XML Reporting Instructions for Subpart MM – Suppliers of Petroleum Products

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Climate Change Division
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These instructions explain how to report the required data. Reporters should refer to the applicable regulations for information about what data are required to be reported.

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I. Introduction

This document provides a step-by-step description of how to report greenhouse gas data to the EPA electronic greenhouse gas reporting tool (e-GGRT) using the Greenhouse Gas (GHG) XML schema. The GHG XML schema contains all of the data elements needed to comply with the Greenhouse Gas Reporting Program (GHGRP). The schema defines expected data elements and attributes, allowable data formats for each data element, and the hierarchical structure and sequence in which data elements are placed within the XML file.

The GHG XML schema's root data element is "GHG". The data elements within the schema are related to each other in parent-child relationships. The root data element is the parent of the entire schema.

The e-GGRT XML upload method may be used for reporting a facility or supplier's annual GHG data. However, the following actions must be performed using only 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

Every XML file submitted to e-GGRT must be well-formed and conform to the current version of the GHG schema. Every XML file must contain GHG data only for a single facility or supplier. Reporters are required to submit a single XML file containing all greenhouse gas data for a facility or supplier as a complete report. The XML file must include all of the relevant Subparts. Reporters cannot submit a portion of a facility's data to add, delete, correct or update. To make any modification to previously submitted data, a reporter must resubmit the entire set of data. Each subsequent submission for the same facility replaces all of the previously submitted data.

The 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 reporting schema is available for download at the e-GGRT help website:
http://www.ccdsupport.com/confluence/display/help/XML+Reporting+Instructions.
The page includes:

- **Schema zip file with the master GHG_Final_v*N.n*.xsd and supporting subpart and component xsd files for the current reporting year**
- **Schema change log files and year to year comparison reports.**

Table 1
Reporting Numbers

Number Format	Description
Rounding	• CO_2e and CO_2 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. • 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 is reported as a percentage, then the number should be within the range of 0 to 100 (percent). For example, 85.5% is 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

- **MRR:** Mandatory Reporting of Greenhouse Gas Rule.
- **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.

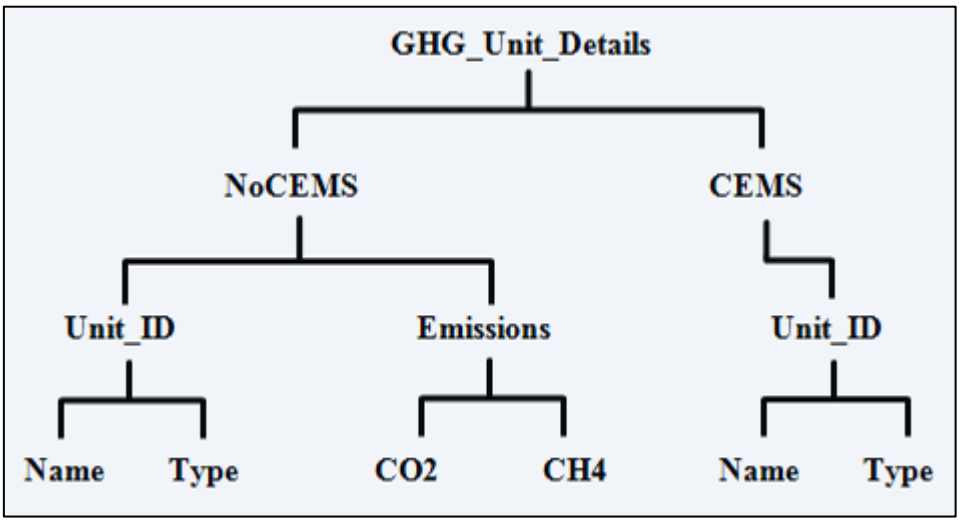
  If a data element does not contain a value, then a single empty tag name may be used. An empty tag has a slash placed after the element's name <FacilitySiteIdentifier/>. **Note:** If you do not

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, <TotalCH4CombustionEmissions massUOM="Metric Tons">.
- **Root/Parent/Child Element:** The schema's structure is like 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, such as in a parent-to-child relationship. 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 seven tips on preparing your XML file:

- **Do not include non-applicable data elements in your 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 the instructions (definition tables) do not reference a particular data element, then **do not** report or include it in your facility's XML file.

- **Sequence data elements in the order specified by the schema.** The figures and tables in this document depict the proper sequence in which data elements are arranged in the XML file 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. Report values for enumerations exactly as they are defined within the schema, including punctuation marks. 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.

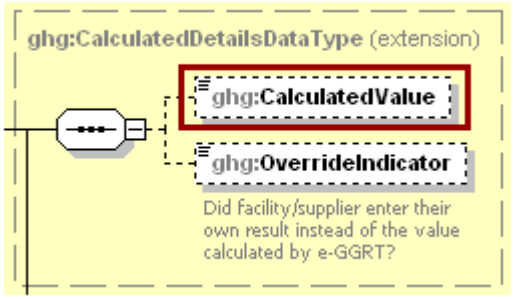
- **The schema diagrams do not depict commonly used data types.** The schema diagrams display almost every data element in the schema except the data elements that are associated with the three most commonly occurring data types:

    - Calculated Details
    - Measurement Details
    - Unit Identification Details

  Once defined, these commonly used data types (static collection of data elements) are 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 reduce their redundancy. They are however, referenced in the definition tables in the description of their parent data element.

- **Conditionally required data elements.** Conditionally required data elements 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 include it in your 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. **Do not** include a parent element that is not required, nor include any of its child data elements in your facility's XML file.

Figure 2
Calculated Details Data Type Schema Diagram

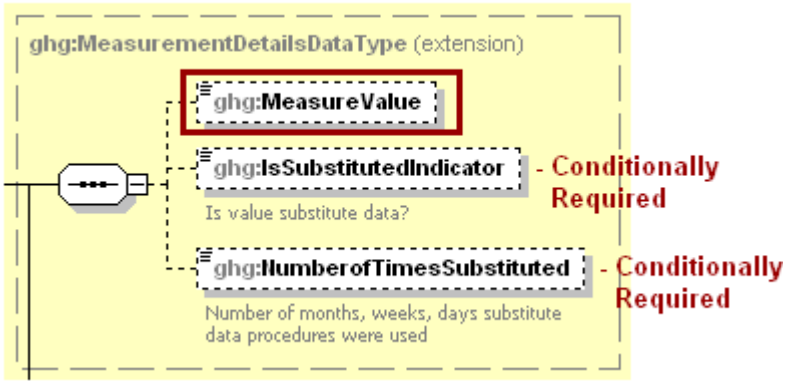


Note: Data elements boxed in red are required.

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



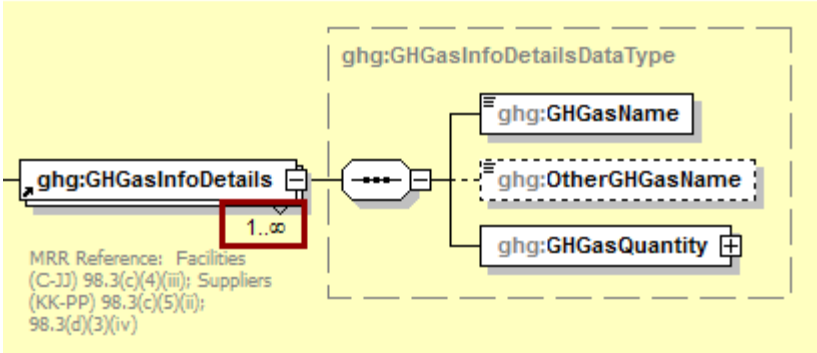
Note: Data elements boxed in red are required. Please see page 4 of this document for more information on conditionally required elements.

Table 3
Measurement Details Data Element Definitions

Data Element Name	Description
MeasurementDetailsDataType	
MeasureValue	Measured value (decimal).
IsSubstitutedIndicator	An indication (Y/N) that the measured 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.

