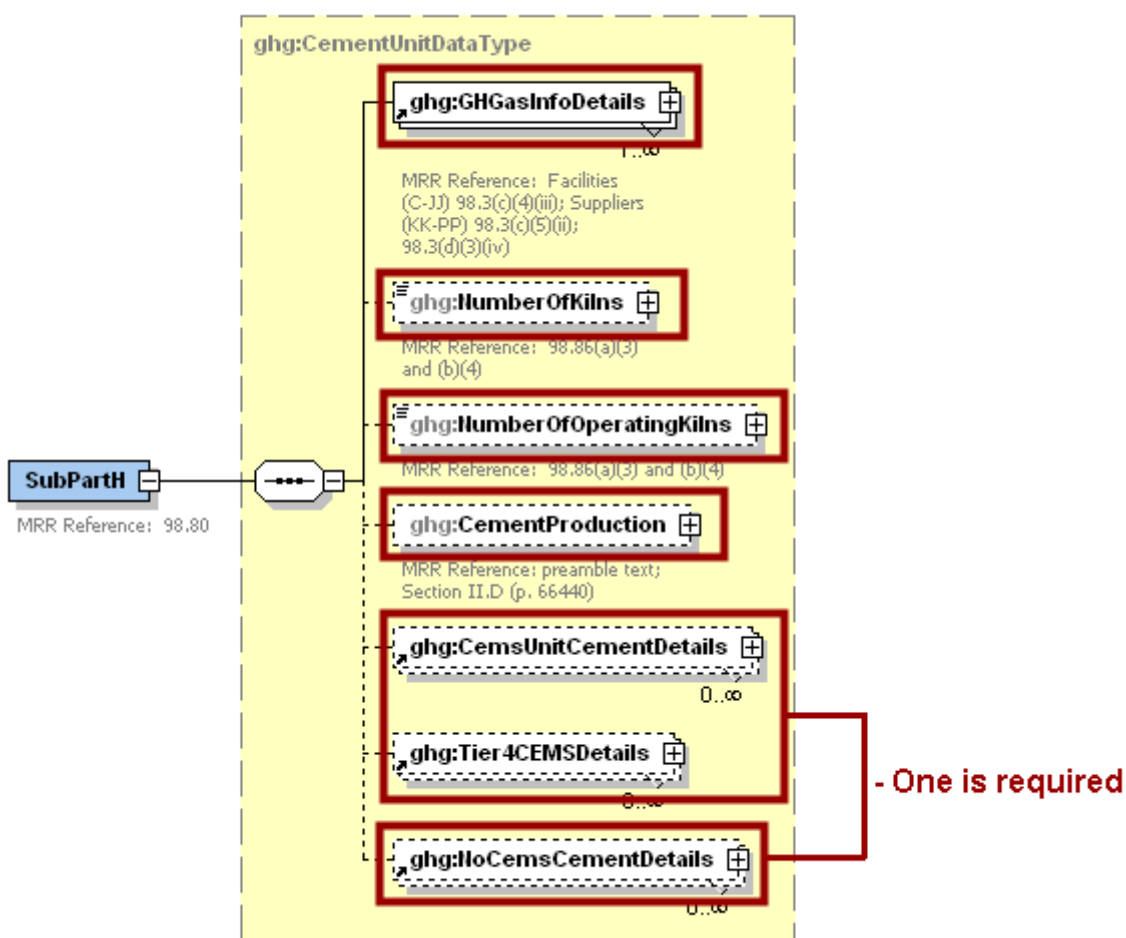
**Figure 7
Subpart H Reporting Diagram**



The XML schema includes the following areas for reporting for Subpart H, as diagrammed above:

- 1.0 Subpart H Total Emissions: includes the total emissions of CO₂, CH₄ and N₂O as reported under Subpart H.
- 2.0 Facility Level Information: includes number of kilns, number of operating kilns and annual cement production for the facility.
- 3.0 CEMS Unit Details: includes information on unit identification and monthly details on clinker production if using CEMS.
- 4.0 Tier 4 CEMS Emissions Details: includes information on each CEMS monitoring location and emissions details.
- 5.0 Non-CEMS Unit and Emissions Details: includes information on unit identification, monthly details on clinker production, quarterly details on cement kiln dust and annual raw material information.
- 6.0 Facility Level Roll-up Emissions: includes information on how to report total emissions for CO₂e (excluding biogenic CO₂) and biogenic CO₂ from Subpart H at the facility level.

**Figure 8
Subpart H Schema Diagram**

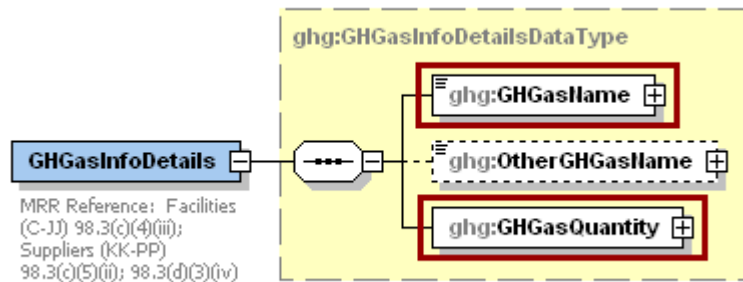


Note: Data elements boxed in red are required.

1.0 Subpart H 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 H, expressed in metric tons.

Figure 9
GHGasInfoDetails Details Schema Diagram



Note: Data elements boxed in red are required.

For Subpart H, report total emissions for carbon dioxide (excluding biogenic CO₂), biogenic carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). 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 annual CO₂ process emissions from cement manufacturing calculated from Equation H-1 for all kilns and
 - the total annual CO₂ mass emissions from kilns monitored by the CEMS minus the total annual biogenic CO₂ mass emissions for the CEMS monitoring location (CML) for each CML.
- For biogenic carbon dioxide, report the sum of the total annual biogenic CO₂ mass emissions for each CML.
- For methane, report the sum of the total CH₄ emissions for each CML.
- For nitrous oxide, report the sum of the total N₂O emissions for each CML.

Note: You must follow the rounding rules found in [Table 1](#).

Table 6
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 GHGs, part 98, reported under this subpart, expressed in metric tons.
GHGasName	Specify the name of the GHG. See list of allowable values: Carbon Dioxide Biogenic Carbon dioxide Methane Nitrous Oxide

Data Element Name	Description
GHGasQuantity	A collection of data elements that quantify the annual emissions from this source category. Report the calculated value and mass unit of measure according to the guidelines above only.
GHGasQuantity.massUOM	Metric Tons

XML Excerpt 2

Sample XML Excerpt for GHGasInfoDetails

```

<ghg:SubPartH>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Biogenic Carbon dioxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>150.9</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Methane</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>111.56</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Nitrous Oxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>11.567</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Carbon Dioxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>12355.8</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>

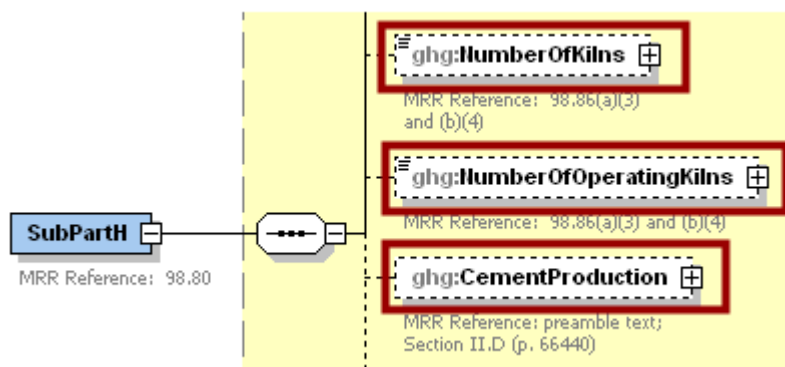
```

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

2.0 Facility Level Information

This section provides a description of how to report Subpart H facility information.

Figure 10
Facility Level Information Schema Diagram



Note: Data elements boxed in red are required.

The following facility level information must be reported:

- The total number of kilns at the facility.
- The total number of operating kilns at the facility.
- The annual cement production for the facility in short tons.

Table 7
Facility Level Information XML Data Elements

Data Element Name	Description
NumberOfKilns	Number of kilns at the facility.
NumberOfOperatingKilns	Number of operating kilns at the facility.
CementProduction	Annual cement production for the facility.
CementProduction.massUOM	Short Tons

XML Excerpt 3
Sample XML Excerpt for Facility Level Information

```
<ghg:NumberOfKilns>5</ghg:NumberOfKilns>
<ghg:NumberOfOperatingKilns>3</ghg:NumberOfOperatingKilns>
<ghg:CementProduction massUOM="Short Tons">
  <ghg:MeasureValue>987654321.7876</ghg:MeasureValue>
</ghg:CementProduction>
```

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 if a continuous emissions monitoring system (CEMS) was in use during the reporting year.

