

# **ECMPS Reporting Instructions Emissions**

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# ECMPS Reporting Instructions

## Emissions

### 1.0 Introduction: Emissions

#### About This Document

In the Emissions Collection and Monitoring Plan System (ECMPS), data must be submitted to the EPA through the Client Tool using extensible-markup language (XML) format. XML files must contain certain data elements, which are defined in the XML schema. (Note: More information about the ECMPS XML Schemas can be found in the XML Schema Description Documents.)

The purpose of the reporting instructions is to provide the necessary information for owners and operators to meet the reporting requirements for sources affected by:

- 1) The Acid Rain Program (ARP);
- 2) The Cross-State Air Pollution Rule (CSAPR);
- 3) The Mercury and Air Toxic Standards Rule (MATS); and
- 4) Other programs required to report data using these XML schemas.

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.

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

The elements are related to each other in parent-child relationships. The root element is the parent element of the entire schema. Complex elements are children of the root element, and complex elements can also be children of other complex elements. If a complex element is dependent on a parent complex element, the child complex element cannot be included in the XML file unless the appropriate parent complex element is also included. Figure 1 below illustrates the relationships between the emissions root element and the complex elements.

This document provides instructions on how the required data should be reported using this data structure. For each complex element, this document includes a separate section which includes:

- **Element Overview:** An overview of the kinds of data submitted under the element, including general information not specific to any associated child complex elements or simple elements
- **Element XML Model:** A model diagram of the element and any associated child complex elements or simple elements
- **Element XML Elements:** Instructions for submitting data for each associated simple element

- **Specific Considerations:** Additional considerations, including information that applies to particular types of monitoring plan configurations

### About Emissions Data

Emissions data are hourly values for measured parameters, calculated hourly emissions values, instrument calibration data, and aggregated summary data. An emissions file contains one calendar quarter of hourly and aggregate emissions measurements for a specified unit or group of related units, including stacks and pipes.

Each unit that is required to submit emissions data for a particular calendar quarter must be included in one and only one emissions file for that quarter. Each emissions file should contain all relevant operating, daily quality assurance, and emissions data for all units, common stacks, multiple stacks, or common pipes that were in a common monitoring configuration for any part of the quarter.

You must submit an emissions file for each quarter or, for ozone season only reporters, for the second and third calendar quarters of each year.

### Rounding Conventions for Reporting Emissions Values

Each emissions value that is reported must be rounded to a specified precision (e.g., a certain number of decimal places or significant digits). The appropriate precision is based on the parameter, fuel type, and/or record type. Because some fields were designed to be generic and support reporting data for different parameters, it is not always appropriate to report values to the precision in the XML format. The appropriate precision for each parameter (and fuel type) can be found in the instructions under each record type.

Use the standard arithmetic rounding convention where numbers five through nine round to the next highest number in the previous decimal position to the left.

For example, when reporting SO<sub>2</sub>C, NO<sub>x</sub>C, CO<sub>2</sub>C, O<sub>2</sub>C, or H<sub>2</sub>O in the MONITOR HOURLY VALUE DATA (MHV) record, round these values to the nearest 0.1 ppm or 0.1 percent (as applicable). When reporting FLOW, the last significant digit in the reported flow rate values is in the thousands place; fill in zeros in the hundreds, tens, and unit columns (e.g., round 15,922,855 scfh to 15,923,000 scfh). When reporting NO<sub>x</sub>R in the DERIVED HOURLY VALUE DATA (DHV) record, round the NO<sub>x</sub> emission rate to three decimal places.

### Use of Rounded and Unrounded Values in Emissions Calculations

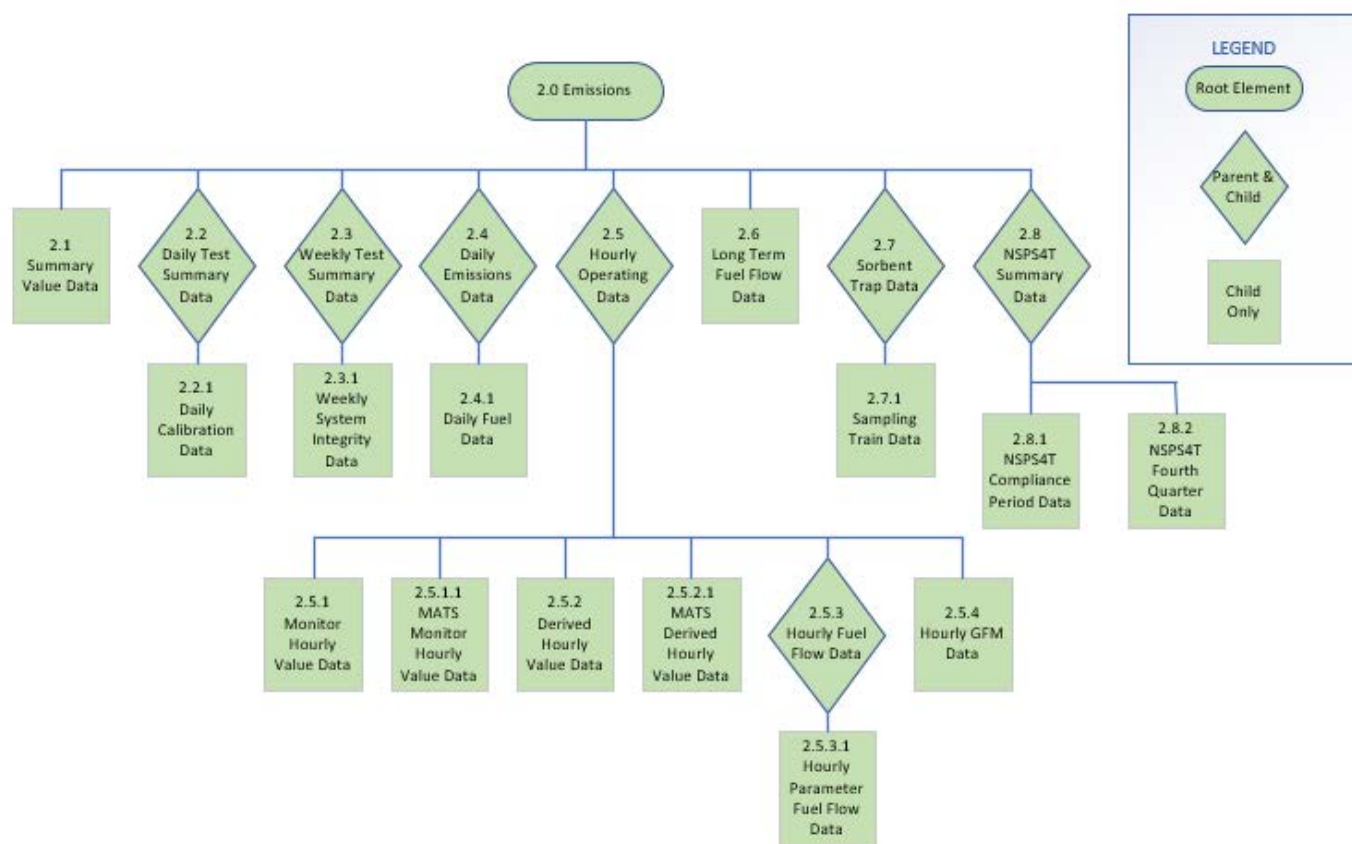
When performing calculations using any value that is reported in the XML, use the value as it is reported. In other words, use the rounded value in the calculation. However, any value that is calculated in an intermediate equation but is not reported should not be rounded before using it in a subsequent equation.