The XML symbol "1..∞" shown in Figure 4 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 4
"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>
```

II. Summary of Changes

Substantive changes to the Subpart MM XML schema and reporting guidelines for Reporting Year 2017 include:

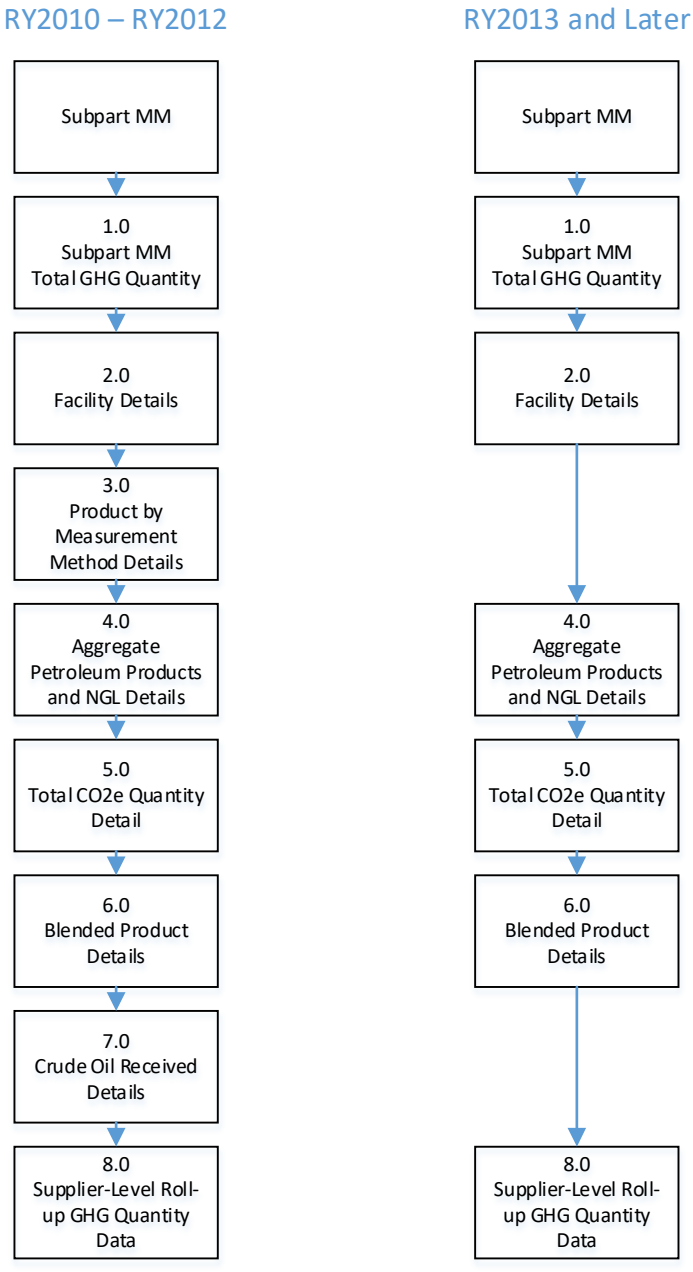
- New data elements in the GHGasInfoDetails node (GHGasCASRegistryNumber, GHGasLinearChemicalFormula, OtherGHGasCASRegistryNumber, and OtherGHGaslinearChemicalFormula) now appear in the schema but are only applicable to gases other than Carbon Dioxide, Methane, Nitrous Oxide, and Biogenic Carbon Dioxide **so they should NOT be used in the reporting of Subpart MM** (see Section 1, Subpart MM Total Emissions).

Please note that example screen images and XML examples sourced from or labeled with a prior reporting year are accurate for Reporting Year 2017.

III. Subpart MM Overview

This document provides a step-by-step description of how to report data for Subpart MM Suppliers of Petroleum Products using the XML schema.

Figure 5
Subpart MM Reporting Diagram RY2010 – RY2012 vs RY2013 and Later



The XML schema includes the following areas for reporting for Subpart MM, as displayed in the reporting diagram:

1.0 Subpart MM Total GHG Quantity: includes the total quantity of carbon dioxide.

2.0 Facility Data Details: Refinery or Importer/Exporter

3.0 Products by Measurement Method Details (omit for RY2013 and later)

4.0 Aggregate Petroleum Products and Natural Gas Liquids Details

5.0 Total CO_2 Quantity Details

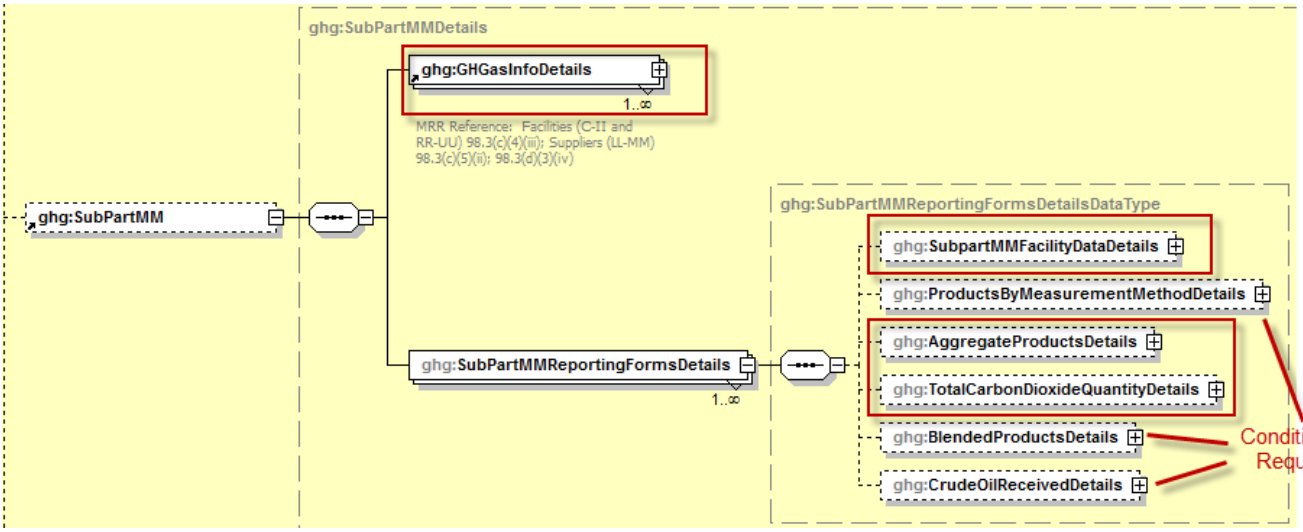
6.0 Blended Products Details

7.0 Crude Oil Received Details (omit for RY2013 and later)

8.0 Supplier Level Roll-up GHG Quantity: includes information on how to add GHG quantity data to supplier level totals.

NOTE: If your facility is subject to reporting under Subpart MM (Suppliers of Petroleum Products), EPA recommends that you also consider the following source categories in your facility applicability determination: Subpart C (General Stationary Fuel Combustion), Subpart P (Hydrogen Production), Subpart X (Petrochemical Production), Subpart Y (Petroleum Refineries), Subpart W (Petroleum and Natural Gas Systems), Subpart LL (Suppliers of Coal-based Liquids), Subpart NN (Suppliers of Natural Gas and Natural Gas Liquids), Subpart PP (Suppliers of Carbon Dioxide), Subpart TT (Industrial Waste Landfills) and Subpart UU (Injection of Carbon Dioxide). These source categories are only provided as suggestions - additional Subparts may be relevant for a given facility/supplier and not all listed Subparts are relevant for all facilities or suppliers.

Figure 6
Subpart MM Schema Diagram

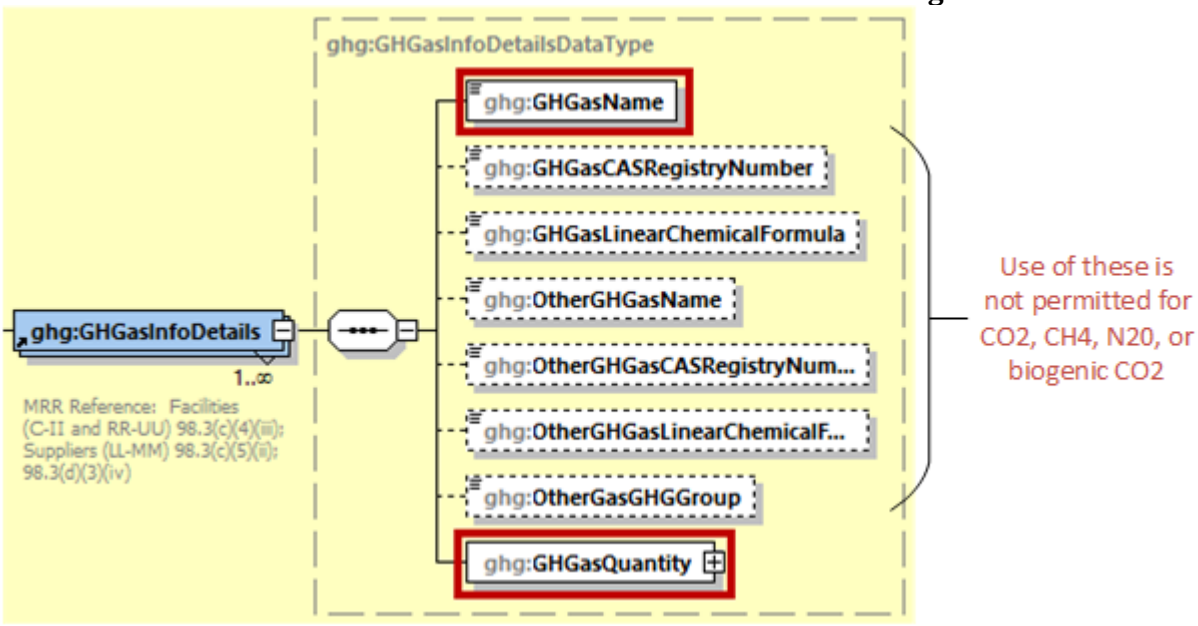


Note: Data elements boxed in red are required. Please see page 4 of this document for more information on conditionally required elements.

1.0 Subpart MM Total GHG Quantity

Greenhouse gas information details comprise a collection of data elements to report the total annual GHG quantity of each greenhouse gas (GHG) listed in Table A-1 of 40 CFR 98 Mandatory Reporting of Greenhouse Gases reported under Subpart MM, expressed in metric tons.

Figure 7
Greenhouse Gas Information Details Schema Diagram



Note: Data elements boxed in red are required.

Suppliers must calculate the annual CO_2 emissions (metric tons) that would result from the complete combustion or oxidation of all petroleum products and natural gas liquids (NGLs) that leave the facility, minus emissions that would result from the complete combustion or oxidation of: 1) petroleum products and NGLs that enter the refinery to be further refined or otherwise used on site, and 2) any biomass co-processed with petroleum feedstock. For Subpart MM, report the gas name and emissions for biogenic carbon dioxide (CO2); do NOT report the CAS Registry Number, Linear Chemical Formula, or the other gas data elements for CO2. For greenhouse gas quantity, report the total quantity for CO_2 using the following guidelines:

1. If the supplier is a refinery, use the potential CO_2 quantity that would result from the complete combustion or oxidation of all petroleum products and natural gas liquids (e.g., refinery gate) minus non-crude feedstocks and any biomass to be co-processed with petroleum feedstocks (Equation MM-4).

2. If the supplier is an importer or exporter, use the potential CO2 quantity that would result from the complete combustion of all petroleum products and NGLs imported or exported respectively (Equations MM-1 and MM-5).

For the GHG quantity, report the calculated value and mass unit of measure (Metric Tons) only.

Note: You must follow the rounding rules found in Table 1

Table 4
Greenhouse Gas Information Details Data Element Definitions

Data Element Name	Description
GHGasInfoDetails	**Parent Element:** A collection of data elements containing the total annual greenhouse gas quantity of each greenhouse gas (GHG) listed in Table A-1 of 40 CFR 98 Mandatory Reporting of Greenhouse Gases reported under this Subpart, expressed in metric tons.
GHGasName	Specify the name of the GHG: Carbon Dioxide
GHGasQuantity	A collection of data elements that quantify the annual greenhouse gas quantity from this supplier category. Report the value in the child data element **CalculatedValue** using the guidelines above. Set the units of measure to "Metric Tons" in the attribute **massUOM**.

XML Excerpt 2
Example for Greenhouse Gas Information Details

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

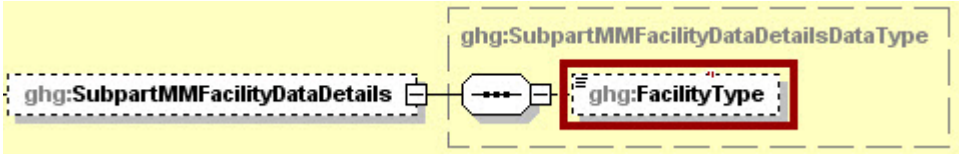
Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas quantity data.

2.0 Facility Details

This section contains the facility type information that must be reported under Subpart MM for a refinery, importer, or exporter:

- Type of facility is required. Report "Refinery" or "Importer/Exporter" in the **FacilityType** data element.

Figure 8
Facility Type Schema Diagram



Note: Data elements boxed in red are required.

XML Excerpt 3
Example for Subpart MM Facility Data Details