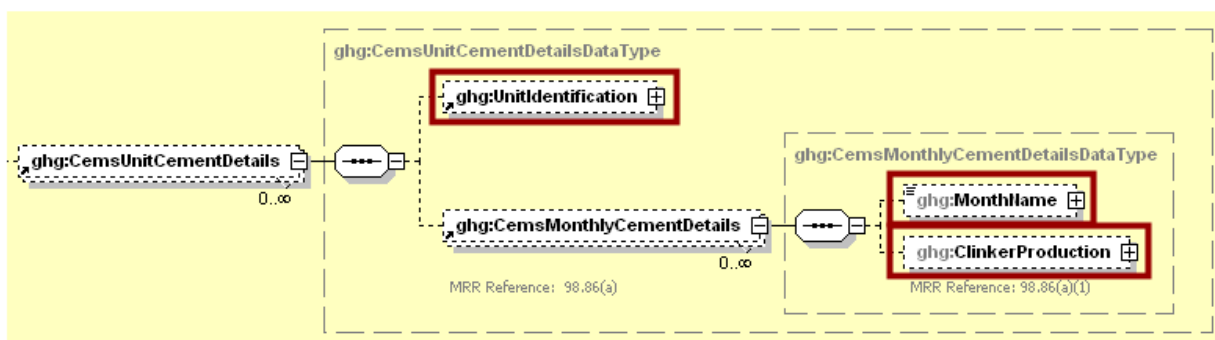
Subpart H requires the following identification information for each operating kiln that had emissions monitored using a CEMS:

- A unique unit name or identifier (e.g., a unit ID number).
- An optional unit description or label.
- A code representing the type of unit (Cement Kiln).

For each month and for each kiln, the facility must provide the following:

- Clinker production in short tons [98.86(a)(1)].
- An indication (Y/N) if a missing data procedure was used to determine the monthly clinker production [98.86(b)(14)(i)].

**Figure 11
CEMS Unit Details Schema Diagram**



Note: Data elements boxed in red are required.

**Table 8
CEMS Unit Details XML Data Elements**

Data Element Name	Description
CemsUnitCementDetails	A collection of data elements for each cement kiln that is monitored by CEMS.
UnitIdentification	A collection of data elements containing the identity of each cement kiln. It includes the unit ID, an optional description, and a code representing the type of unit, Cement Kiln.
CemsMonthlyCementDetails	A collection of monthly data elements for each cement kiln that is monitored by CEMS.

Data Element Name	Description
MonthName	The name of each month. See list of allowable values: January February March April May June July August September October November December
ClinkerProduction	Clinker production from the kiln for the month specified. Report the measured value and an indication (Y/N) if a missing data procedure was used to determine the monthly clinker production only.
ClinkerProduction.massUOM	Short Tons

XML Excerpt 4
Sample XML Excerpt for CEMS Unit Details

```

<ghg:CemsUnitCementDetails>
  <ghg:UnitIdentification>
    <ghg:UnitName>003- CEMS</ghg:UnitName>
    <ghg:UnitDescription>CEMS unit</ghg:UnitDescription>
    <ghg:UnitType>Cement Kiln</ghg:UnitType>
  </ghg:UnitIdentification>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>January</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>10.78976</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>February</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>20.34</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>March</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>30.78787</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>April</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>40.343</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>May</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>50.4</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
</ghg:CemsUnitCementDetails>

```

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

4.0 Tier 4 CEMS Emissions Details

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

Figure 12
Tier 4 CEMS Details Schema Diagram

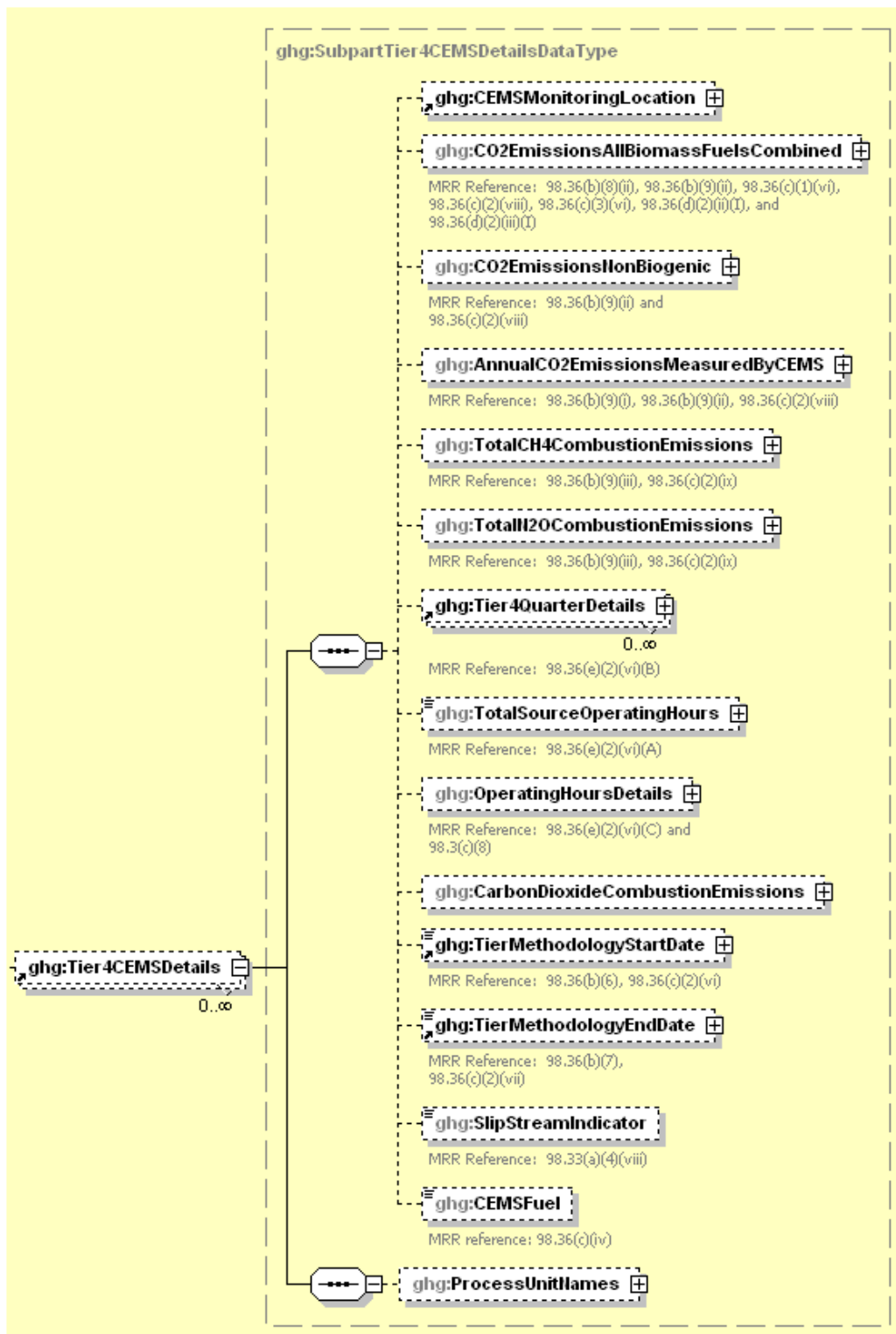


Figure 13
Tier 4 CEMS Location and Emissions Details Schema Diagram



Note: Data elements boxed in red are required.