For example, to calculate the bias-adjusted SO<sub>2</sub> concentration, multiply the UnadjustedHourlyValue in the SO<sub>2</sub>C MHV record (which has been reported as a value rounded to one decimal place) by the bias adjustment factor (which has been reported in the RATA as a value rounded to three decimal places), and round the result to one decimal place before

reporting this value as the AdjustedHourlyValue in the MHV record. To calculate the hourly SO<sub>2</sub> mass rate in lb/hr using formula F-1, use the AdjustedHourlyValue in the SO<sub>2</sub>C MHV record (which has been rounded to one decimal place) and AdjustedHourlyValue in the FLOW MHV record (which has been rounded to the nearest thousand) in the equation, and round the result to one decimal place before reporting this value as the AdjustedHourlyValue in the SO<sub>2</sub> DHV record. When calculating quarterly SO<sub>2</sub> emissions in tons, first multiply the AdjustedHourlyValue in the SO<sub>2</sub> DHV record (which has been rounded to one decimal place) by the OperatingTime (which has been rounded to two decimal places) for every hour. Sum these unrounded products, then divide this unrounded sum by 2,000. Finally, round the result to one decimal place before reporting the quarterly emissions value in SUMMARY VALUE DATA record.

(Note: When the appropriate substitute data value for a particular parameter is the average of the values recorded in the hour before and the hour after the missing data period, you must round off the average value to the appropriate precision for the parameter.)

**Figure 1: Emissions XML Schema Complex Elements**





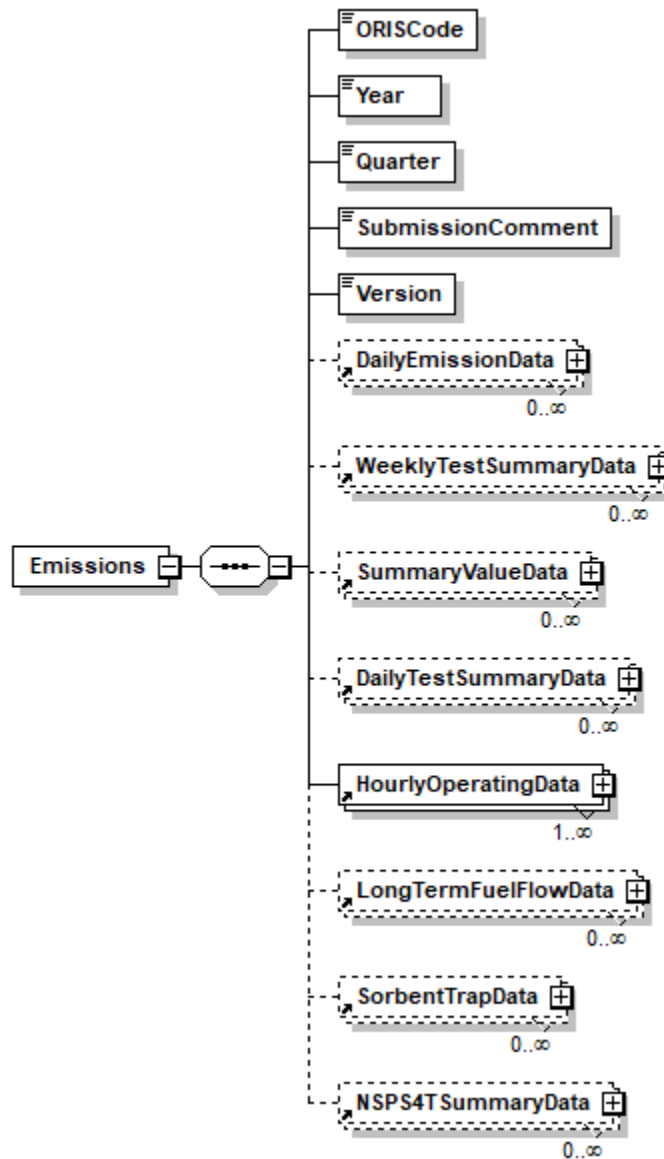
## 2.0 Emissions

### Emissions Overview

The EMISSIONS record is the root element for the Emissions data XML schema. This element identifies the source for which emissions data are being reported. In addition, it provides information about the reporting period for which data are provided by identifying the year and quarter. Include a single EMISSIONS record in each Emissions data file.

### Emissions XML Model

**Figure 2: Emissions XML Elements**



**Emissions XML Elements****ORIS Code** (*ORISCode*)

Report the code that indicates the unique identification number given to a source by the Energy Information Administration (EIA).

**Year** (*Year*)

Report the calendar year represented by the data in the file.

**Quarter** (*Quarter*)

Report the calendar quarter represented by the data in the file. Be sure that the reported year and quarter are properly matched to the time period of the emissions data.

**Submission Comment** (*SubmissionComment*)

This field can be used to report additional information or provide an explanation about an event that is specific to the quarterly report. Report the text of the comment in this field.

**Version** (*Version*)

Report the XML schema version number. Note that this is a numeric field -- do not include a "v" before the number.

## 2.1 Summary Value Data

### Summary Value Data Overview

The SUMMARY VALUE DATA records are used to report aggregated quarterly values for the parameters included in the emissions submission file and cumulative values for the year and/or ozone season that are the required under Part 75. Summary values are reported by monitoring location and parameter on basis of the current reporting period, year-to-date, and, if relevant, ozone season-to-date sums (or averages). For each monitoring location in the file, report a SUMMARY VALUE DATA record for operating time and another for operating hours. Also report a SUMMARY VALUE DATA record for each parameter measured or calculated at that location to meet a regulatory requirement. See Table 1 below for applicable parameters.

For units required to report heat input (HI), you must include for each unit a SUMMARY VALUE DATA record for HI whether the HI was actually measured at the unit level or apportioned (or summed) from another location or multiple locations.

Sources are not required to report quarterly or cumulative values for any MATS affected pollutants.

#### **Common Stacks or Pipes**

The reporting period and cumulative heat input values for the stack or pipe (in mmBtu) must equal the sum of the HIs for the units associated with the stack or pipe. For the individual units, report SUMMARY VALUE DATA records only for HI, operating time, and operating hours. Do not apportion SO<sub>2</sub> mass emissions, CO<sub>2</sub> mass emissions, or average NO<sub>x</sub> emission rates to the individual units.