```
<ghg:SubpartMM>
        <ghg:SubpartMMFacilityDataDetails>
                <ghg:FacilityType>Refinery</ghg:FacilityType>
        </ghg:SubpartMMFacilityDataDetails>
```

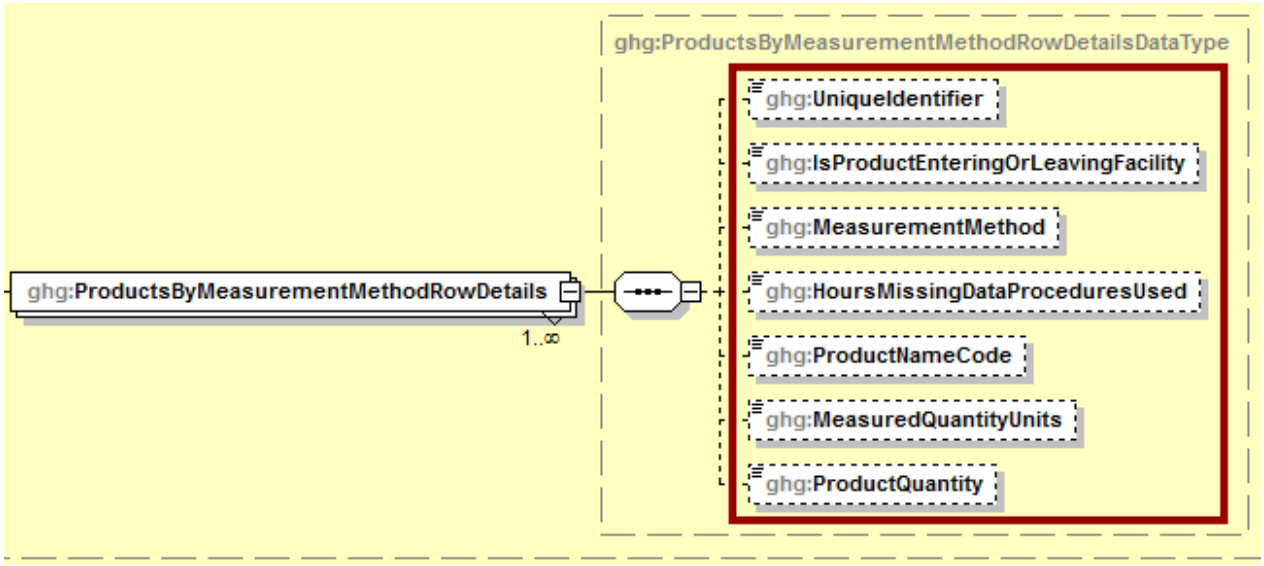
Note: The code excerpt above is presented here to demonstrate the concept of reporting facility data details.

3.0 Products by Measurement Method Details

This section is applicable to a refinery, importer, or exporter, and describes the schema elements for reporting the annual product quantity in metric tons or barrels by each quantity measurement standard method or other industry standard practice used. This node is applicable to RY2010, RY2011, and RY2112, and is omitted for RY2013 and later reporting. If this node is used the required information for each product includes:

- Unique identifier for the specified product, numbered sequentially ("1", "2", "3", etc.).
- Whether the product is entering the facility or leaving the facility, or if the product is being imported or exported [98.396(b) and (c)]
- The standard method or industry standard practice used to measure the product quantity [98.396(a)(4), (8), (13), and (15); 98.396(b)(1) and (4); 98.396(c)(1) and (4)]
- The amount of time that missing data procedures were used (hours) [98.3(c)(8)]
- The corresponding product name code listed in Table MM-1 and Table MM-2 [98.396(a)(1) and (5); 98.396(b)(1); 98.396(c)(1)]
- The quantity of the product, and unit of measure. This quantity must include the quantities of the individual components of blended products reported in "**Blended Products Details**" that have the same measurement method and product. [98.396(a)(1), (5), and (13); 98.396(b)(1); 98.396(c)(1)]

Figure 9
Products Measurement Method Details Schema Diagram



Note: Data elements boxed in red are required for all RY2010 – RY2012 submissions.

Table 5
Products by Measurement Method Data Element Definitions

Data Element Name	Description
ProductsByMeasurementMethodDetails	**Parent Element:** A collection of data elements containing information on measurement methods and product quantities.
ProductsByMeasurementMethodTableDetails	**Parent Element:** A collection of data elements containing information on measurement methods and product quantities.
ProductsByMeasurementMethodTableRowDetails	**Parent Element:** A collection of data elements containing information on measurement methods and product quantities for one product.
UniqueIdentifier	A unique identifier for the specified product, numbered sequentially (“1”, “2”, “3”, etc.).
IsProductEnteringOrLeavingFacility	An indication of whether the product is an input or output, import or export. For refineries, specify "In" if the product is entering the refinery or "Out" if the product is leaving the refinery. For importer/exporter facilities, specify "Import" if the product is being imported or "Export" if the product is being exported.
MeasurementMethod	The standard method or industry standard practice used for the product quantity. (See the detailed instructions below this table for further information[1].)
HoursMissingDataProceduresUsed	The number of hours in which missing data procedures of 98.395 were used to estimate the product quantity.
ProductNameCode	The Product Name Code corresponding to products listed on Table MM-1 and Table MM-2. Also see appendix A.
MeasuredQuantityUnits	The unit of measure for the product: Specify either barrels “BBL” or metric tons “MT”.
ProductQuantity	The quantity of the product. This quantity should include the quantities of the individual component of blended products reported for products where quantity was determined under procedures for estimating missing data at 40 CFR 98.395, enter “MISSING-PRODUCT QUANTITY”.

[1]**MeasurementMethod**: Indicate the standard method or industry standard practice used for your quantity measurements. You must be specific in your description so that EPA can adequately identify the standard

method or industry standard practice. 40 CFR 98.394(a) specifies that for quantity measurements, you must use an appropriate standard method published by a consensus-based standards organization. Your description should include the name of the consensus-based standard organization. Such organizations include but are not limited to ASTM, ANSI, AGA, API, ASME and NAESB. Also include identification information such as the title of the specific method used (e.g. API Manual of Petroleum Measurement Standards Chapter 5.2; ASTM D1250-80(2002); ASME MFC-18M-2001; ASME MFC-22-2007).

If no appropriate standard method exists, then you may use an industry standard practice. An industry standard practice is an approach to determine quantity that achieves a precision which most members of your industry would consider reasonable for the particular product, conditions, and circumstances. You may only use an appropriate industry standard practice to determine quantity if no standard method published by a consensus-based organization exists or would be appropriate to measure the particular product under the particular conditions and circumstances.

A delivery record itself is a record and not a quantity determination method or standard practice. The appropriate method or practice followed to determine the quantity cited in a delivery record must be reported. Third party verification is also not a quantity determination method or standard practice. The appropriate method or practice followed by the third party to determine quantity must be reported (e.g. bills of lading, invoices and custody transfers are not acceptable quantity determination methods or standard practices).

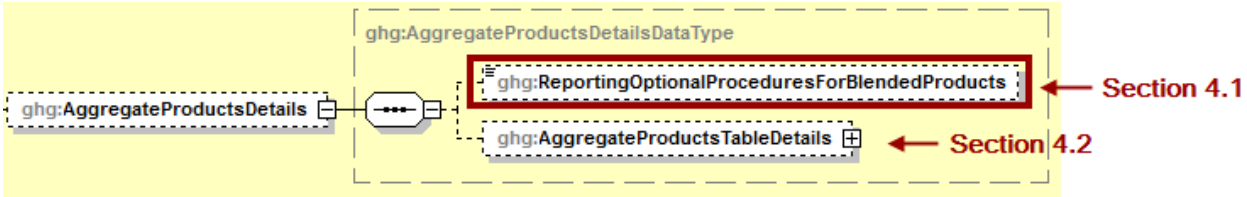
XML Excerpt 4
Example for Products Measurement Method Details

```
<ghg:ProductsByMeasurementMethodDetails>
        <ghg:ProductsByMeasurementMethodTableDetails>
                <ghg:ProductsByMeasurementMethodRowDetails>
                        <ghg:UniqueIdentifier>1</ghg:UniqueIdentifier>
                        <ghg:IsProductEnteringOrLeavingFacility>Out</ghg:IsProductEnteringOrLeavingFacility>
                        <ghg:MeasureMethod>ASTM D1250-80(2002)</ghg:MeasureMethod>
                        <ghg:HoursMissingDataProceduresUsed>0</ghg:HoursMissingDataProceduresUsed>
                        <ghg:ProductNameCode>DFO2LS</ghg:ProductNameCode>
                        <ghg:MeasureQuantityUnits>BBL/ghg:MeasureQuantityUnits>
                        <ghg:ProductQuantity>46500000</ghg:ProductQuantity>
                </ghg:ProductsByMeasurementMethodRowDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting products measurement method data.

4.0 Aggregate Petroleum Products and Natural Gas Liquids Details

This section provides a step-by-step description of how to report the annual quantity of each product that enters or leaves the facility, or is imported or exported. This information is applicable to refineries, importers, and exporters.



4.1 Optional Procedures for Blended Products

You must indicate (Yes/No) whether the facility is reporting using the optional procedures specified in 98.393(i) for blended products that do not contain biomass.

If you are reporting using the optional procedures specified in 98.393(i) for blended products, please review the instructions in section 6.1 of this document. Some data elements are to be double counted between the information described in section 4 and the data elements described in section 6, while others are not double counted. Additional details about the optional procedures for blended products are provided in section 6 below.

4.2 Aggregate Products Table Details

This subsection provides instruction for reporting the annual quantity of each product that enters the refinery to be further refined or otherwise used on site, the quantity of each product supplied by a refinery, or annual quantities of each product imported or exported. **Note:** For natural gas liquids, the quantity shall reflect the individual components of the product.

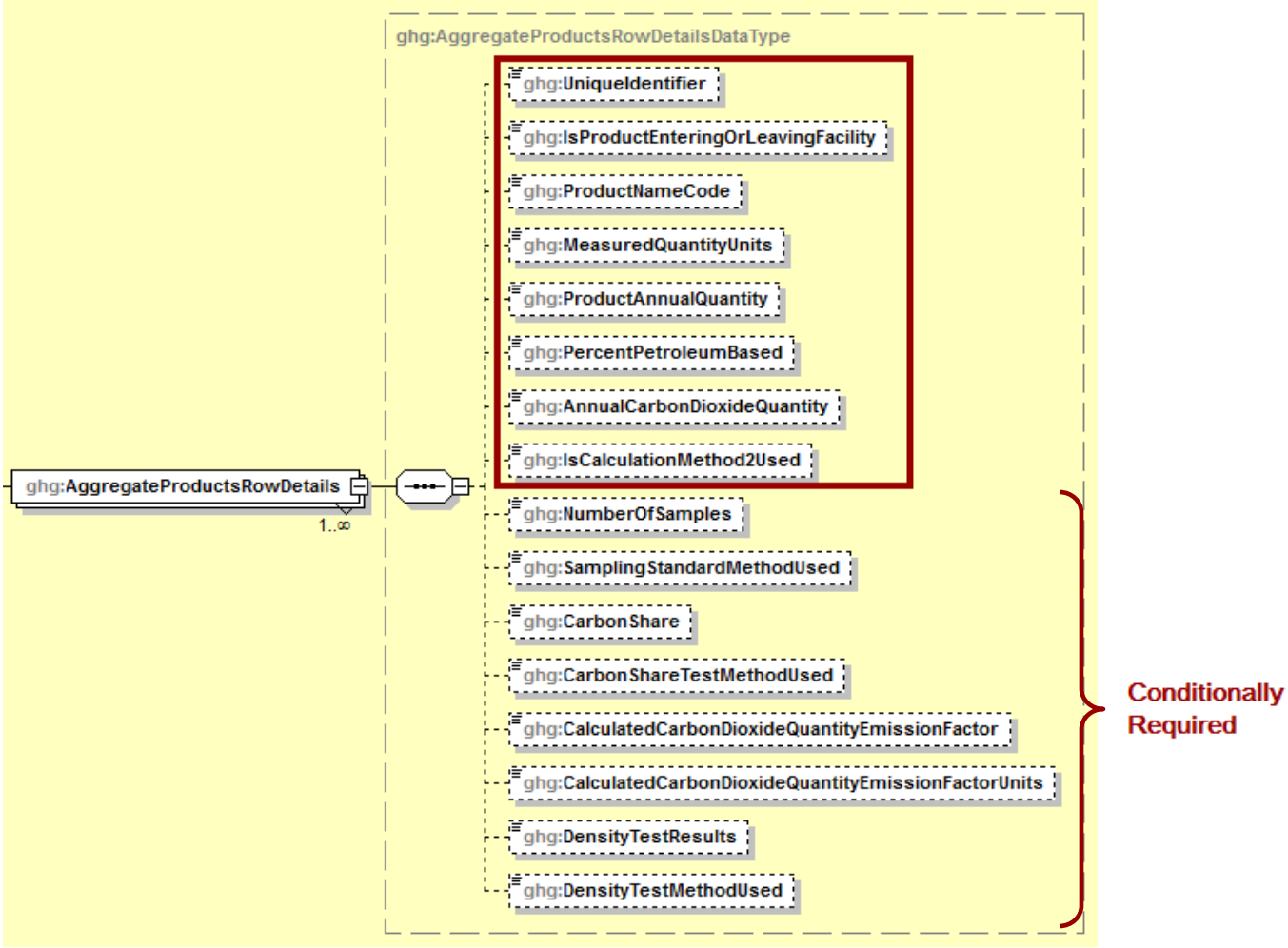
For the facility within Aggregate Products Details node include an indication (Yes/No) of whether the facility is reporting optional procedures specified in 98.393(i) for blended products that do not contain biomass.