For subpart H, 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 CO₂ mass emissions from combustion of all biomass fuels combined [98.36(b)(8)(ii)]
- The total annual non-biogenic CO₂ mass emissions (i.e. CO₂ mass emissions from fossil fuels, sorbent use, and process emissions) [98.36(b)(9)(ii)]
- The total annual CO₂ mass emissions measured by the CEMS [98.36(b)(9)(i)-(ii)]
- The total annual CH₄ mass emissions derived from Equation C-10, in metric tons CH₄ [98.36(b)(9)(iii), 98.36(c)(2)(ix)]
- The total annual N₂O mass emissions derived from Equation C-10, in metric tons N₂O [98.36(b)(9)(iii), 98.36(c)(2)(ix)]

Table 9
Tier 4 CEMS Location and Emissions Details XML Data Elements

Data Element Name	Description
Tier4CEMSDetails	
CEMSMonitoringLocation	<p>A collection of data elements containing information on each CEMS monitoring location. It includes the name, an optional description, and configuration type. See the list of allowable configuration types:</p> <p>Single process/process unit exhausts to dedicated stack Multiple processes/process units share common stack Process/stationary combustion units share common stack</p>
CO2EmissionsAllBiomassFuelsCombined	Total annual biogenic CO ₂ mass emissions for the CEMS monitoring location. Report the calculated value only.
CO2EmissionsAllBiomassFuelsCombined.massUOM	Metric Tons
CO2EmissionsNonBiogenic	The total annual non-biogenic CO ₂ mass emissions for the CEMS monitoring location. Report the calculated value only.
CO2EmissionsNonBiogenic.massUOM	Metric Tons
AnnualCO2EmissionsMeasuredByCEMS	The total annual CO ₂ mass emissions measured by the CEMS at the monitoring location. Report the calculated value only.
AnnualCO2EmissionsMeasuredByCEMS.massUOM	Metric Tons
TotalCH4CombustionEmissions	The annual CH ₄ mass emissions for the specified fuel combusted in the CEMS monitoring location configuration during the reporting year calculated using Equation C-10 expressed in mass of CH ₄ . Report the calculated value only.
TotalCH4CombustionEmissions.massUOM	Metric Tons
TotalN2OCombustionEmissions	The annual N ₂ O mass emissions for the specified fuel combusted in the CEMS monitoring location configuration during the reporting year calculated using Equation C-10 expressed in mass of N ₂ O. Report the calculated value only.
TotalN2OCombustionEmissions.massUOM	Metric Tons

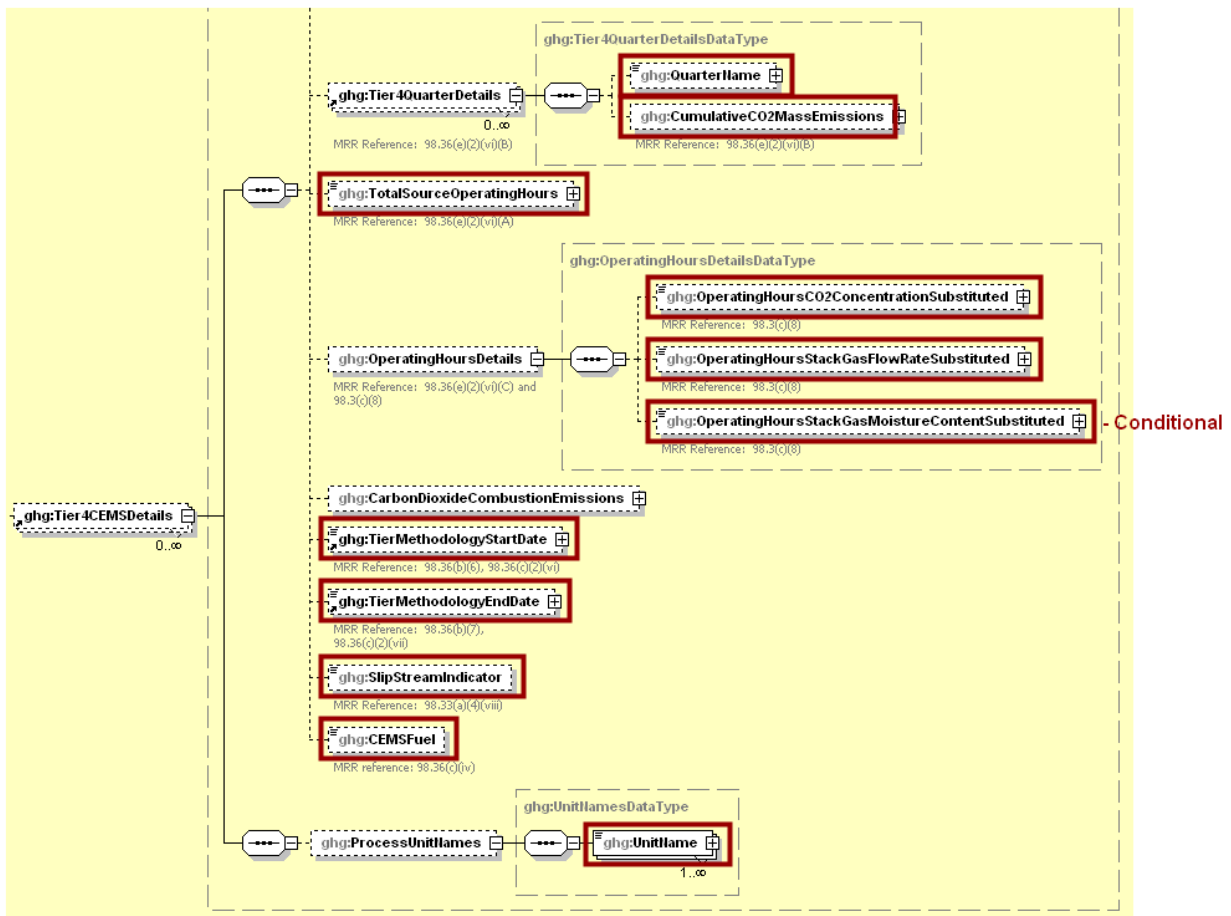
XML Excerpt 5 Sample XML Excerpt for Tier 4 CEMS Location and Emissions Details

```

<ghg:Tier4CEMSDetails>
  <ghg:CEMSMonitoringLocation>
    <ghg:Name>004- CML</ghg:Name>
    <ghg:Description>CEMS monitoring location 004</ghg:Description>
    <ghg:Type>Single process/process unit exhausts to dedicated stack</ghg:Type>
  </ghg:CEMSMonitoringLocation>
  <ghg:CO2EmissionsAllBiomassFuelsCombined massUOM="Metric Tons">
    <ghg:CalculatedValue>10065.1</ghg:CalculatedValue>
  </ghg:CO2EmissionsAllBiomassFuelsCombined>
  <ghg:CO2EmissionsNonBiogenic massUOM="Metric Tons">
    <ghg:CalculatedValue>10610.2</ghg:CalculatedValue>
  </ghg:CO2EmissionsNonBiogenic>
  <ghg:AnnualCO2EmissionsMeasuredByCEMS massUOM="Metric Tons">
    <ghg:CalculatedValue>20700.8</ghg:CalculatedValue>
  </ghg:AnnualCO2EmissionsMeasuredByCEMS>
  <ghg:TotalCH4CombustionEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>111.23</ghg:CalculatedValue>
  </ghg:TotalCH4CombustionEmissions>
  <ghg:TotalN2OCombustionEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>11.908</ghg:CalculatedValue>
  </ghg:TotalN2OCombustionEmissions>
</ghg:Tier4CEMSDetails>
    
```

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

Figure 14 Tier 4 CEMS Quarter and Additional Details Schema Diagram



Note: Data elements boxed in red are required.

For each quarter of the reporting year, the facility must provide the cumulative CO₂ 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 CO₂ 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.

Table 10
Tier 4 CEMS Quarter and Additional Details XML Data Elements

Data Element Name	Description
Tier4QuarterDetails	
QuarterName	The name of the quarter. See list of allowable values: First Quarter Second Quarter Third Quarter Fourth Quarter
CumulativeCO2MassEmissions	The cumulative CO ₂ mass emissions for the specified quarter of the reporting year. Report the calculated value only.
CumulativeCO2MassEmissions.massUOM	Metric Tons
TotalSourceOperatingHours	The total number of source operating hours in the reporting year.
OperatingHoursDetails	
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.

Data Element Name	Description
TierMethodologyStartDate	The Tier 4 methodology start date for the specified CEMS monitoring location.
TierMethodologyEndDate	The Tier 4 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. Report each unit separately.

XML Excerpt 6
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>10000.2</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg:Tier4QuarterDetails>
  <ghg:QuarterName>Second Quarter</ghg:QuarterName>
  <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>20000.9</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg:Tier4QuarterDetails>
  <ghg:QuarterName>Third Quarter</ghg:QuarterName>
  <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>30000.5</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg:Tier4QuarterDetails>
  <ghg:QuarterName>Fourth Quarter</ghg:QuarterName>
  <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
    <ghg:CalculatedValue>40000.4</ghg:CalculatedValue>
  </ghg:CumulativeCO2MassEmissions>
</ghg:Tier4QuarterDetails>
<ghg>TotalSourceOperatingHours>10</ghg>TotalSourceOperatingHours>
<ghg:OperatingHoursDetails>
  <ghg:OperatingHoursCO2ConcentrationSubstituted>11</ghg:OperatingHoursCO2ConcentrationSubstituted>
  <ghg:OperatingHoursStackGasFlowRateSubstituted>12</ghg:OperatingHoursStackGasFlowRateSubstituted>
  <ghg:OperatingHoursStackGasMoistureContentSubstituted>13</ghg:OperatingHoursStackGasMoistureContentSubstituted>
</ghg:OperatingHoursDetails>
<ghg:TierMethodologyStartDate>2011-01-01</ghg:TierMethodologyStartDate>
<ghg:TierMethodologyEndDate>2011-12-31</ghg:TierMethodologyEndDate>
<ghg:SlipStreamIndicator>Y</ghg:SlipStreamIndicator>
<ghg:CEMSFuel>coal, coke, natural gas</ghg:CEMSFuel>
<ghg:ProcessUnitNames>
  <ghg:UnitName>003-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.