#### **Multiple Stacks or Pipes**

For these configurations, report only the reporting period and cumulative HI, operating time, operating hours, and weighted average NO<sub>x</sub> emission rates in the unit-level SUMMARY VALUE DATA records. Do not report quarterly and cumulative SO<sub>2</sub> or CO<sub>2</sub> mass emissions at the unit level. The reported quarterly or cumulative HI value for the unit must equal the sum of the corresponding HI values reported for the individual stacks, ducts, or pipes.

#### **Complex Stack Configurations**

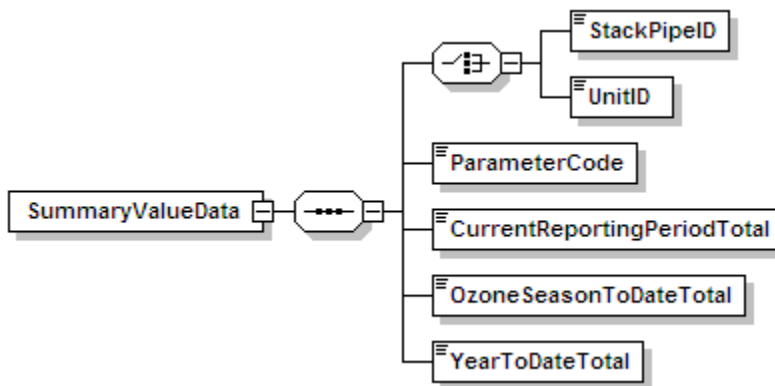
A complex stack configuration exists where a unit's emissions are measured at more than one stack location and where at least one of these stack locations is a common stack shared with one or more other units.

For the purposes of quarterly and cumulative HI accounting, the sum of the HIs for all units associated with all stacks in a complex configuration must equal the sum of the stack HIs for all of the stacks. For example, if emissions from scrubbed Units 1, 2, and 3 are measured at CS1 during normal unit operation and are measured at CS2 during scrubber bypass hours, the sum of the HIs for Units 1, 2, and 3 must equal the sum of the HIs for CS1 and CS2.

See “Specific Considerations” below for information about how to calculate summary values.

Summary Value Data XML Model

**Figure 3: Summary Value Data XML Elements**



Summary Value Data XML Elements

**Unit ID or Stack Pipe ID** (*UnitID or StackPipeID*)

Report either the Unit ID or Stack Pipe ID that corresponds to the summary data value location. This is the alphanumeric code assigned by a source to identify a unit, stack, or pipe.

**Parameter Code** (*ParameterCode*)

Report the Parameter Code for the parameter summarized by this SUMMARY VALUE DATA record. Use the appropriate uppercase code as shown in Table 1.

**Table 1: Parameter Codes and Descriptions for Summary Value Data**

Code	Description
BCO2	Biogenic CO <sub>2</sub> Mass (tons) (Only for RGGI affected units)
CO2M	Carbon Dioxide Mass (tons)
HIT	Heat Input Total (mmBtu)
NOXM	Nitrogen Oxide Mass (tons)
NOXR	Nitrogen Oxide Rate (lb/mmBtu)
OPTIME	Operating Time (hr)
OPHOURS	Number of Operating Hours
SO2M	Sulfur Dioxide Mass (tons)

**Current Reporting Period Total** (*CurrentReportingPeriodTotal*)

Report the cumulative parameter value (i.e., emissions or time) as measured from the beginning of the current reporting period to the end of the current reporting period. This will generally be the quarterly total (or average), except for the second calendar quarter file for ozone season only reporters. For those files, this value is the total (or average) for just May and June. The value

should be rounded to the number of decimal places according to Table 2. If there was no operation at this location during the reporting period, report zero.

### **Ozone Season to Date Total** (*OzoneSeasonToDateTotal*)

For locations subject to ozone season only programs, report the cumulative parameter value (i.e., emissions or time) for the ozone season as follows: For a first quarter report, leave this field blank. For a second quarter report, report the sum parameter value (i.e., emissions or time) from the beginning of the ozone season (May 1) to the end of the reporting period. For a third quarter report, report the sum of the Ozone Season to Date Total value reported in the second quarter plus the quarterly value for the parameter reported for the third quarter. For a fourth quarter report, report the Ozone Season to date total from the third quarter report. All values should be rounded to the number of decimal places according to Table 2. If there was no operation at this location during the ozone season, report zero. For locations not subject to ozone season only programs, leave this field blank.

### **Year to Date Total** (*YearToDateTotal*)

For locations that report year-round, report the cumulative sum of current year quarterly totals for each parameter value (i.e., emissions or time) as follows: For a first quarter report, report the sum parameter value (i.e., emissions or time) for the quarter. For subsequent quarters, report the sum of the current reporting period plus the quarterly values for the parameter reported in the previous quarters. For example, the Year to Date total for quarter three would be calculated by summing the current quarter three reporting period value with the previously reported quarter one and quarter two values. The value should be rounded to the number of decimal places according to Table 2. If there was no operation at this location during the calendar year-to-date, report zero. For ozone season only reporters, leave this field blank.

**Table 2: Precision of Reported Values for Summary Value Data**

Parameter Codes	Number of Decimal Places
CO2M, NOXM, SO2M, BCO2	One
OPTIME	Two
NOXR	Three
HIT	Zero

## **Specific Considerations**

### **Operating Time and Operating Hours**

Operating Time is the sum of the hourly OperatingTime in HOURLY OPERATING DATA records. Operating Hours is a count of HOURLY OPERATING DATA records with OperatingTime greater than zero.

### **SO2M, NOXM, HIT, and CO2M from Hourly Data**

- For non-Low Mass Emissions (LME) locations, to calculate Reporting Period, Year to Date, and Ozone Season to Date totals for SO2M, and NOXM, multiply each hourly rate value reported in the DERIVED HOURLY VALUE record by the corresponding operating time in the HOURLY OPERATING record, sum those values, and then divide by 2,000.

Round the resulting sum to the appropriate number of decimal places per Table 2. For CO<sub>2</sub>M, follow the same procedure but do not divide by 2,000.

- For LME units, to calculate Reporting Period, Year to Date, and Ozone Season to Date totals for SO<sub>2</sub>M, NO<sub>x</sub>M, and HIT, sum the values in the DERIVED HOURLY VALUE records and divide the total SO<sub>2</sub>M and NO<sub>x</sub>M by 2,000 to determine total tons for each respective period (i.e. calendar quarter, Year to Date and Ozone Season). Round the resulting sum to the appropriate number of decimal places per Table 2. For CO<sub>2</sub>M, follow the same procedure but do not divide by 2,000.
- If a common fuel pipe (or supply tank) serves a group of LME units and the long-term fuel flow option is used to quantify heat input, report the cumulative heat input for the group of units under the common pipe (or tank) ID. If more than one common pipe (or tank) serves the same group of LME units, report a separate SUMMARY VALUE DATA record for Total Heat Input (HIT) for each pipe (or tank).

### CO<sub>2</sub>M from Daily Data

If CO<sub>2</sub> mass is calculated on a daily basis and reported in the DAILY EMISSIONS DATA record, calculate Reporting Period, Year to Date, and Ozone Season to Date for CO<sub>2</sub>M by summing the values in these records. Round the resulting sum to the appropriate number of decimal places per Table 2.