For each product entering or leaving the facility, report the following information:

- An indication of whether the product is entering or leaving the refinery or being imported or exported. [98.396(b) and (c)].
- The product name code listed in Table MM-1 and Table MM-2 [98.396(a)(1) and (5); 98.396(b)(1); 98.396(c)(1)]
- The annual quantity of the product in barrels (BBL) or metric tons (MT) [98.396(a)(2), (6), and (14); 98.396(b)(2); 98.396(c)(2)]

- The percent of the product that is petroleum based [98.396(a)(3) and (7); 98.396(b)(3); 98.396(c)(3)]
- The annual CO_2 emissions that would result from complete combustion or oxidation of the product in metric tons [98.396(a)(16), (17), and (18); 98.396(b)(7); 98.396(c)(7)]
- Indication of the use of Calculation Method 2 to determine the emission factor for the product
- **Conditionally required**: If Calculation Method 2 is used, the number of samples collected according to 98.394(c) [98.396(a)(9)(i) and (11)(i); 98.396(b)(5)(i); 98.396(c)(5)(i)]
- **Conditionally required**: If Calculation Method 2 is used, the standard sampling method used for sample collection [98.396(a)(9)(ii) and (11)(ii); 98.396(b)(5)(ii); 98.396(c)(5)(ii)]
- **Conditionally required**: If Calculation Method 2 is used, the carbon share test results (mass percent) [98.396(a)(9)(iii) and (11)(iii); 98.396(b)(5)(iii); 98.396(c)(5)(iii)]
- **Conditionally required**: If Calculation Method 2 is used, and standard method used to test carbon share [98.396(a)(9)(iv) and (11)(iv); 98.396(b)(5)(iv); 98.396(c)(5)(iv)]
- **Conditionally required**: If Calculation Method 2 is used, the calculated emission factor, metric tons CO_2 per barrel, or metric tons CO_2 per metric ton of product [98.396(a)(9)(v) and (11)(v); 98.396(b)(5)(v); 98.396(c)(5)(v)]
- **Conditionally required**: If Calculation Method 2 is used, the density in metric tons per barrel [98.396(a)(10)(i) and (12)(i); 98.396(b)(6)(i); 98.396(c)(6)(i)]
- **Conditionally required**: If Calculation Method 2 is used, the standard method used to test density [98.396(a)(10)(ii) and (12)(ii); 98.396(b)(6)(ii); 98.396(c)(6)(ii)]

Figure 10
Aggregate Petroleum Products and Natural Gas Liquids Diagram



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

Table 6
Aggregate Petroleum Products and NGLs Data Element Definitions

Data Element Name	Description
ReportingOptionalProceduresForBlendedProducts	An indication (Yes/No) of whether the facility is reporting using the optional procedures specified in 98.393(i) for blended products that do not contain biomass.

Data Element Name	Description
AggregatedProductsTableDetails	**Parent Element:** A collection of data elements containing information on product quantities for aggregate petroleum products and NGLs.
AggregatedProductsRowDetails	**Parent Element:** A collection of data elements containing information on product quantities for aggregate petroleum products and NGLs for one product.
UniqueIdentifier	A unique identifier for the specified product, numbered sequentially (“1”, “2”, “3”, etc.).
IsProductEnteringOrLeavingFacility	An indication of whether the product is an input or output, import or export. For refineries, specify "In" if the product is entering the refinery or "Out" if the product is leaving the refinery. For importer/exporter facilities, specify "Import" if the product is being imported or "Export" if the product is being exported. See list of allowable values. In Out Import Export
ProductNameCode	The Product Name Code corresponding to products listed on Table MM-1 and Table MM-2. Codes are available in the attached **Tables MM-1 and MM-2.**
MeasuredQuantityUnits	The unit of measure for the product. See list of allowable values. BBL MT
ProductAnnualQuantity	The quantity of the product in the units specified. This quantity should include any quantities reported in "**BlendedProductsDetails**" that have the same “**ProductNameCode**”.
PercentPetroleumBased	The percent of the product that is petroleum based. For example, enter “0” for biomass feedstock and enter “100” for products that were not produced by blending a petroleum-based product with a biomass feedstock.
AnnualCarbonDioxideQuantity	The annual CO_2 emissions in metric tons (MT) that would result from complete combustion or oxidation of the product. Do not include CO_2 emissions resulting from individual components reported in "**BlendedProductsDetails**".

Data Element Name	Description
IsCalculationMethod2Used	An indication (Yes/No) of whether Calculation Method 2 was used to determine the emission factor for this product.
NumberOfSamples	**Conditionally Required**: If Calculation Method 2 is used, then report the number of samples collected as specified in 98.394(c).
SamplingStandardMethodUsed	**Conditionally Required**: If Calculation Method 2 is used, then report the standard method used to collect the samples according to 98.394(c).
CarbonShare	**Conditionally Required**: If Calculation Method 2 is used, then report the carbon share test results reported as mass percent.
CarbonShareTestMethodUsed	**Conditionally Required**: If Calculation Method 2 is used, then report the standard method used to test carbon share according to 98.394(c).
CalculatedCarbonDioxideQuantityEmissionFactorUnits	**Conditionally Required**: If Calculation Method 2 is used, then report the calculated CO_2 emission factor. See list of allowable values. MT CO2/BBL MT CO2/MT
DensityTestResults	**Conditionally Required**: If Calculation Method 2 is used, then report the density test results in units of metric tons per barrel
DensityTestMethodUsed	**Conditionally Required**: If Calculation Method 2 is used, standard method used to test density according to 98.394(c).

XML Excerpt 5
Example for Aggregate Petroleum Products and NGLs

```
<AggregateProductsDetails>
    <ReportingOptionalProceduresForBlendedProducts>Yes</ReportingOptionalProceduresForBlendedProducts>
        <AggregateProductsTableDetails>
            <AggregateProductsRowDetails>
                <UniqueIdentifier>1</UniqueIdentifier>
                <IsProductEnteringOrLeavingFacility>Out</IsProductEnteringOrLeavingFacility>
                <ProductNameCode>DFO1UL</ProductNameCode>
                <MeasuredQuantityUnits>BBL</MeasuredQuantityUnits>
                <ProductAnnualQuantity>400000</ProductAnnualQuantity>
                <PercentPetroleumBased>100</PercentPetroleumBased>
                <AnnualCarbonDioxideQuantity>171840</AnnualCarbonDioxideQuantity>
                <IsCalculationMethod2Used>No</IsCalculationMethod2Used>
            </AggregateProductsRowDetails>
            <AggregateProductsRowDetails>
                <UniqueIdentifier>2</UniqueIdentifier>
                <IsProductEnteringOrLeavingFacility>Out</IsProductEnteringOrLeavingFacility>
                <ProductNameCode>PTROCOKE</ProductNameCode>
                <MeasuredQuantityUnits>MT</MeasuredQuantityUnits>
                <ProductAnnualQuantity>100000</ProductAnnualQuantity>
                <PercentPetroleumBased>100</PercentPetroleumBased>
                <AnnualCarbonDioxideQuantity>3384000</AnnualCarbonDioxideQuantity>
                <IsCalculationMethod2Used>Yes</IsCalculationMethod2Used>
                <NumberOfSamples>12</NumberOfSamples>
                <SamplingStandardMethodUsed>ASTM D6970 - 03(2008)</SamplingStandardMethodUsed>
                <CarbonShare>90.0</CarbonShare>
                <CarbonShareTestMethodUsed>ASTM D3176-89 (Reapproved 2002)</CarbonShareTestMethodUsed>
                <CalculatedCarbonDioxideQuantityEmissionFactor>3.384</CalculatedCarbonDioxideQuantityEmissionFactor>
                <CalculatedCarbonDioxideQuantityEmissionFactorUnits>MTCO2/MT
                </CalculatedCarbonDioxideQuantityEmissionFactorUnits>
                <DensityTestResults>0.18</DensityTestResults>
                <DensityTestMethodUsed>ASTM D2638 - 10</DensityTestMethodUsed>
            </AggregateProductsRowDetails>
        </AggregateProductsTableDetails>
</AggregateProductsDetails>
```

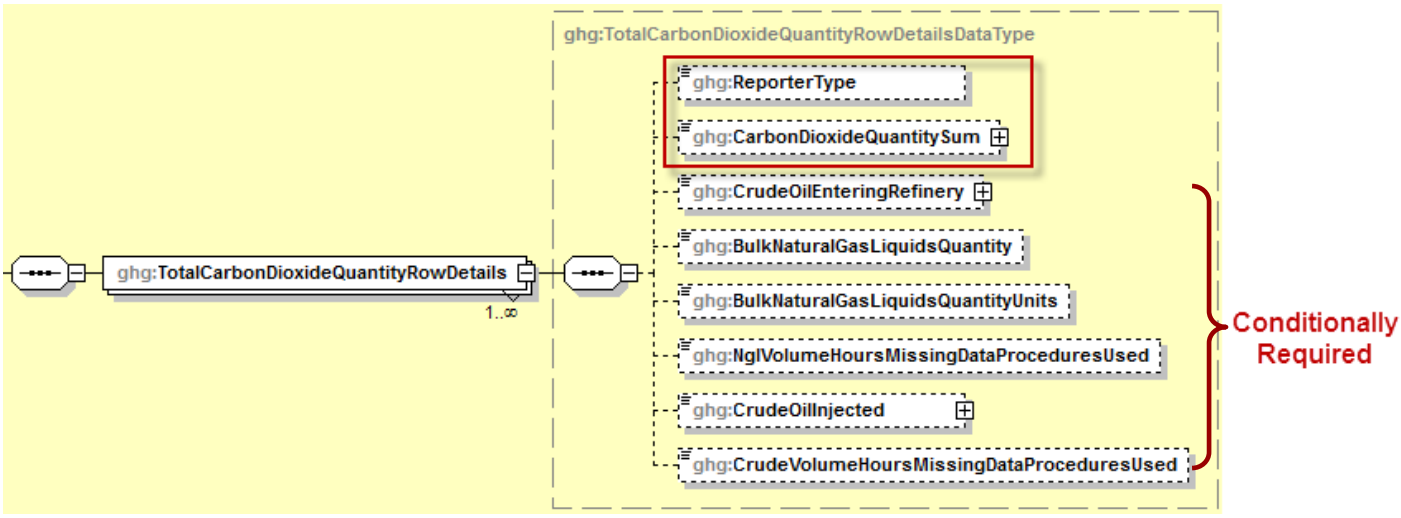
Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas quantity data.

5.0 Total CO_2 Quantity Details

This section provides a step-by-step description of how to report the annual quantity of CO_2 and other information for each specified product. This information is applicable to refineries, importers, and exporters.