5.0 Non-CEMS Unit Details

This section describes information that must be reported for cement kilns which were not monitored by CEMS during the reporting year.

Figure 15
Non-CEMS Cement Details Schema Diagram

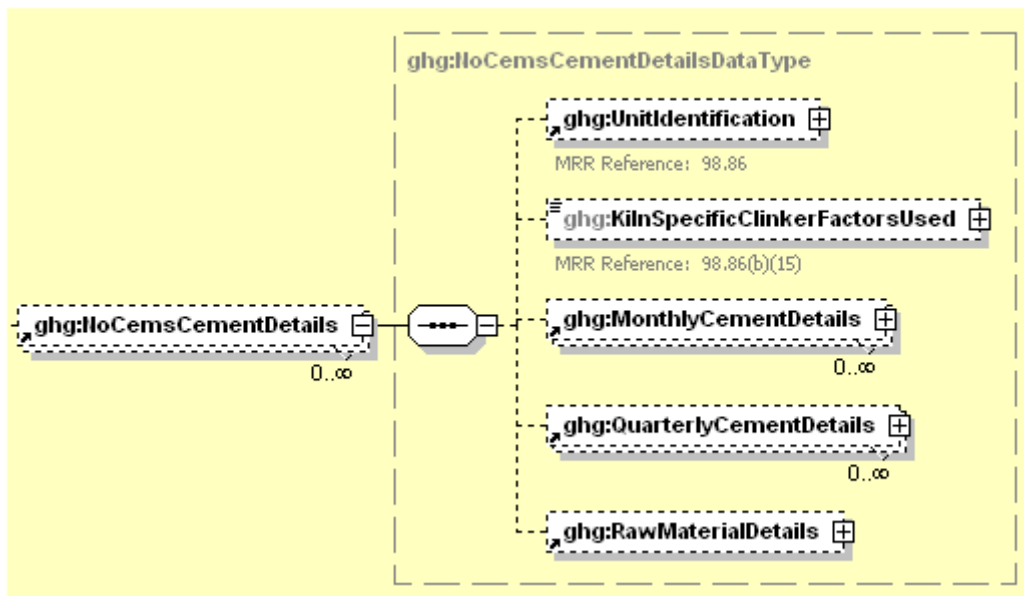
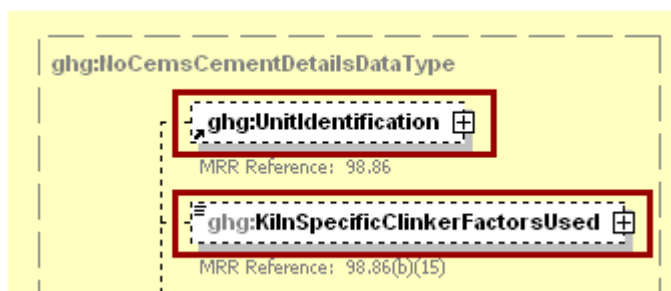


Figure 16
Non-CEMS Unit Details Schema Diagram



Note: Data elements boxed in red are required.

Subpart H requires the following identification information for each operating kiln which was not monitored by CEMS:

- A unique unit name or identifier (e.g., a unit ID number).
- An optional unit description or label.
- A code representing the type of unit (Cement Kiln).

The facility must provide for each kiln an indication if monthly kiln-specific clinker factors were used to determine monthly clinker production [98.86(b)(15)]

**Table 11
Non-CEMS Unit Details XML Data Elements**

Data Element Name	Description
NoCemsCementDetails	
UnitIdentification	A collection of data elements containing the identity of each cement kiln. It includes the unit ID, an optional description, and a code representing the type of unit (Cement Kiln).
KilnSpecificClinkerFactorsUsed	Report an indication (Y/N) of whether kiln specific clinker factors were used to determine monthly clinker production.

**XML Excerpt 7
Sample XML Excerpt for Non-CEMS Unit Details**

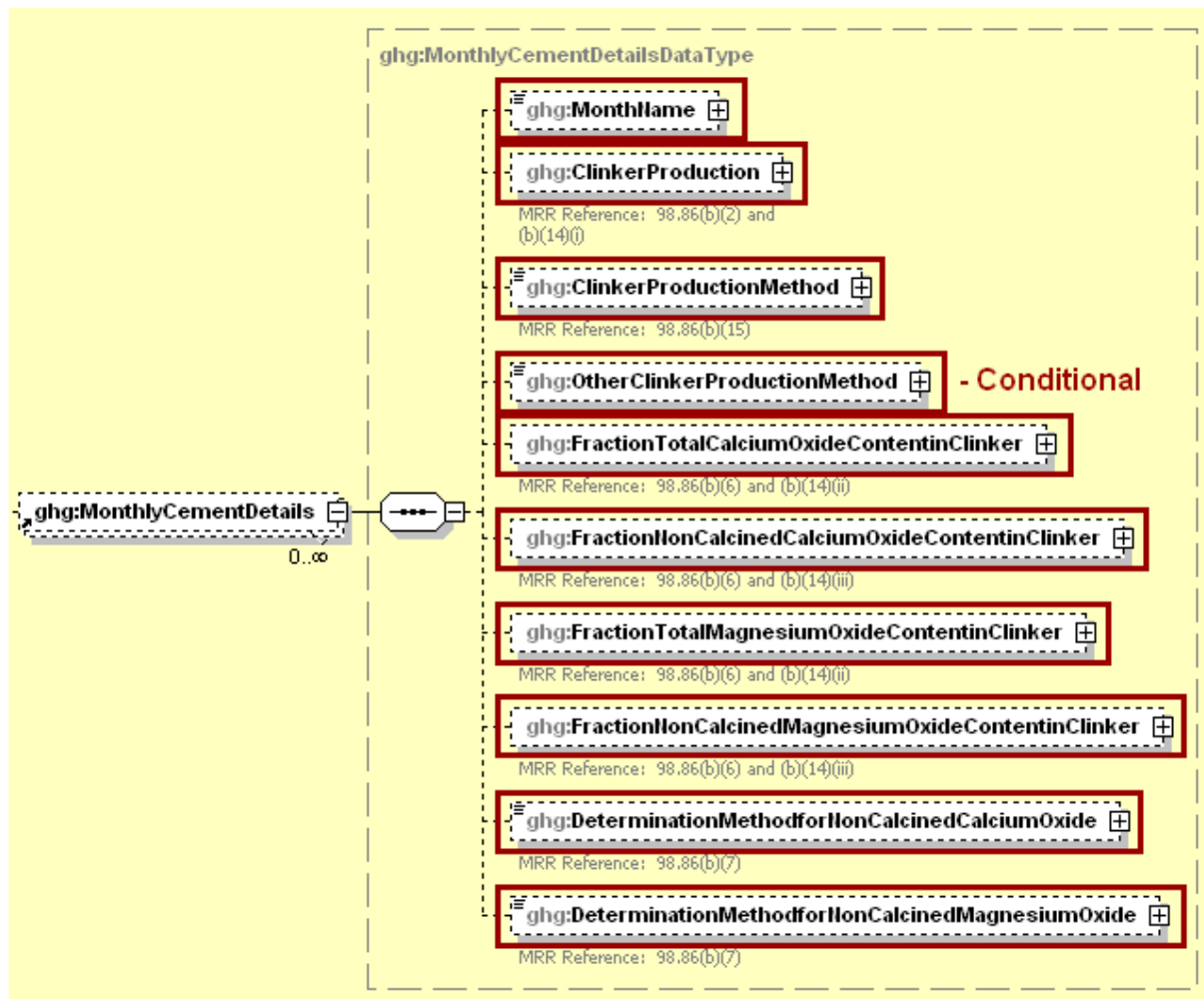
```

<ghg:NoCemsCementDetails>
  <ghg:UnitIdentification>
    <ghg:UnitName>001- Non-CEMS RM</ghg:UnitName>
    <ghg:UnitDescription>Non-CEMS, based on consumption of raw material</ghg:UnitDescription>
    <ghg:UnitType>Cement Kiln</ghg:UnitType>
  </ghg:UnitIdentification>
  <ghg:KilnSpecificClinkerFactorsUsed>Y</ghg:KilnSpecificClinkerFactorsUsed>

```

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

Figure 17
Non-CEMS Monthly Details Schema Diagram



Note: Data elements boxed in red are required.