### NO<sub>x</sub> Emission Rate

- For non-Acid Rain units, do not report a SUMMARY VALUE DATA record for NO<sub>x</sub>R, even if the NO<sub>x</sub> emission rate is calculated on an hourly basis for the purpose of determining NO<sub>x</sub> mass rate (lb/hr).
- For single unit or monitored common stack configurations, calculate each summary NO<sub>x</sub> emission rate as a straight arithmetic average of the NO<sub>x</sub> emission rates for all operating hours in the reporting period, ozone season, or year-to-date period, as reported in the DERIVED HOURLY VALUE DATA. If the recorded NO<sub>x</sub> emission rate is zero, include these hours in the average only if the operating time for the hour is greater than zero.
- Do not weight the quarterly or cumulative average NO<sub>x</sub> emission rate for partial operating hours (i.e., count all hourly NO<sub>x</sub> emission rates equally, irrespective of the unit operating time). Report both the quarterly and cumulative average NO<sub>x</sub> emission rates for the unit or stack to three decimal places.
- For simple multiple stack or multiple duct configurations in which NO<sub>x</sub> emissions and heat input are monitored separately in each of the stacks or ducts, you must calculate and report the quarterly and cumulative arithmetic average NO<sub>x</sub> emission rate for each stack or duct, and you must also calculate and report a quarterly and cumulative heat input-weighted NO<sub>x</sub> emission rate for the unit. Determine the heat input-weighted averages for the unit as follows. First, use the reported hourly data (i.e., stack level NO<sub>x</sub> emission and heat input rates) and the following formula to calculate a heat input-weighted unit NO<sub>x</sub> emission rate for each stack operating hour in the quarter:

$$\text{Hourly Unit NO}_x \text{ Emission Rate (lb/mmBtu)} = \frac{(\text{NO}_x \text{ Rate})_A(\text{Heat Input})_A + (\text{NO}_x \text{ Rate})_B(\text{Heat Input})_B}{(\text{Heat Input})_A + (\text{Heat Input})_B}$$

- In the formula above, the term “Heat Input” for multiple stack A or B is the product of the hourly HI rate for the stack and the corresponding operating time for the stack.
- When a multiple-stack configuration is selected for a combined-cycle combustion turbine (CT) that: (a) uses the provisions of Appendix D to Part 75 for unit HI; and (b) has a main stack and bypass stack configuration; and (c) has NO<sub>x</sub>-diluent monitoring systems on both the main and bypass stacks, the mathematics are slightly different. In this case, for any unit operating hour in which gases flow through both stacks for any part of the hour, a time-weighted, rather than a heat-input-weighted unit-level NO<sub>x</sub> emission rate is calculated, using an equation similar to the one above, except that the terms “(Heat Input)A” and “(Heat Input)B” are replaced with tA and tB, respectively, where tA and tB are the main stack operating time and bypass stack operating time, respectively. The time-weighted hourly average NO<sub>x</sub> emission rates are then used to determine the quarterly and cumulative NO<sub>x</sub> emission rates for the unit.
- The quarterly heat input-weighted average NO<sub>x</sub> emission rate for the unit is then determined by taking the sum of all of the hourly heat input-weighted NO<sub>x</sub> emission rates for the quarter and dividing this sum by the total number of unit operating hours in the quarter. In determining the number of unit operating hours in the quarter, each partial operating hour is counted as a full hour of unit operation. The cumulative heat input-weighted average NO<sub>x</sub> emission rate for the unit is determined in the same way as the quarterly average for the unit, except that the terms “for the quarter” and “in the quarter” are replaced, respectively, with the terms, “for the year, to date” and “in the year, to date.”
- For Acid Rain Program (ARP) LME units, determine the quarterly average NO<sub>x</sub> emission rate for each unit as follows: Sum all of the hourly NO<sub>x</sub> mass values from the DERIVED HOURLY VALUE records for NO<sub>x</sub> to get the total NO<sub>x</sub> mass for the quarter. Then, sum the hourly HI values from the DERIVED HOURLY VALUE records for HI to obtain the HIT for the quarter. Divide the total NO<sub>x</sub> mass for the quarter by the total quarterly HI, to determine the quarterly NO<sub>x</sub> emission rate in lb/mmBtu. Calculate the cumulative (year-to-date) NO<sub>x</sub> emission rate by separately summing the hourly NO<sub>x</sub> mass and HI values over all operating hours in all quarters, and then dividing the NO<sub>x</sub> mass sum by the HI sum.

## 2.2 Daily Test Summary Data

### Daily Test Summary Data Overview

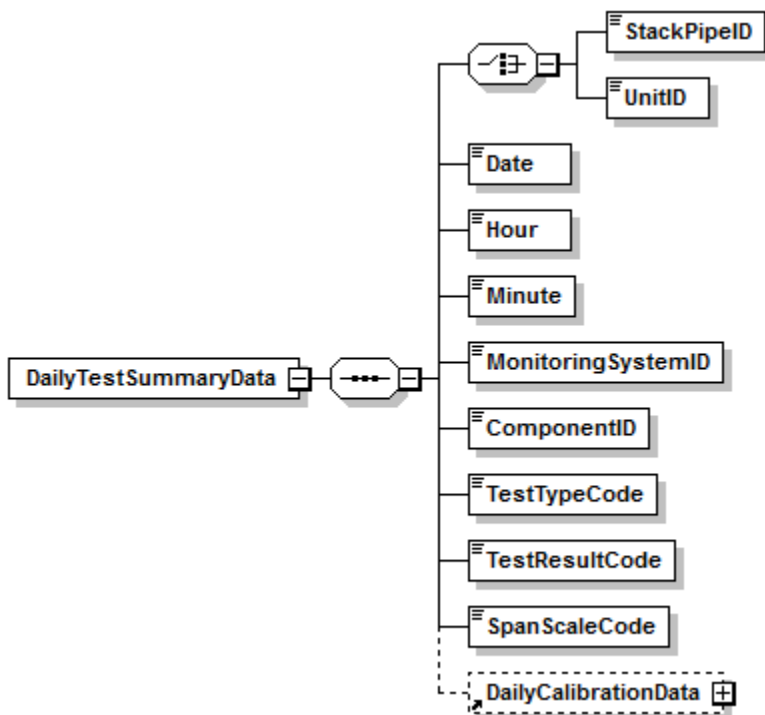
The DAILY TEST SUMMARY DATA record summarizes the completion date and time and the results (Passed/Failed/Aborted) for each daily calibration error test and flow interference check. For each calibration error test, report the calibration test data in the DAILY CALIBRATION DATA record (see instructions for that record below). Also use the DAILY TEST SUMMARY DATA record to report the results of the daily Predictive Emissions Monitoring System (PEMS) calibration for units with an approved PEMS monitoring method.

Report the results of all failed, passing, and incomplete calibrations that affect data validation. For redundant backup monitors, the results of daily calibration error tests need not be reported except on days when using the monitors to report emissions data.