- The type of reporter in which the following data applies:
  - Refinery
  - Importer
  - Exporter
- Annual CO_2 emissions (in metric tons) that would result from the complete combustion or oxidation of all products as calculated using 98.393(d) for refineries or 98.393(e) for importers or exporters. This value excludes CO_2 from biomass based products. [98.396(a)(19), 98.396(b)(8), 98.396(c)(8)]. **Note:** The total GHG quantity for imports and the total GHG quantity for exports must be reported separately. If a reporting entity is an importer and an exporter, then a separate instance of the parent data element "TotalCarbonDioxideQuantityRowDetails" must be reported for each reporter type (Importer or Exporter). A single reporting entity cannot be both a refinery and an importer/exporter.
- **Conditionally required**: For refineries only for RY2013 and later, the quantity of crude oil entering the refinery in barrels (BBL). [98.396(a)(20)]
- **Conditionally required**: For refineries only, the bulk NGL product quantity received for processing in barrels (BBL) or metric tons (MT). [98.396(a)(21)]
- **Conditionally required**: For refineries only, the time (in hours) for which missing data procedures were used to estimate the quantity of NGL received for processing [98.3(c)(8)]
- **Conditionally required**: For refineries only, the quantity of crude oil (in barrels per year) injected into a crude oil supply or reservoir. Oil entering the refinery but not reported in 98.396(a)(2) or 98.396(a)(20) is not reported here. [98.396(a)(22)]
- **Conditionally required**: For refineries only, the time (hours) for which missing data procedures were used to estimate the crude quantity. [98.3(c)(8)]

Figure 11
Total CO_2 Quantity Diagram



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

Table 7
Total CO_2 Quantity Data Element Definitions

Data Element Name	Description
TotalCarbonDioxideQuantityDetails	**Parent Element:** A collection of data elements containing information on the total quantity of CO_2 potentially released from the complete combustion or oxidation of all products as calculated using 98.393(d) or 98.393(e).
TotalCarbonDioxideQuantityTableDetails	**Parent Element:** A collection of data elements containing information on the total quantity of CO_2 potentially released from the complete combustion or oxidation of all products as calculated using 98.393(d) or 98.393(e).
TotalCarbonDioxideQuantityRowDetails	**Parent Element:** A collection of data elements containing information on the total quantity of CO_2 potentially released from the complete combustion or oxidation of all products as calculated using 98.393(d) or 98.393(e).
Reporter Type	The type of facility in which the following data is applicable. See list of allowable values. Refinery Importer Exporter

Data Element Name	Description
CarbonDioxideQuantitySum	The annual CO_2 emissions in metric tons (MT) that would result from complete combustion or oxidation of all products as calculated using 98.393(d) or 98.393(e). Include CO_2 from blended products reported in "**BlendedProductsDetails**". Reported value excludes CO_2 from biomass based products. Set the units of measure to "Metric Tons" in the attribute **massUOM**.
CrudeOilEnteringRefinery	**Conditionally required**: For refineries only for RY2013 and later, the annual quantity of crude oil entering the refinery in barrels (BBL).
BulkNaturalGasLiquidsQuantity	**Conditionally Required**: For refineries only, the bulk NGL product quantity received for processing in units specified, barrels (BBL) or metric tons (MT).
BulkNaturalGasLiquidsQuantityUnits	**Conditionally Required**: For refineries only, the unit of measure for bulk NGLs received. For barrels specify "BBL", and for metric tons specific "MT".
NglVolumeHoursMissingDataProceduresUsed	**Conditionally Required**: For refineries only, the time (hours) for which missing data procedures were used to estimate the quantity of NGL received for processing.
CrudeOilInjected	**Conditionally Required**: For refineries only, the quantity of crude oil (in barrels) injected into a crude oil supply or reservoir. Oil entering the refinery, but not reported in 98.396(a)(2) or 98.396(a)(20), is not reported here. Set the units of measure to "barrels" in the attribute **volUOM**
CrudeVolumeHoursMissingDataProceduresUsed	**Conditionally Required**: For refineries only, the time (hours) for which missing data procedures were used to estimate the crude quantity.

XML Excerpt 6
xExample for Total CO2 Quantity – Refineries

```
<TotalCarbonDioxideQuantityDetails>
    <TotalCarbonDioxideQuantityTableDetails>
            <TotalCarbonDioxideQuantityRowDetails>
                <ReporterType>Refinery</ReporterType>
                <CarbonDioxideQuantitySum massUOM="Metric Tons">5413347.5</CarbonDioxideQuantitySum>
                <BulkNaturalGasLiquidsQuantity>50000</BulkNaturalGasLiquidsQuantity>
                <BulkNaturalGasLiquidsQuantityUnits>BBL</BulkNaturalGasLiquidsQuantityUnits>
                <NglVolumeHoursMissingDataProceduresUsed>0.0</NglVolumeHoursMissingDataProceduresUsed>
                <CrudeOilInjected volUOM="barrels">0.0</CrudeOilInjected>
                <CrudeVolumeHoursMissingDataProceduresUsed>0.0</CrudeVolumeHoursMissingDataProceduresUsed>
            </TotalCarbonDioxideQuantityRowDetails>
    </TotalCarbonDioxideQuantityTableDetails
</TotalCarbonDioxideQuantityDetails>
```

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

XML Excerpt 7
Example for Total CO2 Quantity – Importers and Exporters

```
<TotalCarbonDioxideQuantityDetails>
    <TotalCarbonDioxideQuantityTableDetails>
            <TotalCarbonDioxideQuantityRowDetails>
                <ReporterType>Importer</ReporterType>
                <CarbonDioxideQuantitySum massUOM="Metric Tons">541334.5</CarbonDioxideQuantitySum>
            </TotalCarbonDioxideQuantityRowDetails>
            <TotalCarbonDioxideQuantityRowDetails>
                <ReporterType>Exporter</ReporterType>
                <CarbonDioxideQuantitySum massUOM="Metric Tons">513347.5</CarbonDioxideQuantitySum>
            </TotalCarbonDioxideQuantityRowDetails>
    </TotalCarbonDioxideQuantityTableDetails
</TotalCarbonDioxideQuantityDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas quantity data. For refineries include only one TotalCarbonDioxideQuantityRowDetails node and for refineries in RY2013 and later also include CrudeOilEnteringRefinery

6.0 Blended Products Details

Optional. This section provides a step-by-step description of how to report CO_2 quantities for blended products that were calculated according to 98.393(i) – Optional procedures for blended products that do not contain biomass. **Note:** This section only applies to reporters that choose to use the optional procedures for reporting blended products that do not contain biomass.

Figure 12
Blended Product Details Schema Diagram

Special Instructions Related to the reporting of Blended products and overlap with the reporting of Aggregate Products described in section 4 above.

If you choose to use the optional procedures for reporting blended products that do not contain biomass per the requirements of 98.393(i) you must report the following:

- Quantity of each blending component:
  - Report the quantity of each blending component in data element "BlendingComponentQuantity" under parent "BlendedProductComponentsTableDetails".
  - **Note:** Include this value in data element "Product Annual Quantity" under parent element "AggregateProductsTableDetails" for the same product code.

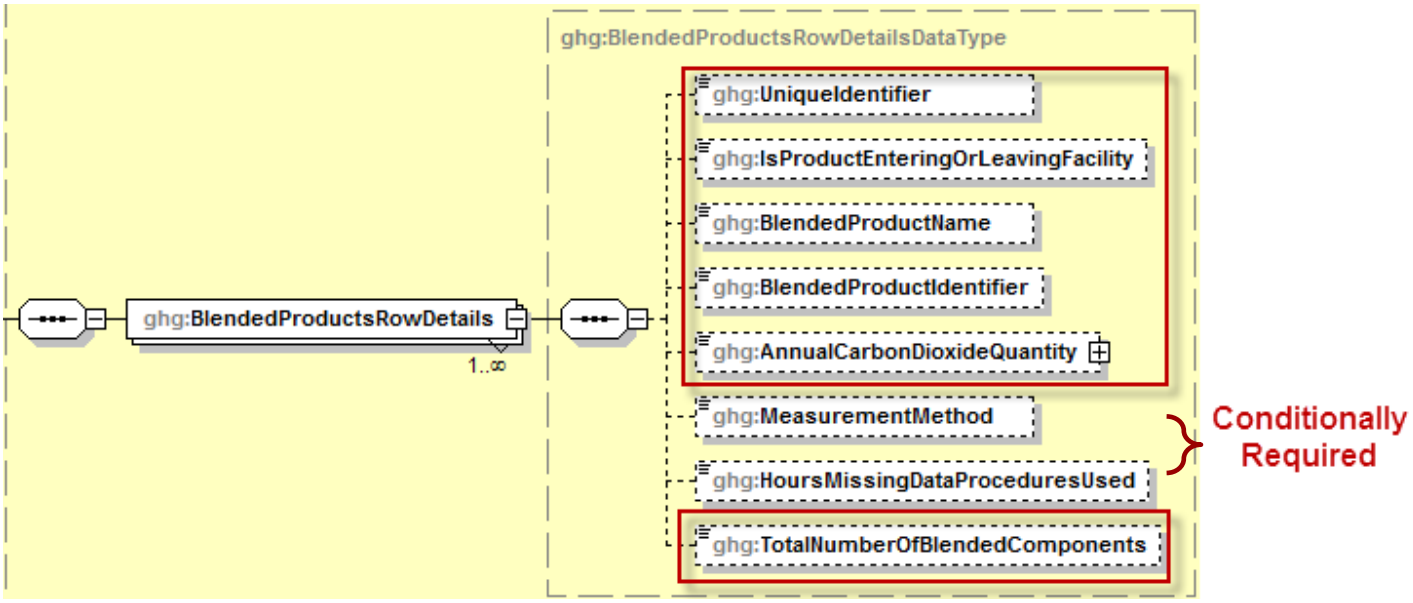
- CO_2 Quantity associated with each blending component:
  - Report the CO_2 quantity that would result from complete combustion or oxidation of the blended product at the PRODUCT level in data element "AnnualCarbonDioxideQuantity" under parent element "BlendedProductsRowDetails". Do not include the CO_2 quantity associated with components of this blended product (which are reported under parent element "BlendedProductComponentsTableDetails) in the value reported for the data element "AnnualCarbonDioxideQuantity" under parent element "AggregateProductsRowDetails", as referenced in section 4 above.
  - DO NOT INCLUDE the CO_2 quantity for the blended product in data element "AnnualCarbonDioxideQuantity" under parent element "AggregateProductsRowDetails".
  - INCLUDE the CO_2 quantity for the blended product in data element "CarbonDioxideQuantitySum" under parent element "TotalCarbonDioxideQuantityRowDetails".

6.1 Blended Products CO_2 Quantity and Measurement Methods

This subsection provides a step-by-step description of how to report the annual CO_2 emissions (in metric tons) that would result from complete combustion or oxidation of each specified blended product. The section also includes instruction for reporting the measurement methods used for determining the quantity of CO_2 for blended products.

Note: See section 6.2 for how to report the individual components for each specified blended product.

Figure 13
Blended Products Row Details Schema Diagram



Note: Please see page 4 of this document for more information on conditionally required elements.

For each blended product in which a CO_2 quantity was calculated using the optional procedures for blended products that do not contain biomass [98.393(i)], report the following information:

- Unique identifier for each blended product, numbered sequentially ("1", "2", "3", etc.).
- An indication of whether the product is entering or leaving the refinery or is being imported or exported. [98.396(d)(1)(iii)]
    - In
    - Out
    - Import
    - Export
- The blended product name [98.396(d)]
- A reporter assigned unique identifier for each blended product. [98.396(d)]

- The annual CO_2 emissions (in metric tons) that would result from complete combustion or oxidation of the blended product. [98.396(d)(1)(ii)]
- **Conditionally required**: For RY2010 – RY2012, the standard method or industry standard practice used to measure the product quantity. [98.396(d)(2) and (3)]
- **Conditionally required**: For RY2010 – RY2012, the time (in hours) for which missing data procedures were used to estimate the blended product quantity. [98.3(c)(8)]
- The total number of blending components to be reported for the blended product [98.396(d)(1)(i)]

Table 8
Blended Products Row Details Data Element Definitions

Data Element Name	Description
BlendedProductsDetails	**Optional (Parent Element):** A collection of data elements containing information on blended products supplied, where GHG quantities were calculated using the optional procedures for blended products that do not contain biomass [98.393(i)].
BlendedProductsTableDetails	**Parent Element**: A collection of data elements containing information on blended products supplied, where GHG quantities were calculated using the optional procedures for blended products that do not contain biomass [98.393(i)].
BlendedProductsRowDetails	**Parent Element**: A collection of data elements containing information on each blended product supplied, where GHG quantities were calculated using the optional procedures for blended products that do not contain biomass [98.393(i)].
UniqueID	Unique identifier for the specified product, numbered sequentially (“1”, “2”, “3”, etc.).
IsProductEnteringOrLeavingFacility	Data element indicating whether the product is an input or output, import or export. For refineries, specify "In" if the product is entering the refinery or "Out" if the product is leaving the refinery. For importer/exporter facilities, specify "Import" if the product is being imported or "Export" if the product is being exported.

Data Element Name	Description
BlendedProductName	Report the name for the blended product.
BlendedProductIdentifier	Reporter assigned unique identifier for each blended product.
AnnualCarbonDioxideQuantity	Annual CO_2 emissions in metric tons that would result from complete combustion or oxidation of the blended product (not for individual components). Set the units of measure to "Metric Tons" in the attribute **massUOM**.
MeasurementMethod	**Conditionally required**: For RY2010 – RY2012, the standard method or industry standard practice used for the product quantity. (See the detailed instructions below this table for further information[1].)
HoursMissingDataProceduresUsed	**Conditionally required**: For RY2010 – RY2012, The time (hours) for which missing data procedures were used.
TotalNumberofBlendedComponents	The total number of blending components for the blended product.

[1]**MeasurementMethod**: Indicate the standard method or industry standard practice used for your quantity measurements. You must be specific in your description so that EPA can adequately identify the standard method or industry standard practice. 40 CFR 98.394(a) specifies that for quantity measurements, you must use an appropriate standard method published by a consensus-based standards organization. Your description should include the name of the consensus-based standard organization. Such organizations include but are not limited to ASTM, ANSI, AGA, API, ASME and NAESB. Also include identification information such as the title of the specific method used (e.g. API Manual of Petroleum Measurement Standards Chapter 5.2; ASTM D1250-80(2002); ASME MFC-18M-2001; ASME MFC-22-2007).

If no appropriate standard method exists, then you may use an industry standard practice. An industry standard practice is an approach to determine quantity that achieves a precision which most members of your industry would consider reasonable for the particular product, conditions, and circumstances. You may only use an appropriate industry standard practice to determine quantity if no standard method published by a consensus-based organization exists or would be appropriate to measure the particular product under the particular conditions and circumstances.

A delivery record itself is a record and not a quantity determination method or standard practice. The appropriate method or practice followed to determine the quantity cited in a delivery record must be reported. Third party verification is also not a quantity determination method or standard practice. The appropriate method or practice followed by the third party to determine quantity must be reported (e.g. bills of lading, invoices and custody transfers are not acceptable quantity determination methods or standard practices).

xample for Blended Products Row Details

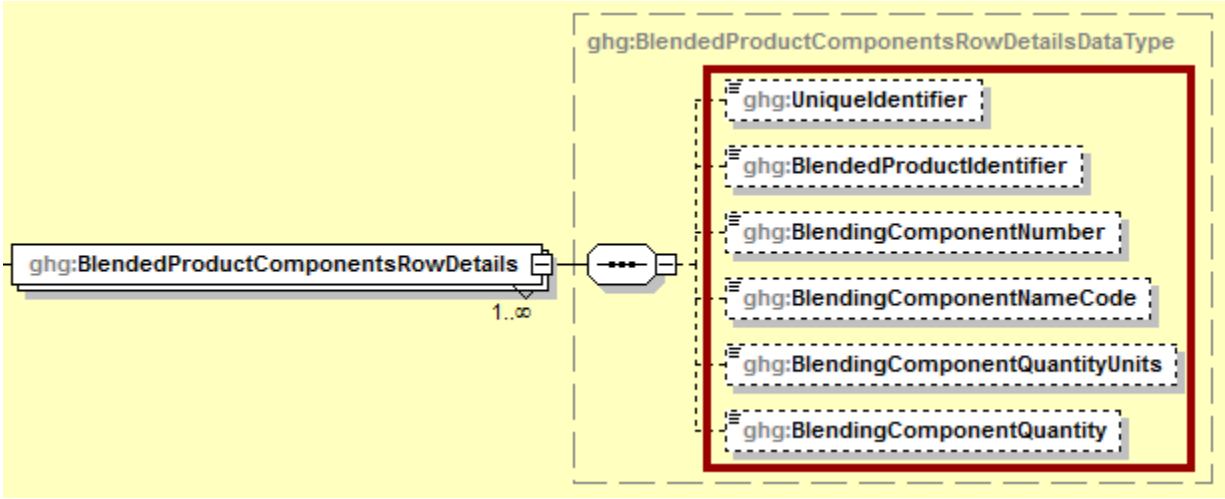
```
<BlendedProductsDetails>
    <BlendedProductsTableDetails>
            <BlendedProductsRowDetails>
                <UniqueIdentifier>1</UniqueIdentifier>
                <IsProductEnteringOrLeavingFacility>Out</IsProductEnteringOrLeavingFacility>
                <BlendedProductName>CGSR</BlendedProductName>
                <BlendedProductIdentifier>1</BlendedProductIdentifier>
                <AnnualCarbonDioxideQuantity massUOM="Metric Tons">1787650.0</AnnualCarbonDioxideQuantity>
                <MeasurementMethod>ASTM D 1250-80 (2002)</MeasurementMethod>
                <HoursMissingDataProceduresUsed>0</HoursMissingDataProceduresUsed>
                <TotalNumberOfBlendedComponents>2</TotalNumberOfBlendedComponents>
            </BlendedProductsRowDetails>
        </BlendedProductsTableDetails>
</BlendedProductsDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting blended product data for RY2010 – RY2012. For RY20113 and later omit MeasurementMethod and HoursMissingDataProceduresUsed