For each month and for each kiln, the facility must provide the following:

- An indication if a missing data procedure was used to determine the monthly clinker production [98.86(b)(14)(i)]
- The method used to determine the monthly clinker production [98.86(b)(15)]
- An indication if a missing data procedure was used to determine the fraction of total CaO in clinker [98.86(b)(14)(ii)]
- An indication if a missing data procedure was used to determine the fraction of non-calcined CaO in clinker [98.86(b)(14)(iii)]
- An indication if a missing data procedure was used to determine the fraction of total MgO in clinker [98.86(b)(14)(ii)]
- An indication if a missing data procedure was used to determine the fraction of non-calcined MgO in clinker [98.86(b)(14)(iii)]
- The method used to determine the fraction of non-calcined CaO in clinker [98.86(b)(7)] (See 98.84(g) for more information on applicable methods.)
- The method used to determine the fraction of non-calcined MgO in clinker [98.86(b)(7)] (See 98.84(g) for more information on applicable methods.)

Table 12
Non-CEMS Monthly Details XML Data Elements

Data Element Name	Description
MonthlyCementDetails	
MonthName	Month name. See list of allowable values: January February March April May June July August September October November December
ClinkerProduction	Report an indication (Y/N) if missing data procedures were used to determine clinker production for the month specified.
ClinkerProductionMethod	Clinker production method used for the month specified. See list of allowable values: Direct measurement Kiln specific feed-to-clinker ratio Other Did not operate
OtherClinkerProductionMethod	The description of the clinker production method for the month if "Other" was specified for clinker production method.
FractionTotalCalciumOxideContentinClinker	Report an indication (Y/N) if missing data procedures were used to determine the fraction of total CaO in clinker for the month specified.
FractionNonCalcinedCalciumOxideContentinClinker	Report an indication (Y/N) if missing data procedures were used to determine the fraction of non-calcined CaO in clinker for the month specified.
FractionTotalMagnesiumOxideContentinClinker	Report an indication (Y/N) if missing data procedures were used to determine the fraction of total MgO in clinker for the month specified.
FractionNonCalcinedMagnesiumOxideContentinClinker	Report an indication (Y/N) if missing data procedures were used to determine the fraction of non-calcined MgO in clinker for the month specified.
DeterminationMethodforNonCalcinedCalciumOxide	Specify the method used to determine the fraction of non-calcined CaO in clinker for the month.

Data Element Name	Description
DeterminationMethodforNonCalcinedMagnesiumOxide	Specify the method used to determine the fraction of non-calcined MgO in clinker for the month.

XML Excerpt 8 Sample XML Excerpt for Non-CEMS Monthly Details

```

<ghg:MonthlyCementDetails>
  <ghg:MonthName>January</ghg:MonthName>
  <ghg:ClinkerProduction>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:ClinkerProduction>
  <ghg:ClinkerProductionMethod>Direct measurement</ghg:ClinkerProductionMethod>
  <ghg:FractionTotalCalciumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionTotalCalciumOxideContentinClinker>
  <ghg:FractionNonCalcinedCalciumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionNonCalcinedCalciumOxideContentinClinker>
  <ghg:FractionTotalMagnesiumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionTotalMagnesiumOxideContentinClinker>
  <ghg:FractionNonCalcinedMagnesiumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionNonCalcinedMagnesiumOxideContentinClinker>
  <ghg:DeterminationMethodforNonCalcinedCalciumOxide>Method
  C</ghg:DeterminationMethodforNonCalcinedCalciumOxide>
  <ghg:DeterminationMethodforNonCalcinedMagnesiumOxide>Method
  D</ghg:DeterminationMethodforNonCalcinedMagnesiumOxide>
</ghg:MonthlyCementDetails>
<ghg:MonthlyCementDetails>
  <ghg:MonthName>February</ghg:MonthName>
  <ghg:ClinkerProduction>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:ClinkerProduction>
  <ghg:ClinkerProductionMethod>Direct measurement</ghg:ClinkerProductionMethod>
  <ghg:FractionTotalCalciumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionTotalCalciumOxideContentinClinker>
  <ghg:FractionNonCalcinedCalciumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionNonCalcinedCalciumOxideContentinClinker>
  <ghg:FractionTotalMagnesiumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionTotalMagnesiumOxideContentinClinker>
  <ghg:FractionNonCalcinedMagnesiumOxideContentinClinker>
    <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
  </ghg:FractionNonCalcinedMagnesiumOxideContentinClinker>
  <ghg:DeterminationMethodforNonCalcinedCalciumOxide>Method
  C</ghg:DeterminationMethodforNonCalcinedCalciumOxide>
  <ghg:DeterminationMethodforNonCalcinedMagnesiumOxide>Method
  D</ghg:DeterminationMethodforNonCalcinedMagnesiumOxide>
</ghg:MonthlyCementDetails>

```

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

Figure 18
Non-CEMS Quarterly Details Schema Diagram



Note: Data elements boxed in red are required.

For each quarter and each kiln, the facility must provide the following:

- An indication if a missing data procedure was used to determine the quantity of cement kiln dust (CKD) not recycled to the kiln [98.86(b)(14)(iv)].
- An indication if a missing data procedure was used to determine the fraction of non-calcined CaO in CKD not recycled to the kiln [98.86(b)(14)(v)].
- An indication if a missing data procedure was used to determine the fraction of non-calcined MgO in CKD not recycled to the kiln [98.86(b)(14)(v)].
- The method used to determine the fraction of non-calcined CaO in CKD not recycled to the kiln [98.86(b)(9)].
- The method used to determine the fraction of non-calcined MgO in CKD not recycled to the kiln [98.86(b)(9)].

Table 13
Non-CEMS Quarterly Details XML Data Elements

Data Element Name	Description
QuarterlyCementDetails	
QuarterName	Specify the quarter. See list of allowable values: First Quarter Second Quarter Third Quarter Fourth Quarter
CementKilnDustNotRecycledtoKiln	Report an indication (Y/N) if missing data procedures were used to determine the quantity of cement kiln dust not recycled to the kiln for the quarter specified.
FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled	Report an indication (Y/N) if missing data procedures were used to determine the fraction of non-calcined CaO in cement kiln dust not recycled to the kiln for the quarter specified.
FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled	Report an indication (Y/N) if missing data procedures were used to determine the fraction of non-calcined MgO in cement kiln dust not recycled to the kiln for the quarter specified.
DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust	Specify the determination method for non-calcined calcium oxide in cement kiln dust. See list of allowable values: Default of 0.0 Other Did not operate this quarter
OtherDeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust	Specify the determination method for non-calcined calcium oxide in cement kiln dust if "Other" was specified.
DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust	Specify the determination method for non-calcined magnesium oxide in cement kiln dust. See list of allowable values: Default of 0.0 Other Did not operate this quarter
OtherDeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust	Specify the determination method for non-calcined magnesium oxide in cement kiln dust if "Other" was specified.