Do not report the results of off-line calibrations performed during periods of non-operation of the unit or stack unless the unit has passed the off-line calibration demonstration and is using off-line calibrations to validate data. The off-line calibration demonstration provision only applies to CEMS data monitored under Part 75.

### Daily Test Summary Data XML Model

Figure 4: Daily Test Summary Data XML Elements





**Daily Test Summary Data XML Elements****Unit ID or Stack Pipe ID** (*UnitID or StackPipeID*)

Report either the Unit ID or Stack Pipe ID for the daily test location. This is the alphanumeric code assigned by a source to identify a unit or stack.

**Date** (*Date*)

For daily calibrations, report the date corresponding to the completion of the last gas injection of the test. For interference checks, report the date on which the test was completed.

**Hour** (*Hour*)

For daily calibrations, report the hour corresponding to the completion of the last gas injection of the test. For interference checks, report the hour in which the test was completed.

**Minute** (*Minute*)

For daily calibrations, report the minute corresponding to the completion of the last gas injection of the test. For interference checks, report the minute in which the test was completed.

**Monitoring System ID** (*MonitoringSystemID*)

If this is a PEMS Calibration test, report the three-character Monitoring System ID for the NOXP system. Leave this field blank for other parameters.

**Component ID** (*ComponentID*)

Report the three-character ID assigned to the component. Leave this field blank for PEMSCAL.

**Test Type Code** (*TestTypeCode*)

Report the test type code as DAYCAL for a daily calibration test summary record, or as INTCHK for an interference check. For units with an approved PEMS methodology, report the test type code as PEMSCAL for daily PEMS calibration tests.

**Test Result Code** (*TestResultCode*)

Report the test result code as PASSED, PASSAPS, FAILED, INC, or ABORTED. See detailed descriptions of each code in Table 3.

**Table 3: Daily Test Result Code Descriptions**

<b>Code</b>	<b>Description</b>
PASSED	Report this code whenever the standard performance specification is met for the test. For daily calibration error tests, report the test as passed only if the zero and upscale-level calibration error test injections each pass the standard performance specification in sequence. Partial calibrations, where only one injection level is completed and passes the performance specification, may not be reported as "PASSED." Rather, these may either be omitted from the electronic report or reported as "INC."
PASSAPS	This code applies to daily calibration tests only. Report this code whenever the standard performance specification is not met for one or both injections, but the alternative performance specification (as described in Part 75, Appendix B, Section 2.1.4(a) or in Appendix A to 40 CFR Part 63, Subpart UUUUU (as applicable)) is met for whichever injections did not meet the standard specification.

Code	Description
FAILED	Report this code whenever the applicable performance specification is not met for the test. For daily calibration error tests, report the test as failed whenever either the zero-level calibration error test or upscale-level calibration error test (or both) cannot meet either the applicable standard or alternative performance specification. Data for the systems associated with the specified component will be considered invalid until a subsequent retest is passed.
INC	Report this code whenever a calibration error test is not completed at both required calibration levels and the completed calibration injection passes the applicable performance specification tests. Incomplete tests have no effect on data validation and do not satisfy the daily calibration requirements of Part 75 or Part 63, Subpart UUUUU.
ABORTED	Report this code whenever a test is aborted due to a malfunction of the monitoring system. Data for the systems associated with the specified component will be considered invalid until a subsequent retest is passed. Partial calibrations, where only one injection level is completed and failed, must be reported as "FAILED."

**Span Scale Code** (*SpanScaleCode*)

For Daily Calibration tests, report whether the component or the range of the instrument tested is high (H) or low (L) scale (If the component is a single range and no default high range is in use, enter "H"). Report a span scale of high (H) for Hg and HCl monitor components. Do not report a span scale code for flow monitor components.

## 2.2.1 Daily Calibration Data

### Daily Calibration Data Overview

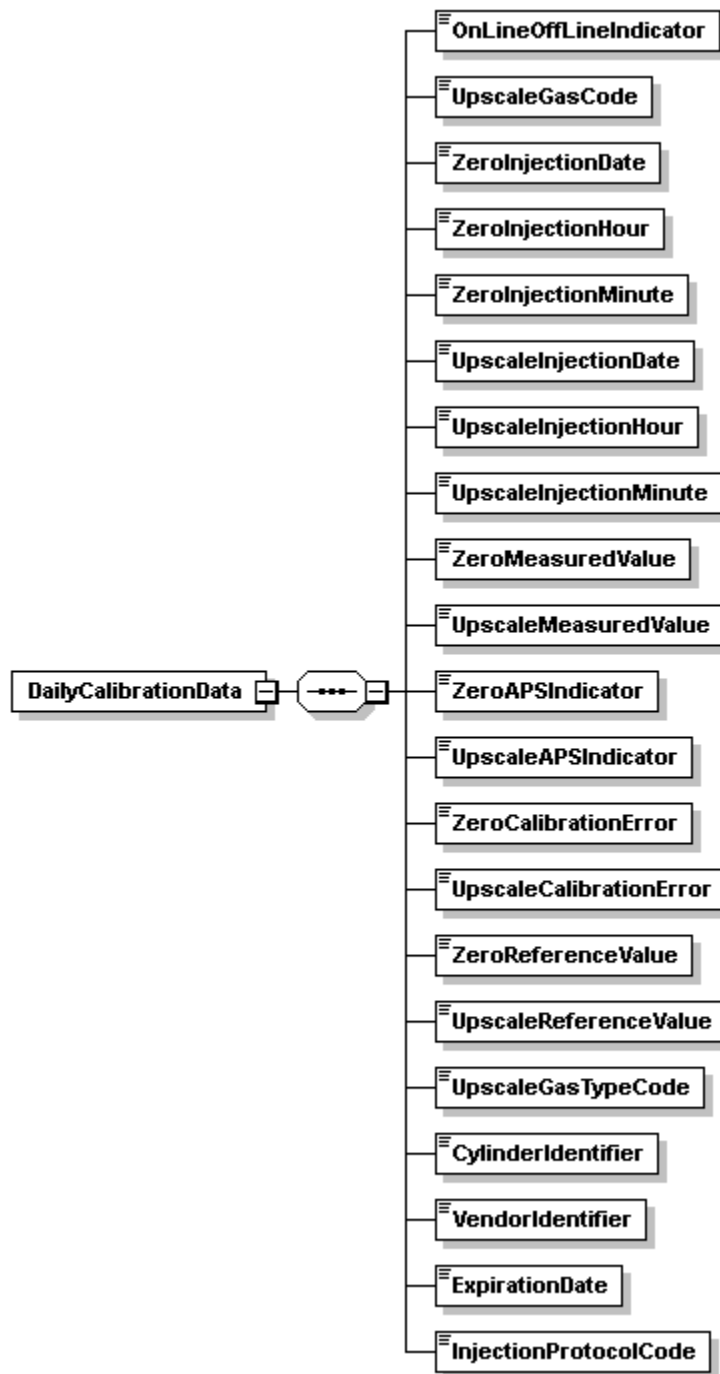
The DAILY CALIBRATION DATA record is used to report the details of each daily calibration error test sequence completed. You must report a DAILY CALIBRATION DATA record for each calibration error test performed that affects data validation. A complete DAILY CALIBRATION DATA record should contain data for both the zero and upscale calibration point.