6.2 Blended Product Components

This subsection provides a step-by-step description of how to report the individual components for each blended product the reporter specified as outlined in the previous section of this document – 6.1 Blended Products CO_2 Quantity and Measurement Methods.

Figure 14
Blended Products Components Details Schema Diagram



Note: Please see page 4 of this document for more information on conditionally required elements.

For each specified blended product (in the previous section 6.1), report the following information:

- Unique identifier for each blended product, numbered sequentially ("1", "2", "3", etc.).
- Reporter assigned unique identifier for each blended product. **Note:** You must use the same IDs previously reported for the blended product (referenced in section 6.1 of this document). [98.396(d)]
- Unique identifier for each blended product component, numbered sequentially ("1", "2", "3", etc.). [98.396(d)(1)(i)]
- The blended product component name code listed in Table MM-1 and Table MM-2. [98.396(d)(1)(i)]
- The blended product component quantity unit of measure. Report one of the following values:
    - BBL (barrels)
    - MT (metric tons)
- The quantity of the blending product component (in the unit of measure specified above). [98.396(d)(1)(i)]

Table 9
Blended Products Components Data Element Definitions

Data Element Name	Description
BlendedProductsDetails	**Conditionally Required Parent Element:** A collection of data elements containing information on the components of supplied blended products. Required if GHG quantities were calculated using the optional procedures for blended products that do not contain biomass [98.393(i)].
BlendedProductComponentsTableDetails	**Conditionally Required Parent Element**: A collection of data elements containing information on the components of supplied blended products. Required if GHG quantities were calculated using the optional procedures for blended products that do not contain biomass [98.393(i)].
BlendedProductComponentsRowDetails	**Conditionally Required Parent Element**: A collection of data elements containing information on each component of supplied blended products. Required if GHG quantities were calculated using the optional procedures for blended products that do not contain biomass [98.393(i)].
UniqueIdentifier	Unique identifier for each specified blended product.
BlendingProductIdentifier	The reporter assigned unique identifier for the specified blended product. **Note:** You must use the same identifier previously reported for the specified blended product.
BlendingComponentNumber	Unique identifier for each blending component for the blended product, numbered sequentially (“1”, “2”, “3”, etc.).
BlendingComponentNameCode	Code corresponding to products listed on Table MM-1 and Table MM-2. Codes are available in the attached Tables MM-1 and MM-2.
BlendingComponentQuantityUnits	The unit of measure for the specified blended product component in barrels or metric tons. See list of allowable values. BBL MT
BlendingComponentQuantity	The quantity of the blending component in units specified in the immediately above data element.

XML Excerpt 8
Blended Products Components Details

```
<BlendedProductsDetails>
    <BlendedProductComponentsTableDetails>
        <BlendedProductComponentsRowDetails>
            <UniqueIdentifier>1</UniqueIdentifier>
            <BlendedProductIdentifier>1</BlendedProductIdentifier>
            <BlendingComponentNumber>1</BlendingComponentNumber>
            <BlendingComponentNameCode>RBOBSR</BlendingComponentNameCode>
            <BlendingComponentQuantityUnits>BBL</BlendingComponentQuantityUnits>
            <BlendingComponentQuantity>475000.0</BlendingComponentQuantity>
        </BlendedProductComponentsRowDetails>
        <BlendedProductComponentsRowDetails>
            <UniqueIdentifier>2</UniqueIdentifier>
            <BlendedProductIdentifier>1</BlendedProductIdentifier>
            <BlendingComponentNumber>2</BlendingComponentNumber>
            <BlendingComponentNameCode>ETBE</BlendingComponentNameCode>
            <BlendingComponentQuantityUnits>BBL</BlendingComponentQuantityUnits>
            <BlendingComponentQuantity>25000.0</BlendingComponentQuantity>
        </BlendedProductComponentsRowDetails>
    </BlendedProductComponentsTableDetails>
</BlendedProductsDetails>
```

Note: The code excerpt above is presented here to demonstrate the concept of reporting greenhouse gas quantity data for RY2013 and later

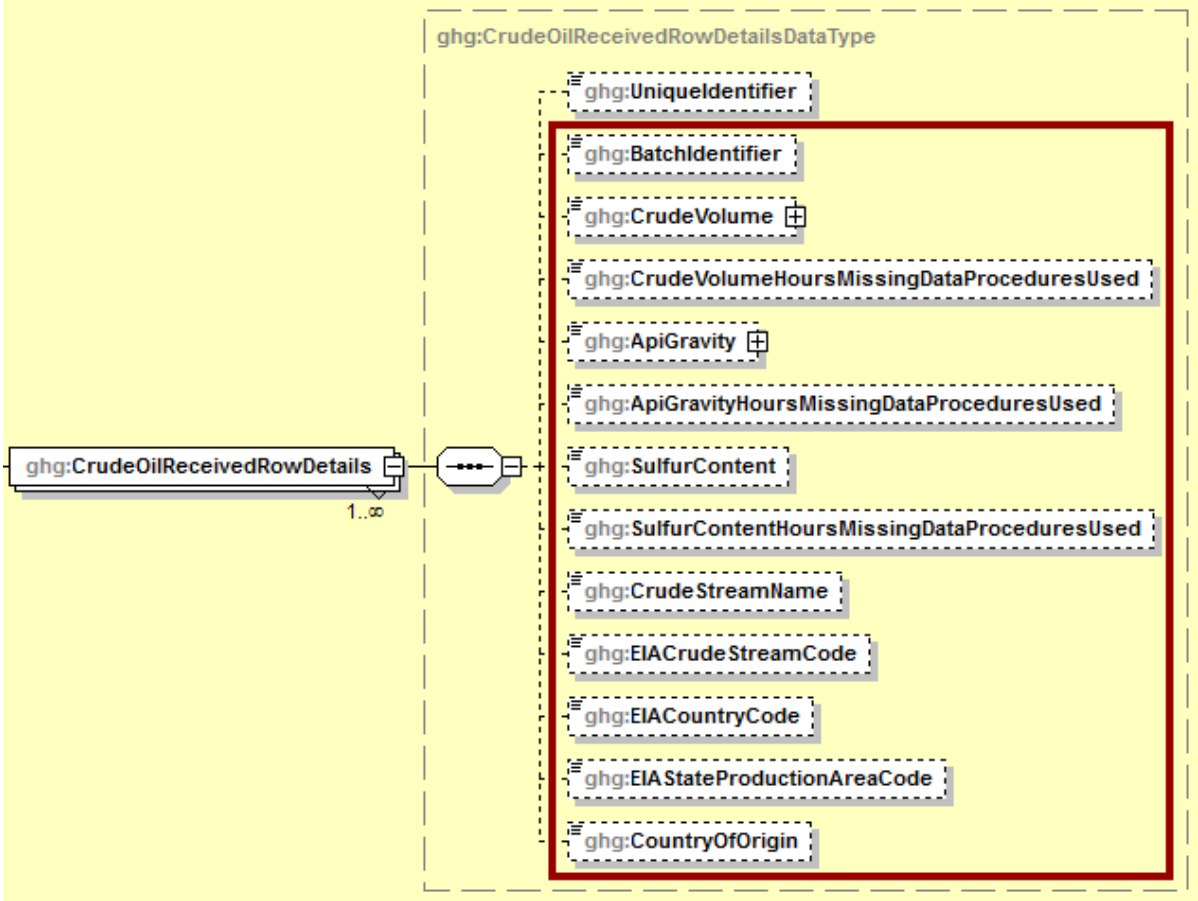
7.0 Crude Oil Received Details

This subsection provides a step-by-step description of how to report the crude oil feedstocks used at the refinery. This node is only applicable to refineries reporting in RY2010, RY2011, and RY2112. It is omitted for importer /exporters and for all facilities in RY2013 and later reporting.