XML Excerpt 9 Sample XML Excerpt for Non-CEMS Quarterly Details

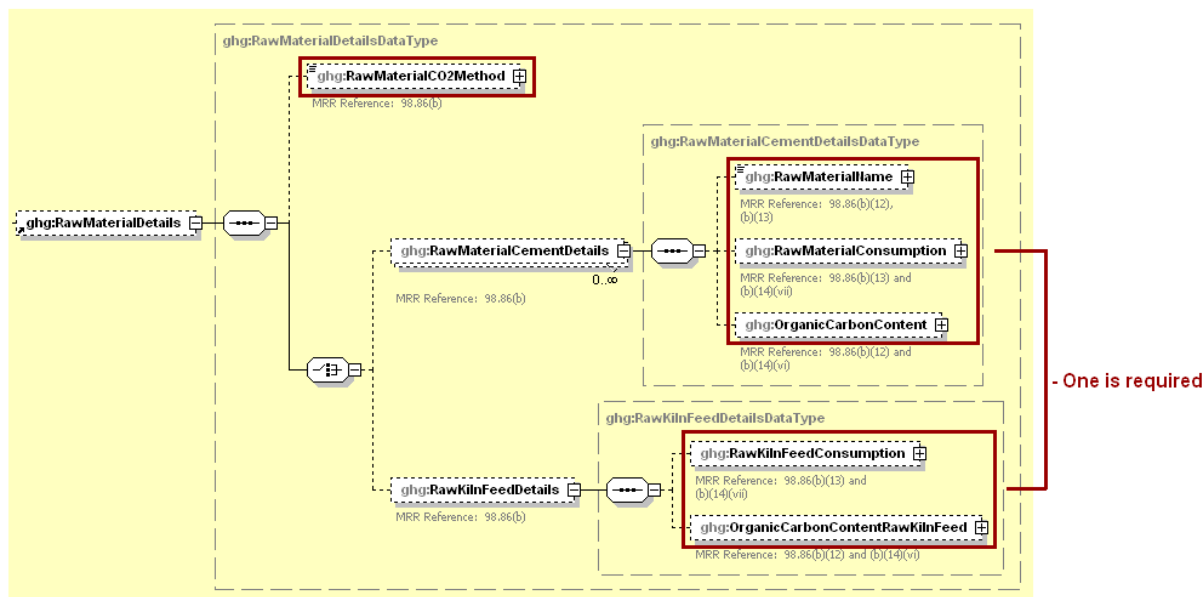
```

<ghg: QuarterlyCementDetails>
  <ghg: QuarterName>First Quarter</ghg: QuarterName>
  <ghg: CementKilnDustNotRecycledtoKiln>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: CementKilnDustNotRecycledtoKiln>
  <ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
  <ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
  <ghg: DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>Default of
  0.0</ghg: DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>
  <ghg: DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>Other</ghg: DeterminationMethodforNonCalc
  inedMagnesiumOxideinCementKilnDust>
  <ghg: OtherDeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>Method
  A</ghg: OtherDeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>
</ghg: QuarterlyCementDetails>
<ghg: QuarterlyCementDetails>
  <ghg: QuarterName>Second Quarter</ghg: QuarterName>
  <ghg: CementKilnDustNotRecycledtoKiln>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: CementKilnDustNotRecycledtoKiln>
  <ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
  <ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
  <ghg: DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>Did not operate this
  quarter</ghg: DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>
  <ghg: DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>Did not operate this
  quarter</ghg: DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>
</ghg: QuarterlyCementDetails>
<ghg: QuarterlyCementDetails>
  <ghg: QuarterName>Third Quarter</ghg: QuarterName>
  <ghg: CementKilnDustNotRecycledtoKiln>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: CementKilnDustNotRecycledtoKiln>
  <ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
  <ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
  <ghg: DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>Default of
  0.0</ghg: DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>
  <ghg: DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>Default of
  0.0</ghg: DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>
</ghg: QuarterlyCementDetails>
<ghg: QuarterlyCementDetails>
  <ghg: QuarterName>Fourth Quarter</ghg: QuarterName>
  <ghg: CementKilnDustNotRecycledtoKiln>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: CementKilnDustNotRecycledtoKiln>
  <ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedCalciumOxideInCementKilnDustNotRecycled>
  <ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
    <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
  </ghg: FractionNonCalcinedMagnesiumOxideInCementKilnDustNotRecycled>
  <ghg: DeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>Other</ghg: DeterminationMethodforNonCalcine
  dCalciumOxideinCementKilnDust>
  <ghg: OtherDeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>Method
  B</ghg: OtherDeterminationMethodforNonCalcinedCalciumOxideinCementKilnDust>
  <ghg: DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>Default of
  0.0</ghg: DeterminationMethodforNonCalcinedMagnesiumOxideinCementKilnDust>
</ghg: QuarterlyCementDetails>

```

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

Figure 19
Raw Material Details Schema Diagram



Note: Data elements boxed in red are required.

The facility must indicate for each kiln if annual CO₂ emissions from raw materials were estimated:

- 1) based on consumption of individual raw materials or
- 2) based on the amount of raw kiln feed consumed annually.

Required information is based on the method indicated above:

- 1) For each kiln which the facility indicated that annual CO₂ emissions from raw materials are to be based on consumption of individual raw materials, the facility must provide a unique identifier/description for each raw material consumed in the kiln during the reporting year [98.86(b)(12) and 98.86(b)(13)].

For each raw material, the facility must provide the following:

- The number of months a missing data procedure was used to determine a monthly quantity of the raw material consumed used in the determination of the annual consumption quantity [98.86(b)(14)(vii)].
 - The number of times a missing data procedure was used to determine the annual organic carbon content of the raw material feed [98.86(b)(14)(vi)].
- 2) For each kiln for which the facility indicated that annual CO₂ emissions from raw materials are to be based on raw kiln feed, the facility must provide the following:
 - The number of months a missing data procedure was used to determine a monthly quantity of raw kiln feed consumption used in the determination of the annual consumption quantity [98.86(b)(14)(vii)].
 - The number of times a missing data procedure was used to determine the annual organic carbon content of the raw kiln feed [98.86(b)(14)(vi)].

Table 14
Raw Material Details XML Data Elements

Data Element Name	Description
RawMaterialDetails	
RawMaterialCO2Method	<p>Specify the method used to estimate annual CO₂ emissions from the kiln specified. See list of allowable values:</p> <ul style="list-style-type: none"> Raw kiln feed Individual raw materials
RawMaterialCementDetails	A collection of data elements to report if “Individual raw materials” was indicated.
RawMaterialName	Specify the name of each raw material consumed by the kiln separately.
RawMaterialConsumption	Report the number of months a missing data procedure was used to determine a monthly quantity of the raw material consumed used in the determination of the annual consumption quantity of the raw material specified.
OrganicCarbonContent	Report the number of times a missing data procedure was used to determine the annual organic carbon content of the raw material feed specified (0 or 1).
RawKilnFeedDetails	A collection of data elements to report if “Raw kiln feed” was indicated.
RawKilnFeedConsumption	Report the number of months a missing data procedure was used to determine a monthly quantity of raw kiln feed consumption used in the determination of the annual consumption quantity.
OrganicCarbonContentRawKilnFeed	Report the number of times a missing data procedure was used to determine the annual organic carbon content of the raw kiln feed (0 or 1).

XML Excerpt 10

Sample XML Excerpt for Raw Material Details

Individual raw materials:

```

<ghg:RawMaterialDetails>
  <ghg:RawMaterialCO2Method>Individual raw materials</ghg:RawMaterialCO2Method>
  <ghg:RawMaterialCementDetails>
    <ghg:RawMaterialName>raw material 1</ghg:RawMaterialName>
    <ghg:RawMaterialConsumption>
      <ghg:NumberOfTimesSubstituted>6</ghg:NumberOfTimesSubstituted>
    </ghg:RawMaterialConsumption>
    <ghg:OrganicCarbonContent>
      <ghg:NumberOfTimesSubstituted>0</ghg:NumberOfTimesSubstituted>
    </ghg:OrganicCarbonContent>
  </ghg:RawMaterialCementDetails>
</ghg:RawMaterialDetails>

```

Raw kiln feed:

```

<ghg:RawMaterialDetails>
  <ghg:RawMaterialCO2Method>Raw kiln feed</ghg:RawMaterialCO2Method>
  <ghg:RawKilnFeedDetails>
    <ghg:RawKilnFeedConsumption>
      <ghg:NumberOfTimesSubstituted>4</ghg:NumberOfTimesSubstituted>
    </ghg:RawKilnFeedConsumption>
    <ghg:OrganicCarbonContentRawKilnFeed>
      <ghg:NumberOfTimesSubstituted>1</ghg:NumberOfTimesSubstituted>
    </ghg:OrganicCarbonContentRawKilnFeed>
  </ghg:RawKilnFeedDetails>
</ghg:RawMaterialDetails>