Partial calibration error tests (where the tested level passes the applicable specification) do not satisfy the daily calibration error requirements and are not required to be reported since they have no effect on data validation. If such calibrations are included in the emissions report, then report the result as “INC” in the DAILY TEST SUMMARY DATA record. Partial calibration error tests where the tested level fails to meet the applicable specification must be reported as an “ABORTED” test. You are not required to report additional failed calibration tests for a component when the data from that component is already considered invalid due to a previously failed calibration error test. However, please note that tests reported as “FAILED” should be reported with all the necessary fields completed. Daily calibration error tests conducted with expired gas cylinders, gas cylinders obtained from a vendor not participating in the PGVP program, or gas cylinders containing concentrations outside the required percentage of the Monitoring SPAN VALUE record are considered invalid and should not be reported.

For more information concerning this record regarding moisture monitoring systems, flow monitors, maintenance procedures, or dual range analyzers, see the “Specific Considerations” section below.

Daily Calibration Data XML Model

Figure 5: Daily Calibration Data XML Elements



Daily Calibration Data XML Elements

**OnLine OffLine Indicator** (*OnLineOffLineIndicator*)

Indicate whether this daily calibration was performed online (report “1”) or offline (report “0”). For Hg and HCl CEMS, all calibrations prior to September 9, 2020 must be done online. On and after September 9, 2020 Hg daily calibrations may be performed offline.

**Upscale Gas Code** (*UpscaleGasCode*)

Indicate whether the gas used for the upscale injection is high-level or mid-level by reporting the appropriate code (HIGH or MID). Mid-level gas injections may be performed and reported in lieu of the high-level injections, provided that the mid-level (MID) gas is more representative of the actual stack emissions. If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

**Zero Injection Date** (*ZeroInjectionDate*)

Report the date of the completion of the zero gas injection. If the daily calibration was not completed and there was no zero-level injection, leave this field blank.

**Zero Injection Hour** (*ZeroInjectionHour*)

Report the hour of the completion of the zero gas injection. If the daily calibration was not completed and there was no zero-level injection, leave this field blank.

**Zero Injection Minute** (*ZeroInjectionMinute*)

Report the minute of the completion of the zero gas injection. If the daily calibration was not completed and there was no zero-level injection, leave this field blank.

**Upscale Injection Date** (*UpscaleInjectionDate*)

Report the date of the completion of the upscale gas injection. If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

**Upscale Injection Hour** (*UpscaleInjectionHour*)

Report the hour of the completion of the gas injection. If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

**Upscale Injection Minute** (*UpscaleInjectionMinute*)

Report the minute of the completion of the upscale gas injection. If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

**Zero Measured Value** (*ZeroMeasuredValue*)

Report the value measured by the instrument in response to the reference following the gas injection or reference signal. Report this value in calibration span units of measure. For all monitors except flow, the units (and decimal precision) should match the hourly reporting. For example, for SO<sub>2</sub>, report concentration in ppm and round the resulting value to the appropriate number of decimal places in Table 4. For flow, use the calibration units of measure defined in the Monitoring SPAN VALUE record and round the resulting value to the appropriate number of decimal places per Table 4.

If the daily calibration was not completed and there was no zero-level injection, leave this field blank.

**Upscale Measured Value** (*UpscaleMeasuredValue*)

Report the value measured by the instrument in response to the reference following the gas injection or reference signal. Report this value in calibration span units of measure. For all monitors except flow, the units (and decimal precision) should match the hourly reporting. For example, for SO<sub>2</sub>, report concentration in ppm and round the resulting value to the appropriate

number of decimal places per Table 4. For flow, use the calibration units of measure defined in the Monitoring SPAN VALUE record and round the resulting value to the appropriate number of decimal places per Table 4.

If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

**Zero APS Indicator** (*ZeroAPSIndicator*)

If the zero injection result is determined using a standard calibration error (CE) specification, report “0.” If the alternative performance specification is used, report “1,” as allowed under Part 75 or (for Hg and HCl) under 40 CFR Part 63, Subpart UUUUU. If the daily calibration is not completed and there was no zero level injection, leave this field blank.

**Upscale APS Indicator** (*UpscaleAPSIndicator*)

If the upscale injection result is determined using a standard CE specification, report “0.” If the alternative performance specification is used, report “1,” as allowed under Part 75 or (for Hg and HCl) under 40 CFR Part 63, Subpart UUUUU. If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

**Zero Calibration Error** (*ZeroCalibrationError*)

Report the calibration error results of the zero-level injection, as required by Part 75 or (for Hg and HCl) according to 40 CFR Part 63, Subpart UUUUU (see the UpscaleCalibrationError element description for further instructions). If the daily calibration was not completed and there was no zero-level injection, leave this field blank.

**Upscale Calibration Error** (*UpscaleCalibrationError*)

Report the calibration error results of the upscale injection, as required by Part 75 or (for Hg and HCl) according to 40 CFR Part 63, Subpart UUUUU. For SO<sub>2</sub>, Hg, NO<sub>x</sub>, and flow monitors, express the results either as a percentage of the span value or (for low-emitters of SO<sub>2</sub>, Hg, or NO<sub>x</sub>, or for low-span differential pressure-type flow monitors) as the absolute value of the difference between the reference and measured values (i.e., |R - A|). For CO<sub>2</sub> and O<sub>2</sub> monitors, the results are always determined using |R - A| and are expressed in terms of absolute percent CO<sub>2</sub> or O<sub>2</sub>. Use this method for all diluent gas monitors used for CO<sub>2</sub> reporting and/or NO<sub>x</sub> reporting and/or MATS reporting. For all parameters, except for low-span differential pressure-type flow monitors using the alternative specification, report the calibration error (or |R - A|) to one decimal place. When a low-span differential pressure-type flow monitor uses the alternative specification because the standard specification was not met, the |R - A| value must be reported to two decimal places. If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

If the calculated calibration error meets the standard performance specification, report the result as a percentage of the span value even though the result would also pass the alternative specification. Only when the result does not pass the standard specification, but meets the alternative specification, should |R - A| be reported. If the test does not pass either specification, report the calibration error as a percentage of the span value.

**Zero Reference Value** (*ZeroReferenceValue*)

Report the calibration gas or reference signal value used in this injection. Report the certified value of the reference calibration gas, in ppm for SO<sub>2</sub>, HCl, and NO<sub>x</sub>, in µg/scm for Hg, or in

%CO<sub>2</sub> or %O<sub>2</sub> for CO<sub>2</sub> and O<sub>2</sub>. Report the value of the reference signal in the appropriate units, for flow monitors. Report the value to the precision defined in Table 4. If the daily calibration was not completed and there was no zero-level injection, leave this field blank.