If this node is used report the following information for each batch of crude oil (as specified in 98.398) used at the refinery:

- A unique identifier for each batch of crude oil. [98.396(a)(20)]
- The volume of crude batch received, in barrels. [98.396(a)(20)(i)]
- The time (hours) for which missing data procedures were used to estimate the crude volume. [98.3(c)(8)]
- The volume weighted average API gravity of the crude batch as calculated in 98.394(d)(3). [98.396(a)(20)(ii)]
- The volume weighted average sulfur content (weight percent) of the crude batch, as calculated in 98.394(d)(4). [98.394(a)(20)(iii)]
- The time (hours) for which missing data procedures were used to estimate the sulfur content of the crude batch. [98.3(c)(8)]
- The EIA crude stream name of the batch. [98.394(a)(20)(v) and (vi)]
- The EIA crude stream code, or EIA country code, or EIA State/Production Area code, or country of origin for the crude batch. [98.394(a)(20)(iv), (v) and (vi)]

Figure 15
Crude Oil Received Details Schema Diagram



Note: Each of the above elements are required for RY2010 – RY2012. Please see page 4 of this document for more information on conditionally required elements.

Table 10
Crude Oil Received Details Data Element Definitions

Data Element Name	Description
CrudeOilReceivedDetails	**Conditionally Required Parent Element:** A collection of data elements containing information on the crude oil batches received at a refinery. It is required only if the facility is a refinery.
CrudeOilReceivedTableDetails	**Conditionally Required Parent Element:** A collection of data elements containing information on the crude oil batches received at a refinery. It is required only if the facility is a refinery.

Data Element Name	Description
CrudeOilReceivedRowDetails	**Conditionally Required Parent Element:** A collection of data elements containing information on each crude oil batch received at a refinery. It is required only if the facility is a refinery.
UniqueIdentifier	Do not report.
BatchIdentifier	A unique identifier for each batch of crude oil.
CrudeVolume	The volume of crude received in this batch. Set the units of measure to "barrels" in the attribute **volUOM**.
ApiGravity	The volume weighted average API gravity of the crude batch, as calculated in 98.394(d)(3). Set the units of measure to "degrees" in the attribute **densityUOM**.
ApiGravityHoursMissingDataProceduresUsed	The number of hours in which missing data procedures were used to estimate the API gravity of the crude batch. Report values as integers (e.g., "1", "24", "53", etc.). If missing data procedures were not used, then report "0".
SulfurContent	The volume weighted average sulfur content (weight percent) of the crude batch, as calculated in 98.394(d)(4).
SulfurContentHoursMissingDataProcedures	The number of hours in which missing data procedures were used to estimate the sulfur content of the crude batch. Report values as integers (e.g., "1", "24", "53", etc.). If missing data procedures were not used, then report "0".
CrudeStreamName	The crude stream name of the batch, if known. If unknown, enter "NA".
EIACrudeStreamCode	The EIA crude stream code for the crude batch. EIA stream codes are equal to or less than five alphanumeric characters. For domestic crude oil, the one- and two-digit numeric EIA Crude Stream Codes are found on Form EIA-182. For foreign crude oil, the five-digit alpha numeric codes are found on Form EIA-856. If not known or no appropriate EIA crude stream code exists, report "NA".

Data Element Name	Description
EIACountryCode	If the Crude Stream Code is unknown (you reported "NA") and the crude batch is foreign oil, then report the two-character EIA country code. If the Crude Stream Code is unknown (your reported "NA") and the crude is domestic, then report "NA". **Note:** EIA Country Codes are the first two letters in the Crude Stream Codes found on Form EIA-856.
EIAStateProductionAreaCode	If the Crude Stream Code is unknown (you reported "NA") and the crude batch is domestic oil, then report the EIA State/Production Area Code. If the EIA State/Production Area Code is unknown, report "NA". **Note:** These codes can be found on Form EIA-182.
CountryofOrigin	If you reported "NA" to the three data elements referenced above ("CrudeStreamCode", "EIACountryCode", and "EIAStateProductionAreaCode"), then report the country of origin. If the country of origin is not known, enter "NA".

XML Excerpt 9
Example for Crude Oil Received Details

```
<CrudeOilReceivedDetails>
        <CrudeOilReceivedTableDetails>
                <CrudeOilReceivedRowDetails>
                    <UniqueIdentifier>1</UniqueIdentifier>
                    <BatchIdentifier>1</BatchIdentifier>
                    <CrudeVolume volUOM="barrels">500000</CrudeVolume>
                    <CrudeVolumeHoursMissingDataProceduresUsed>0</CrudeVolumeHoursMissingDataProceduresUsed>
                    <ApiGravity densityUOM="degrees">30.91</ApiGravity>
                    <ApiGravityHoursMissingDataProceduresUsed>0</ApiGravityHoursMissingDataProceduresUsed>
                    <SulfurContent>1.41</SulfurContent>
                    <SulfurContentHoursMissingDataProceduresUsed>0</SulfurContentHoursMissingDataProceduresUsed>
                    <CrudeStreamName>BEF31</CrudeStreamName>
                    <EIACrudeStreamCode>VE309</EIACrudeStreamCode>
                    <EIACountryCode>NA</EIACountryCode>
                    <EIAStateProductionAreaCode>NA</EIAStateProductionAreaCode>
                    <CountryOfOrigin>NA</CountryOfOrigin>
                </CrudeOilReceivedRowDetails>
        </CrudeOilReceivedTableDetails>
</CrudeOilReceivedDetails>
```

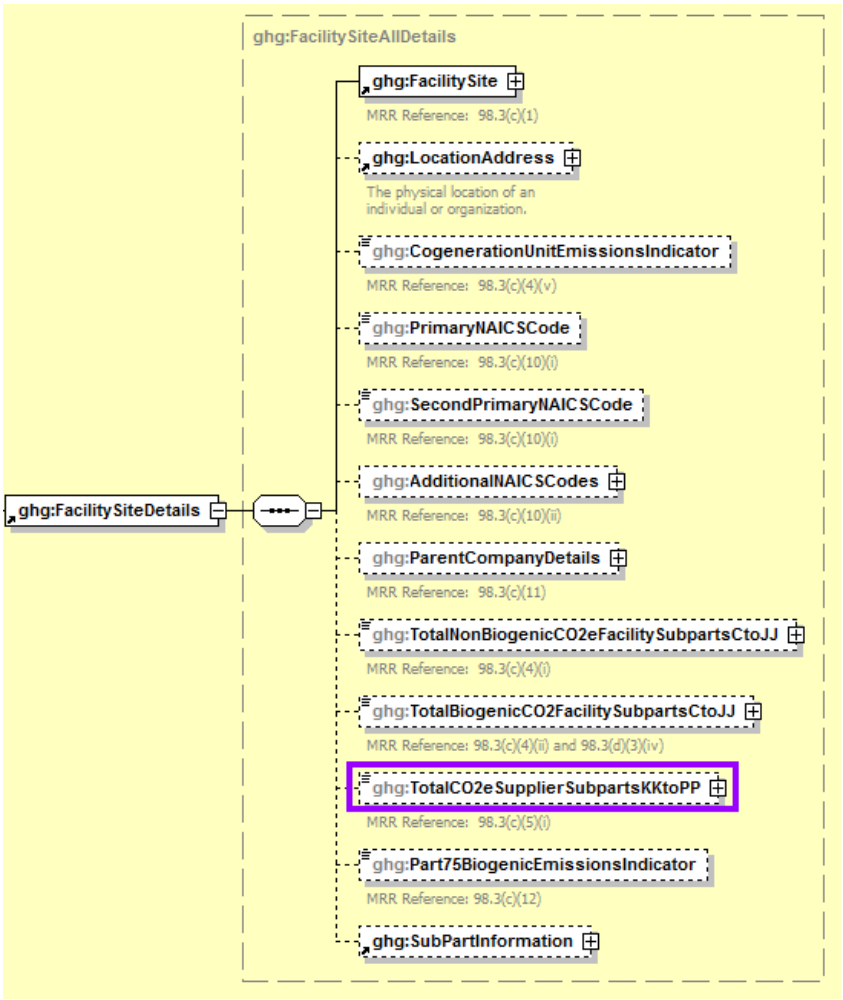
Note: The code excerpt above is presented here to demonstrate the concept of reporting data on crude oil received for RY2010 – RY2012

8.0 Supplier-Level Roll-up GHG Quantity Data

This section provides a description of how to roll up Subpart MM GHG totals into the facility's total CO_2e value, reported under Subpart A.

- Each facility must report the following facility-level GHG data:
  - Total CO_2 equivalent (CO_2e) direct emissions (excluding biogenic CO_2) aggregated across all direct emitter source categories (Subparts C-II and Subparts RR-UU) associated with the facility.
  - Total biogenic CO_2 emissions aggregated across all direct emitter source categories (Subparts C-II and Subparts RR-UU) associated with the facility.
- Each supplier must report the following supplier data:
  - Total CO_2e associated with products supplied aggregated across all supplier source categories (Subparts LL-QQ) associated with the facility.

Figure 16
Supplier-Level Roll-up GHG Quantity Data Schema Diagram



Note: Subpart MM emissions totals roll up into the data element boxed in purple (Subpart A).

For Subpart MM, add the total quantity of carbon dioxide (CO_2) to the total CO_2 equivalent (CO_2e) quantity aggregated across all supplier categories Subparts associated with the supplier using the following guidelines:

Note: You must follow the rounding rules found in Table 1.

Table 11
Supplier Level Roll-up GHG Quantity Data Element Definitions

Data Element Name	Description
TotalCO2eSupplierSubpartsKKtoPP	Add the total CO_2e value for Subpart MM in metric tons to the total CO_2e quantity data aggregated across all supplier categories associated with the supplier according to the guidelines above. Set the units of measure to "Metric Tons" in the attribute **massUOM**.