```

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

6.0 Facility Level Roll-up Emissions

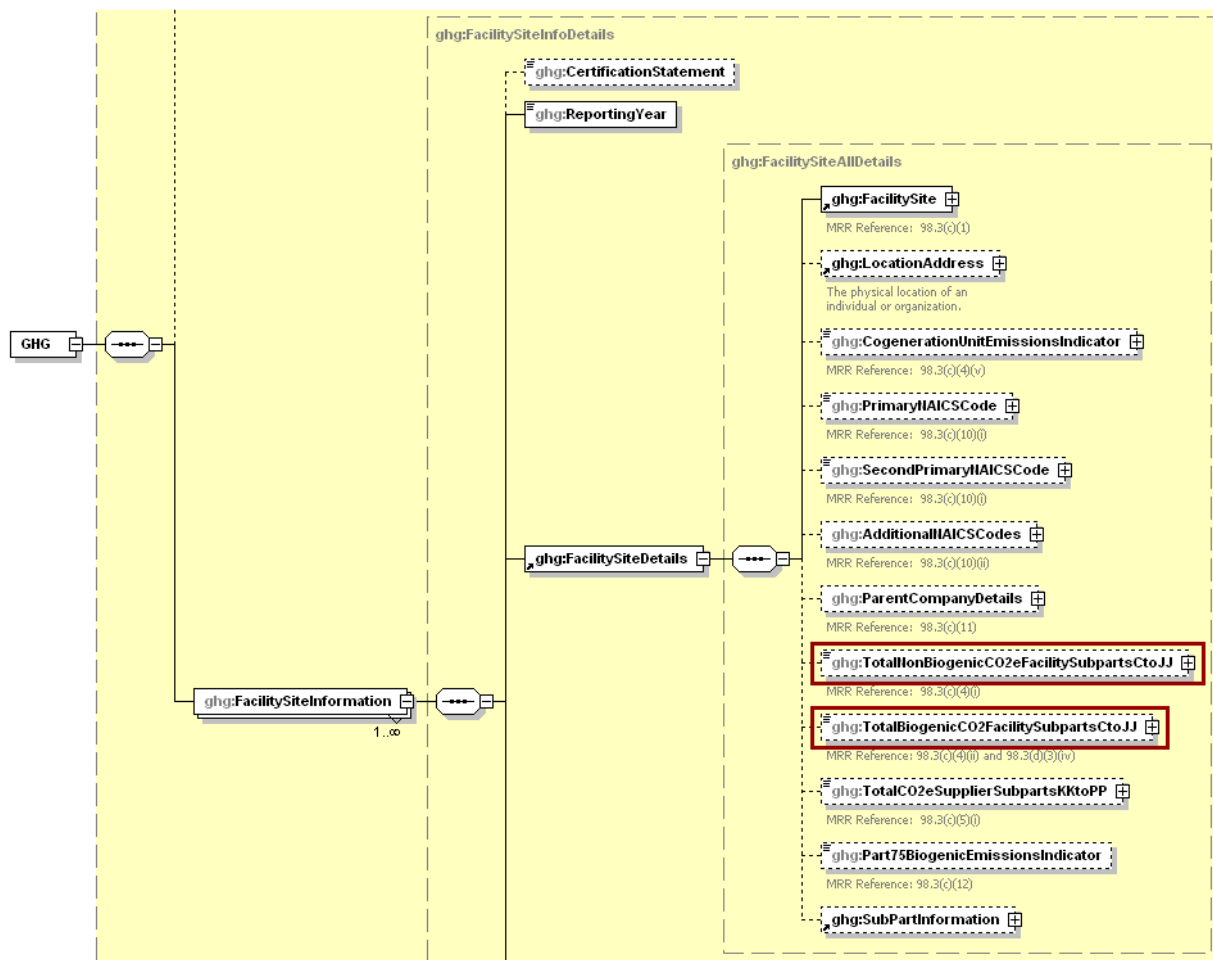
Each facility must report the following facility-level emission totals:

- Total CO₂ equivalent (CO₂e) emissions (excluding biogenic CO₂) aggregated across all direct emitter source categories (subparts C-HH) associated with the facility.
- Total biogenic CO₂ emissions aggregated across all direct emitter source categories (subparts C-HH) associated with the facility.

Each supplier must report the following supplier totals:

- Total CO₂e associated with products supplied aggregated across subparts NN, OO and PP (as applicable). **Note:** Do not include subpart LL and MM totals in this data element as these values are not being collected in e-GGRT.

Figure 20
Facility Level Roll-up Emissions Schema Diagram



Note: Data elements boxed in red are required.

- 1) Add the total CO₂e value for subpart H in metric tons to the total CO₂e emissions (excluding biogenic CO₂) aggregated across all source category subparts associated with the facility according to the following guidelines:

- Add the annual CO₂ process emissions from cement manufacturing (H-1, all kilns) in metric tons.
 - Add the total annual CO₂ mass emissions measured by the CEMS in metric tons minus the total annual biogenic CO₂ mass emissions for the CML in metric tons (the difference of the total CO₂ monitored by the CEMS and the total biogenic CO₂) for each CML.
 - Multiply the total CH₄ emissions in metric tons by the Global Warming Potential for CH₄ (21) for each CML and add the resulting value.
 - Multiply the total N₂O emissions in metric tons by the Global Warming Potential for N₂O (310) for each CML and add the resulting value.
- 2) Add the total annual biogenic CO₂ mass emissions for the CML in metric tons for each CML to the total biogenic CO₂ aggregated across all source category subparts associated with the facility.

Note: You must follow the rounding rules found in [Table 1](#).

Table 15
Facility Level Roll-up Emissions XML Data Elements

Data Element Name	Description
TotalNonBiogenicCO2eFacilitySubpartsCtoJJ	Add the total CO ₂ e value for subpart H in metric tons to the total CO ₂ e emissions (excluding biogenic CO ₂) aggregated across all source category subparts associated with the facility according to the guidelines above. [98.3(c)(4)(i)]
TotalNonBiogenicCO2eFacilitySubpartsCtoJJ.massUOM	Metric Tons
TotalBiogenicCO2FacilitySubpartsCtoJJ	Add the total annual biogenic CO ₂ value for subpart H 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. [98.3(c)(4)(ii) and 98.3(d)(3)(iv)]
TotalBiogenicCO2FacilitySubpartsCtoJJ.massUOM	Metric Tons

XML Excerpt 11
Sample XML Excerpt for Facility Level Roll-up Emissions

```

<ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric Tons">123522.2</ghg:TotalNonBiogenicCO2eFacilitySubpartsCtoJJ>
<ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">158.4</ghg:TotalBiogenicCO2FacilitySubpartsCtoJJ>

```

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

IV. Appendix A: Sample XML Document for Subpart H

(Note: Data values do not reflect an actual facility's emissions. Additional sample XML files for Subpart H are posted on the e-GGRT help site.)

```

<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>2011</ghg:ReportingYear>
    <ghg:FacilitySiteDetails>
      <ghg:FacilitySite>
        <ghg:FacilitySiteIdentifier>524337</ghg:FacilitySiteIdentifier>
        <ghg:FacilitySiteName>Test Facility H</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>Y</ghg:CogenerationUnitEmissionsIndicator>
      <ghg:PrimaryNAICSCode>327310</ghg:PrimaryNAICSCode>
      <ghg:ParentCompanyDetails>
        <ghg:ParentCompany>
          <ghg:ParentCompanyLegalName>Soda Ash Corporation</ghg:ParentCompanyLegalName>
          <ghg:StreetAddress>108 Hillcrest Street</ghg:StreetAddress>
          <ghg:City>Sandpoint</ghg:City>
          <ghg:State>ID</ghg:State>
          <ghg:Zip>83864</ghg:Zip>
          <ghg:PercentOwnershipInterest>100.0</ghg:PercentOwnershipInterest>
        </ghg:ParentCompany>
      </ghg:ParentCompanyDetails>
      <ghg>TotalNonBiogenicCO2eFacilitySubpartsCtoJJ massUOM="Metric Tons">123562380.3</ghg>TotalNonBiogenicCO2eFacilitySubpartsCtoJJ>
      <ghg>TotalBiogenicCO2FacilitySubpartsCtoJJ massUOM="Metric Tons">150.4</ghg>TotalBiogenicCO2FacilitySubpartsCtoJJ>
      <ghg>TotalCO2eSupplierSubpartsKktoPP massUOM="Metric Tons">0</ghg>TotalCO2eSupplierSubpartsKktoPP>
      <ghg:SubPartInformation>
        <ghg:SubPartH>
          <ghg:GHGasInfoDetails>
            <ghg:GHGasName>Biogenic Carbon dioxide</ghg:GHGasName>
            <ghg:GHGasQuantity massUOM="Metric Tons">
              <ghg:CalculatedValue>150.1</ghg:CalculatedValue>
            </ghg:GHGasQuantity>
          </ghg:GHGasInfoDetails>
          <ghg:GHGasInfoDetails>
            <ghg:GHGasName>Methane</ghg:GHGasName>
          </ghg:GHGasInfoDetails>
        </ghg:SubPartH>
      </ghg:SubPartInformation>
    </ghg:FacilitySiteDetails>
  </ghg:FacilitySiteInformation>
</ghg:GHG>

```

```

        <ghg:GHGasQuantity massUOM="Metric Tons">
          <ghg:CalculatedValue>111.34</ghg:CalculatedValue>
        </ghg:GHGasQuantity>
      </ghg:GHGasInfoDetails>
    <ghg:GHGasInfoDetails>
      <ghg:GHGasName>Nitrous Oxide</ghg:GHGasName>
      <ghg:GHGasQuantity massUOM="Metric Tons">
        <ghg:CalculatedValue>11.456</ghg:CalculatedValue>
      </ghg:GHGasQuantity>
    </ghg:GHGasInfoDetails>
  <ghg:GHGasInfoDetails>
    <ghg:GHGasName>Carbon Dioxide</ghg:GHGasName>
    <ghg:GHGasQuantity massUOM="Metric Tons">
      <ghg:CalculatedValue>123556639.3</ghg:CalculatedValue>
    </ghg:GHGasQuantity>
  </ghg:GHGasInfoDetails>
<ghg:NumberOfKilns>5</ghg:NumberOfKilns>
<ghg:NumberOfOperatingKilns>3</ghg:NumberOfOperatingKilns>
<ghg:CementProduction massUOM="Short Tons">
  <ghg:MeasureValue>987654321.23456</ghg:MeasureValue>
</ghg:CementProduction>
<ghg:CemsUnitCementDetails>
  <ghg:UnitIdentification>
    <ghg:UnitName>003- CEMS</ghg:UnitName>
    <ghg:UnitDescription>CEMS unit</ghg:UnitDescription>
    <ghg:UnitType>Cement Kiln</ghg:UnitType>
  </ghg:UnitIdentification>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>January</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>10.09876</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>February</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>20.235</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>March</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>30.675</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>
  <ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>April</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
      <ghg:MeasureValue>40.234</ghg:MeasureValue>
      <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
  </ghg:CemsMonthlyCementDetails>