**Upscale Reference Value** (*UpscaleReferenceValue*)

Report the calibration gas or reference signal value used in this injection. Report the certified value of the reference calibration gas, in ppm for SO<sub>2</sub>, HCl, and NO<sub>x</sub>, in µg/scm for Hg, or in %CO<sub>2</sub> or %O<sub>2</sub> for CO<sub>2</sub> and O<sub>2</sub>. Report the value of the reference signal in the appropriate units for flow monitors. Report the value to the precision defined in Table 4. If the daily calibration was not completed and there was no upscale-level injection, leave this field blank.

**Table 4: Precision of Reported Values for Daily Calibration Data**

Parameter Codes	Required Precision
CO2, H2O, NOX, O2, SO2, HG, HCL	One Decimal Place
FLOW	Same as Calibration Span Value

**Upscale Gas Type Code** (*UpscaleGasTypeCode*)

For SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, and O<sub>2</sub> components, report one or more of the gas type codes in Table 5 to indicate the type of gas in the cylinder used for the upscale injection. Note: If you use a component that is not present in this table, you may report a value of “APPVD,” but you will need to contact EPA before submitting the data in order to get permission to use this code. Leave this field blank if the Component Type Code is FLOW, HG, HCl or H<sub>2</sub>O.

**Table 5: PGVP Gas Type Codes and Descriptions**

Code	Description
SO2	EPA Protocol Certified Gas Component SO <sub>2</sub>
NO	EPA Protocol Certified Gas Component NO
NO2	EPA Protocol Certified Gas Component NO <sub>2</sub>
NOX	EPA Protocol Certified Gas Component Total Oxides of Nitrogen
N2O	EPA Protocol Certified Gas Component Nitrous Oxide
CO2	EPA Protocol Certified Gas Component CO <sub>2</sub>
CO	EPA Protocol Certified Gas Component CO
O2	EPA Protocol Certified Gas Component O <sub>2</sub>
PPN	EPA Protocol Certified Gas Component Propane
CH4	EPA Protocol Certified Gas Component Methane
HE	EPA Protocol Certified Gas Component Helium
H2S	EPA Protocol Certified Gas Component Hydrogen Sulfide
BALA	Balance Gas is Air
BALN	Balance Gas is Nitrogen

Code	Description
APPVD	Other EPA-approved EPA Protocol gas blend (see note below). Do not report certified components when using this code.
AIR	Zero Air Material (instrument air with no cylinder and meeting the requirements of paragraphs (2) or (3) of the ZAM definition in § 72.2). This code is reported only when it is used as a high-level O <sub>2</sub> gas for an oxygen analyzer. Do not report AIR when used to zero an analyzer. Do not report certified components when using this code.
SRM	Standard reference material. Do not report certified components when using this code.
NTRM	NIST-traceable reference material. Do not report certified components when using this code.
GMIS	Gas manufacturer's intermediate standard. Do not report certified components when using this code.
RGM	Research gas mixture. Do not report certified components when using this code.
PRM	SRM-equivalent compressed gas primary reference material. Do not report certified components when using this code.
ZERO	Zero gas (meeting the definition of "Zero Air Material" in §72.2) used for the low level calibration of a reference analyzer used in RATA testing. Do not report certified components when using this code.

Note: If you use a gas component or material that is not present in this table, you may report a value of "APPVD," but you will need to contact your EPA/CAMD/EMB analyst before submitting the data in order to get permission to use this code.

### **Cylinder Identifier** (*CylinderIdentifier*)

For SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, and O<sub>2</sub> components, report the vendor-assigned identification or serial number found on the cylinder used for the upscale injection. Use only capitalized alphanumeric characters, hyphens, periods, and ampersands. In order to import a file with an ampersand successfully, the ampersand will need to be escaped within the XML. For example, to report the Cylinder ID <AB01234567&>, the XML would read <AB01234567&amp;>. Leave this field blank if the Component Type Code is FLOW, HCL, HG, or H<sub>2</sub>O.

### **Vendor Identifier** (*VendorIdentifier*)

For an EPA Protocol gas, report the EPA-assigned PGVP Vendor ID of the production site that supplied the cylinder used for the upscale injection. PGVP Vendor IDs are year specific, therefore report the assigned PGVP Vendor ID that is applicable on the date the cylinder is certified. An up-to-date list of PGVP Vendor IDs will be located on the EPA website, and can be accessed via the ECMPS Support website. Leave this field blank if the Component Type Code is FLOW, HCL, HG, or H<sub>2</sub>O or if the Gas Type Code is AIR, SRM, NTRM, GMIS, RGM, or PRM.

### **Expiration Date** (*ExpirationDate*)

For an EPA Protocol gas, SRM, NTRM, GMIS, RGM, or PRM, report the expiration date of the cylinder used for the upscale injection. Leave this field blank if the Component Type Code is FLOW, HCL, HG, or H<sub>2</sub>O or if the Gas Type Code is AIR.

### **Injection Protocol Code** (*InjectionProtocolCode*)

Report this code to indicate the use of either elemental or oxidized NIST-traceable Hg standards.



**Table 6: Injection Protocol Codes and Descriptions**

Code	Description
HGE	<i>NIST-Traceable Elemental Hg Standards</i> as defined in Section 3.1.4, Part 63, Subpart UUUUU, Appendix A.
HGO	<i>NIST-Traceable Source of Oxidized Hg</i> as defined in Section 3.1.5, Part 63, Subpart UUUUU, Appendix A.

### Specific Considerations

#### **Maintenance Procedures**

During maintenance procedures, the calibration gas injections used during those procedures do not have to be reported if the results of the calibration gas injection do not indicate that the control status of the monitor has changed. For instance, if a monitoring system is already out-of-control and calibration gases are injected as part of the maintenance procedures, the results of these injections do not have to be reported. Only the results of the post-maintenance calibration error test which is used to validate the subsequent emissions data must be reported. Similarly, if as part of a maintenance procedure on one monitor, calibration gases must be injected into other monitors, the results of these injections do not have to be reported as long as they are within the calibration error specification. If the results of these injections indicate that any monitoring system is out-of-control, these injections must be reported and considered to be a failed calibration error test.

#### **Components Belonging to Multiple Systems**

If a component is part of two (or more) systems (for example, a CO<sub>2</sub> analyzer used both as a primary CO<sub>2</sub> monitor and as a diluent monitor in a NO<sub>x</sub>-diluent monitoring system) the calibration error test should only be reported once, using the component ID. Data validation for each monitoring system of which the component is part will be determined based on this single test record.

#### **Moisture Monitoring Systems**

For moisture monitoring systems consisting of wet- and dry-basis O<sub>2</sub> monitors, report two calibrations only if the wet and dry readings are obtained from two different analyzers. Report only the dry-basis O<sub>2</sub> calibration when a single analyzer is used for both wet and dry oxygen.

#### **Flow Monitoring Systems**

For flow monitoring systems comprised of two flow components, perform and report a daily calibration for each flow component in the system.