XML Excerpt 10
Example for Supplier Level Roll-up GHG Quantity Data

```
<ghg:TotalCO2eSupplierSubpartsKKtoPP massUOM="Metric Tons">5413347.5</ghg:TotalCO2eSupplierSubpartsKKtoPP>
```

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

IV. Appendix A – Product Code Tables MM-1 and MM-2

Table MM-1 to Subpart MM of Part 98—Default Factors for Petroleum Products and Natural Gas Liquids [1,2]

Product Name Code	Products	RY2010 – RY2012			RY2013 and Later		
		Column A:	Column B:	Column C:	Column A:	Column B:	Column C:
		Density	Carbon Share	Emission Factor	Density	Carbon Share	Emission Factor
		(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)	(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)
	Finished Motor Gasoline						
	Conventional—Summer						
CGSR	Regular	0.1181	86.66	0.3753	0.1181	86.66	0.3753
CGSM	Midgrade	0.1183	86.63	0.3758	0.1183	86.63	0.3758
CGSP	Premium	0.1185	86.61	0.3763	0.1185	86.61	0.3763
	Conventional—Winter						
GSWR	Regular	0.1155	86.5	0.3663	0.1155	86.5	0.3663
GSWM	Midgrade	0.1161	86.55	0.3684	0.1161	86.55	0.3684
GSWP	Premium	0.1167	86.59	0.3705	0.1167	86.59	0.3705
	Reformulated—Summer						
RFGSR	Regular	0.1167	86.13	0.3686	0.1167	86.13	0.3686
RFGSM	Midgrade	0.1165	86.07	0.3677	0.1165	86.07	0.3677
RFGSP	Premium	0.1164	86	0.367	0.1164	86	0.367
	Reformulated—Winter						
RFGWR	Regular	0.1165	86.05	0.3676	0.1165	86.05	0.3676
RFGWM	Midgrade	0.1165	86.06	0.3676	0.1165	86.06	0.3676
RFGWP	Premium	0.1166	86.06	0.3679	0.1166	86.06	0.3679
OTHERGAS	Gasoline—Other	0.1185	86.61	0.3763	0.1185	86.61	0.3763
	Blendstocks						
	CBOB—Summer						
CBOBSR	Regular	0.1181	86.66	0.3753	0.1181	86.66	0.3753

Table MM-1 to Subpart MM of Part 98—Default Factors for Petroleum Products and Natural Gas Liquids [1,2]

Product Name Code	Products	RY2010 – RY2012			RY2013 and Later		
		Column A:	Column B:	Column C:	Column A:	Column B:	Column C:
		Density	Carbon Share	Emission Factor	Density	Carbon Share	Emission Factor
		(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)	(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)
CBOBSM	Midgrade	0.1183	86.63	0.3758	0.1183	86.63	0.3758
CBOBSP	Premium	0.1185	86.61	0.3763	0.1185	86.61	0.3763
	CBOB—Winter						
CBOBWR	Regular	0.1155	86.5	0.3663	0.1155	86.5	0.3663
CBOBWM	Midgrade	0.1161	86.55	0.3684	0.1161	86.55	0.3684
CBOBWP	Premium	0.1167	86.59	0.3705	0.1167	86.59	0.3705
	RBOB—Summer						
RBOBSR	Regular	0.1167	86.13	0.3686	0.1167	86.13	0.3686
RBOBSM	Midgrade	0.1165	86.07	0.3677	0.1165	86.07	0.3677
RBOBSP	Premium	0.1164	86	0.367	0.1164	86	0.367
	RBOB—Winter						
RBOBWR	Regular	0.1165	86.05	0.3676	0.1165	86.05	0.3676
RBOBWM	Midgrade	0.1165	86.06	0.3676	0.1165	86.06	0.3676
RBOBWP	Premium	0.1166	86.06	0.3679	0.1166	86.06	0.3679
OTHERBOB	Blendstocks—Other	0.1185	86.61	0.3763	0.1185	86.61	0.3763
	Oxygenates						
MTOH	Methanol	0.1268	37.48	0.1743	0.1268	37.48	0.1743
GTBA	GTBA	0.1257	64.82	0.2988	0.1257	64.82	0.2988
MTBE	MTBE	0.1181	68.13	0.295	0.1181	68.13	0.295
ETBE	ETBE	0.1182	70.53	0.3057	0.1182	70.53	0.3057
TAME	TAME	0.1229	70.53	0.3178	0.1229	70.53	0.3178
DIPE	DIPE	0.1156	70.53	0.299	0.1156	70.53	0.299
	Distillate Fuel Oil						
	Distillate No. 1						

Table MM-1 to Subpart MM of Part 98—Default Factors for Petroleum Products and Natural Gas Liquids [1,2]

Product Name Code	Products	RY2010 – RY2012			RY2013 and Later		
		Column A:	Column B:	Column C:	Column A:	Column B:	Column C:
		Density	Carbon Share	Emission Factor	Density	Carbon Share	Emission Factor
		(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)	(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)
DFO1UL	Ultra Low Sulfur	0.1346	86.4	0.4264	0.1346	86.4	0.4264
DFO1LS	Low Sulfur	0.1346	86.4	0.4264	0.1346	86.4	0.4264
DFO1HS	High Sulfur	0.1346	86.4	0.4264	0.1346	86.4	0.4264
	Distillate No. 2						
DFO2UL	Ultra Low Sulfur	0.1342	87.3	0.4296	0.1342	87.3	0.4296
DFO2LS	Low Sulfur	0.1342	87.3	0.4296	0.1342	87.3	0.4296
DFO2HS	High Sulfur	0.1342	87.3	0.4296	0.1342	87.3	0.4296
DFO4	Distillate Fuel Oil No. 4	0.1452	86.47	0.4604	0.1452	86.47	0.4604
DFO5	Residual Fuel Oil No. 5 (Navy Special)	0.1365	85.67	0.4288	0.1365	85.67	0.4288
DFO6	Residual Fuel Oil No. 6 (a.k.a. Bunker C)	0.1528	84.67	0.4744	0.1528	84.67	0.4744
KEROJET	Kerosene-Type Jet Fuel	0.1294	86.3	0.4095	0.1294	86.3	0.4095
KEROSENE	Kerosene	0.1346	86.4	0.4264	0.1346	86.4	0.4264
OTHERDFO	Diesel—Other	0.1452	86.47	0.4604	0.1452	86.47	0.4604
	Petrochemical Feedstocks						
PCFNAP	Naphthas (< 401 °F)	0.1158	84.11	0.3571	0.1158	84.11	0.3571
PCFOO	Other Oils (> 401 °F)	0.139	87.3	0.445	0.139	87.3	0.445
	Unfinished Oils						
PCFHGO	Heavy Gas Oils	0.1476	85.8	0.4643	0.1476	85.8	0.4643
PCFR	Residuum	0.1622	85.7	0.5097	0.1622	85.7	0.5097
	Other Petroleum Products and Natural Gas Liquids						
AVGAS	Aviation Gasoline	0.112	85	0.349	0.112	85	0.349

Table MM-1 to Subpart MM of Part 98—Default Factors for Petroleum Products and Natural Gas Liquids [1,2]

Product Name Code	Products	RY2010 – RY2012			RY2013 and Later		
		Column A:	Column B:	Column C:	Column A:	Column B:	Column C:
		Density	Carbon Share	Emission Factor	Density	Carbon Share	Emission Factor
		(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)	(metric tons/bbl)	(% of mass)	(metric tons CO_2/bbl)
SPNAPS	Special Naphthas	0.1222	84.76	0.3798	0.1222	84.76	0.3798
LUBES	Lubricants	0.1428	85.8	0.4492	0.1428	85.8	0.4492
WAXES	Waxes	0.1285	85.3	0.4019	0.1285	85.3	0.4019
PTROCOKE	Petroleum Coke	0.1818	92.28	0.6151	0.1818	92.28	0.6151
ARO	Asphalt and Road Oil	0.1634	83.47	0.5001	0.1634	83.47	0.5001
STILGAS	Still Gas	0.1405	77.7	0.4003	0.1405	77.7	0.4003
C2H6	Ethane	0.0866	79.89	0.2537	0.0579	79.89	0.170
C2H4	Ethylene	0.0903	85.63	0.2835	0.0492	85.63	0.154
C3H8	Propane	0.0784	81.71	0.2349	0.0806	81.71	0.241
C3H6	Propylene	0.0803	85.63	0.2521	0.0827	85.63	0.260
C4H10	Butane	0.0911	82.66	0.2761	0.0928	82.66	0.281
C4H8	Butylene	0.0935	85.63	0.2936	0.0972	85.63	0.305
IC4H10	Isobutane	0.0876	82.66	0.2655	0.0892	82.66	0.270
IC4H8	Isobutylene	0.0936	85.63	0.2939	0.0949	85.63	0.298
C5PLUS	Pentanes Plus	0.1055	83.63	0.3235	0.1055	83.63	0.3235
MISCPROD	Miscellaneous Products	0.138	85.49	0.4326	0.138	85.49	0.4326

[1] In the case of products blended with some portion of biomass-based fuel, the carbon share in Table MM-1 of this subpart represents only the petroleum-based components.

[2] Products that are derived entirely from biomass should not be reported, but products that were derived from both biomass and a petroleum product (i.e., co-processed) should be reported as the petroleum product that it most closely represents.

Table MM-2 to Subpart MM of Part 98—Default Factors for Biomass-Based Fuels and Biomass

Product Name Code	Biomass-Based Fuel and Biomass	Column A: Density (metric tons/bbl)	Column B: Carbon Share (% of mass)	Column C: Emission Factor (metric tons CO_2/bbl)
ETOH	Ethanol (100%)	0.1267	52.14	0.2422
BIODSL	Biodiesel (100%, methyl ester)	0.1396	77.3	0.3957
RAFAT	Rendered Animal Fat	0.1333	76.19	0.3724
VEGOIL	Vegetable Oil	0.146	76.77	0.411

Appendix B – EIA Alpha Codes for State and Production Areas

EIA ALPHA CODES FOR STATE AND PRODUCTION AREAS	
State/Production Area	**Code**
Alabama	AL
Montana	MT
Alaska - North Slope	AN
Nebraska	NE
Alaska - South (incl. State waters)	AS
Nevada	NV
Arizona	AZ
New Mexico	NM
Arkansas	AR
New York	NY
California - Mainland (incl. State waters)	CA
North Dakota	ND
California – OCS	CC
Ohio	OH
Colorado	CO
Oklahoma	OK
Florida	FL
Pennsylvania	PA
Gulf Coast - OCS (off Louisiana & Texas)	GC
South Dakota	SD
Illinois	IL
Tennessee	TN
Indiana	IN
Texas - Mainland (incl. State waters)	TX
Kansas	KS
Utah	UT
Kentucky	KY
Virginia	VA
Louisiana - Mainland (incl. State waters)	LA
West Virginia	WV
Michigan	MI
Wyoming	WY
Mississippi	MS
Missouri	MO

V. Appendix C – Sample XML Document for Subpart MM

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

This samples demonstrates a XML submission as applicable to RY2010 – RY2012.

```
<GHG xmlns="http://www.ccdsupport.com/schema/ghg">
    <FacilitySiteInformation>
        <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.</CertificationStatement>
        <ReportingYear>2012</ReportingYear>
        <FacilitySiteDetails>
            <FacilitySite>
                <FacilitySiteIdentifier>526297</FacilitySiteIdentifier>
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            </FacilitySite>
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                <LocationAddressText>123 West Main Street</LocationAddressText>
                <LocalityName>Westwood</LocalityName>
                <StateIdentity>
                    <StateCode>CA</StateCode>
                </StateIdentity>
                <AddressPostalCode>90987</AddressPostalCode>
            </LocationAddress>
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            <ParentCompanyDetails>
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                    <StreetAddress>1111 Caterton Way</StreetAddress>
                    <City>Arlington</City>
                    <State>VA</State>
                    <Zip>23545</Zip>
                    <PercentOwnershipInterest>100</PercentOwnershipInterest>
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This sample demonstrates a XML submission as applicable to RY2013 and later.

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