```

```

        </ghg:ClinkerProduction>
    </ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>May</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
        <ghg:MeasureValue>50.23</ghg:MeasureValue>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
</ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>June</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
        <ghg:MeasureValue>60.54</ghg:MeasureValue>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
</ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>July</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
        <ghg:MeasureValue>70.456789</ghg:MeasureValue>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
</ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>August</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
        <ghg:MeasureValue>80.23</ghg:MeasureValue>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
</ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>September</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
        <ghg:MeasureValue>90.097</ghg:MeasureValue>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
</ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>October</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
        <ghg:MeasureValue>100</ghg:MeasureValue>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
</ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>November</ghg:MonthName>
    <ghg:ClinkerProduction massUOM="Short Tons">
        <ghg:MeasureValue>110.876</ghg:MeasureValue>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:ClinkerProduction>
</ghg:CemsMonthlyCementDetails>
<ghg:CemsMonthlyCementDetails>
    <ghg:MonthName>December</ghg:MonthName>

```

```

        <ghg:ClinkerProduction massUOM="Short Tons">
          <ghg:MeasureValue>120.345672</ghg:MeasureValue>
          <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
        </ghg:ClinkerProduction>
      </ghg:CemsMonthlyCementDetails>
    </ghg:CemsUnitCementDetails>
  <ghg:Tier4CEMSDetails>
    <ghg:CEMSMonitoringLocation>
      <ghg:Name>004- CML</ghg:Name>
      <ghg:Description>CEMS monitoring location 004</ghg:Description>
      <ghg:Type>Single process/process unit exhausts to dedicated stack</ghg:Type>
    </ghg:CEMSMonitoringLocation>
    <ghg:CO2EmissionsAllBiomassFuelsCombined massUOM="Metric Tons">
      <ghg:CalculatedValue>10065.1</ghg:CalculatedValue>
    </ghg:CO2EmissionsAllBiomassFuelsCombined>
    <ghg:CO2EmissionsNonBiogenic massUOM="Metric Tons">
      <ghg:CalculatedValue>10610.2</ghg:CalculatedValue>
    </ghg:CO2EmissionsNonBiogenic>
    <ghg:AnnualCO2EmissionsMeasuredByCEMS massUOM="Metric Tons">
      <ghg:CalculatedValue>20675.3</ghg:CalculatedValue>
    </ghg:AnnualCO2EmissionsMeasuredByCEMS>
    <ghg>TotalCH4CombustionEmissions massUOM="Metric Tons">
      <ghg:CalculatedValue>111.34</ghg:CalculatedValue>
    </ghg>TotalCH4CombustionEmissions>
    <ghg>TotalN2OCombustionEmissions massUOM="Metric Tons">
      <ghg:CalculatedValue>11.435</ghg:CalculatedValue>
    </ghg>TotalN2OCombustionEmissions>
    <ghg:Tier4QuarterDetails>
      <ghg:QuarterName>First Quarter</ghg:QuarterName>
      <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
        <ghg:CalculatedValue>10000.7</ghg:CalculatedValue>
      </ghg:CumulativeCO2MassEmissions>
    </ghg:Tier4QuarterDetails>
    <ghg:Tier4QuarterDetails>
      <ghg:QuarterName>Second Quarter</ghg:QuarterName>
      <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
        <ghg:CalculatedValue>20000.5</ghg:CalculatedValue>
      </ghg:CumulativeCO2MassEmissions>
    </ghg:Tier4QuarterDetails>
    <ghg:Tier4QuarterDetails>
      <ghg:QuarterName>Third Quarter</ghg:QuarterName>
      <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
        <ghg:CalculatedValue>30000.3</ghg:CalculatedValue>
      </ghg:CumulativeCO2MassEmissions>
    </ghg:Tier4QuarterDetails>
    <ghg:Tier4QuarterDetails>
      <ghg:QuarterName>Fourth Quarter</ghg:QuarterName>
      <ghg:CumulativeCO2MassEmissions massUOM="Metric Tons">
        <ghg:CalculatedValue>40000.2</ghg:CalculatedValue>
      </ghg:CumulativeCO2MassEmissions>
    </ghg:Tier4QuarterDetails>
    <ghg>TotalSourceOperatingHours>10</ghg>TotalSourceOperatingHours>
  </ghg:OperatingHoursDetails>

```

```

        <ghg: OperatingHoursCO2ConcentrationSubstituted>11</ghg: OperatingHoursCO2ConcentrationSubstituted>
        <ghg: OperatingHoursStackGasFlowRateSubstituted>12</ghg: OperatingHoursStackGasFlowRateSubstituted>
        <ghg: OperatingHoursStackGasMoistureContentSubstituted>13</ghg: OperatingHoursStackGasMoistureContentSubstituted>
    </ghg: OperatingHoursDetails>
    <ghg: TierMethodologyStartDate>2011-01-01</ghg: TierMethodologyStartDate>
    <ghg: TierMethodologyEndDate>2011-12-31</ghg: TierMethodologyEndDate>
    <ghg: SlipStreamIndicator>Y</ghg: SlipStreamIndicator>
    <ghg: CEMSFuel>coal, coke, natural gas</ghg: CEMSFuel>
    <ghg: ProcessUnitNames>
        <ghg: UnitName>003- CEMS</ghg: UnitName>
    </ghg: ProcessUnitNames>
</ghg: Tier4CEMSDetails>
<ghg: NoCemsCementDetails>
    <ghg: UnitIdentification>
        <ghg: UnitName>001- Non-CEMS RM</ghg: UnitName>
        <ghg: UnitDescription>Non-CEMS, based on consumption of raw material</ghg: UnitDescription>
        <ghg: UnitType>Cement Kiln</ghg: UnitType>
    </ghg: UnitIdentification>
    <ghg: KilnSpecificClinkerFactorsUsed>Y</ghg: KilnSpecificClinkerFactorsUsed>
    <ghg: MonthlyCementDetails>
        <ghg: MonthName>January</ghg: MonthName>
        <ghg: ClinkerProduction>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: ClinkerProduction>
        <ghg: ClinkerProductionMethod>Direct measurement</ghg: ClinkerProductionMethod>
        <ghg: FractionTotalCalciumOxideContentinClinker>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: FractionTotalCalciumOxideContentinClinker>
        <ghg: FractionNonCalcinedCalciumOxideContentinClinker>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: FractionNonCalcinedCalciumOxideContentinClinker>
        <ghg: FractionTotalMagnesiumOxideContentinClinker>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: FractionTotalMagnesiumOxideContentinClinker>
        <ghg: FractionNonCalcinedMagnesiumOxideContentinClinker>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: FractionNonCalcinedMagnesiumOxideContentinClinker>
        <ghg: DeterminationMethodforNonCalcinedCalciumOxide>Method C</ghg: DeterminationMethodforNonCalcinedCalciumOxide>
        <ghg: DeterminationMethodforNonCalcinedMagnesiumOxide>Method D</ghg: DeterminationMethodforNonCalcinedMagnesiumOxide>
    </ghg: MonthlyCementDetails>
    <ghg: MonthlyCementDetails>
        <ghg: MonthName>February</ghg: MonthName>
        <ghg: ClinkerProduction>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: ClinkerProduction>
        <ghg: ClinkerProductionMethod>Direct measurement</ghg: ClinkerProductionMethod>
        <ghg: FractionTotalCalciumOxideContentinClinker>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: FractionTotalCalciumOxideContentinClinker>
        <ghg: FractionNonCalcinedCalciumOxideContentinClinker>
            <ghg: IsSubstitutedIndicator>Y</ghg: IsSubstitutedIndicator>
        </ghg: FractionNonCalcinedCalciumOxideContentinClinker>
        <ghg: FractionTotalMagnesiumOxideContentinClinker>
    
```

```

        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
    </ghg:FractionTotalMagnesiumOxideContentinClinker>
    <ghg:FractionNonCalcinedMagnesiumOxideContentinClinker>
        <ghg:IsSubstitutedIndicator>Y</ghg:IsSubstitutedIndicator>
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