#### **Dual Range Monitors**

For dual range monitors, perform and report daily calibrations for the instrument range(s) used during the day.

#### **Provisions for Conducting Daily Calibration**

Conduct the daily calibration according to the requirements of 40 CFR Part 75, Appendices A and B or (if applicable) 40 CFR Part 63, Subpart UUUUU. Daily calibrations validate the acceptability of emissions data from each monitoring component.

## 2.3 Weekly Test Summary Data

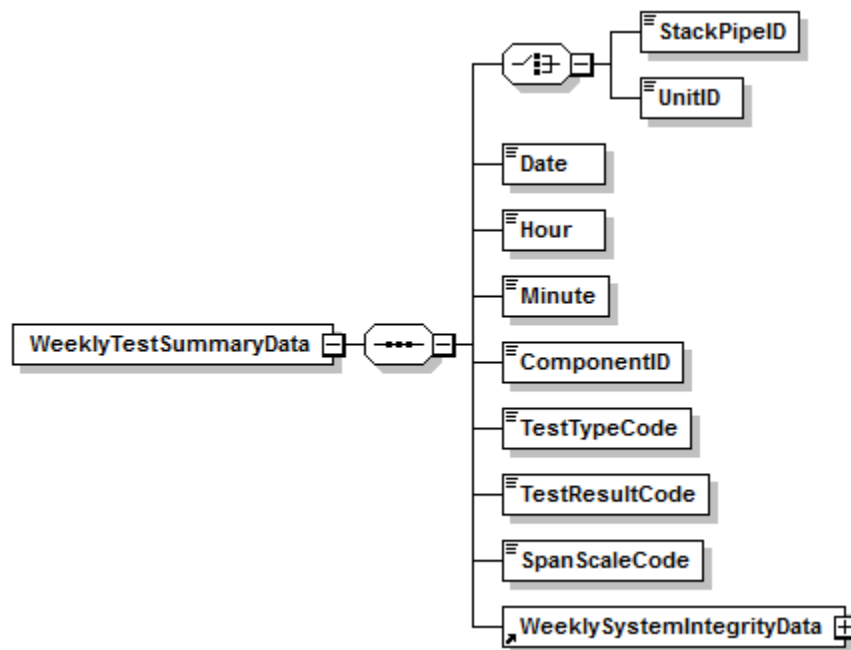
### Weekly Test Summary Data Overview

The WEEKLY TEST SUMMARY DATA record summarizes the completion date and time, and the results (Passed/Failed) for each weekly system integrity check. For each single-point system integrity check, report the test data in the WEEKLY SYSTEM INTEGRITY DATA record. (See instructions for that record below.)

Report the results of all failed and passed weekly system integrity checks that affect data validation. You are not required to report additional failed single-point system integrity test data for a component when the data from that component are already considered invalid due to a previously failed test. However, please note that tests reported as “FAILED” should be reported with all the necessary fields completed.

### Weekly Test Summary Data XML Model

**Figure 6: Weekly Test Summary Data XML Elements**



### Weekly Test Summary Data XML Elements

**Unit ID or Stack Pipe ID** (*UnitID or StackPipeID*)

Report either the Unit ID or Stack Pipe ID for the daily test location. This is the alphanumeric code assigned by a source to identify a unit or stack.

**Date** (*Date*)

Report the date corresponding to the completion of the test.

**Hour** (*Hour*)

Report the hour corresponding to the completion of the test.

**Minute** (*Minute*)

Report the minute corresponding to the completion of the test.

**Component ID** (*ComponentID*)

Report the three character ID assigned to the component.

**Test Type Code** (*TestTypeCode*)

Report the test type code as HGS11 to indicate a Single-Point System Integrity Check.

**Test Result Code** (*TestResultCode*)

Report the test result code as PASSED, PASSAPS, or FAILED. See detailed descriptions of each code in Table 7, below. The applicable performance specifications for this test are found in Table A-2 of Appendix A to 40 CFR Part 63, Subpart UUUUU.

**Table 7: Test Result Code Descriptions for Weekly System Integrity Checks**

<b>Code</b>	<b>Description</b>
PASSED	Report this code whenever the standard performance specification in Table A-2 of Appendix A to 40 CFR Part 63, Subpart UUUUU is met.
PASSAPS	Report this code whenever the standard performance specification is not met but the alternative performance specification in Table A-2 is met.
FAILED	Report this code whenever the system integrity error (SIE) fails to meet either the standard or alternative performance specification. Data for the monitoring system will be considered invalid until a subsequent retest is passed.

**Span Scale Code** (*SpanScaleCode*)

Report a span scale code of "H."

## 2.3.1 Weekly System Integrity Data

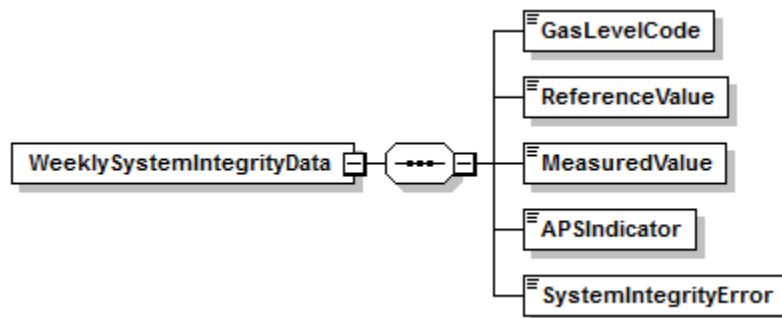
### Weekly System Integrity Data Overview

The WEEKLY SYSTEM INTEGRITY DATA record is used to report the details of each single-point system integrity check performed for Hg CEMS that conduct daily calibration error tests using an elemental Hg standard.

For more information concerning this record see the “Specific Considerations” section below.

### Weekly System Integrity Data XML Model

**Figure 7: Weekly System Integrity Data XML Elements**



### Weekly System Integrity Data XML Elements

#### **Gas Level Code** *GasLevelCode*

Indicate whether the standard used is a high- or mid-level NIST-traceable source of oxidized Hg by reporting the appropriate code (HIGH or MID). Calibration standard injections should be performed at the level which is most representative of the actual stack emissions.

#### **Reference Value** *ReferenceValue*

Report the value of the calibration standard used for the injection. Report the reference value, in  $\mu\text{g}/\text{scm}$ , rounded to one decimal place.

#### **Measured Value** *MeasuredValue*

Report the value measured by the instrument ( $\mu\text{g}/\text{scm}$ ) in response to the reference following the calibration standard injection. Report this value in  $\mu\text{g}/\text{scm}$  rounded to one decimal place.

#### **APS Indicator** *APSIndicator*

If the system integrity error (SIE) is determined using the standard performance specification, report “0.” If the alternative performance specification (APS) is used to pass the test, report “1.”

#### **System Integrity Error** *SystemIntegrityError*

Calculate and report the results of the single-point system integrity check as a percentage of the reference gas value or, if necessary, as the absolute value of the difference between the reference and measured values (i.e.,  $|R - A|$ ).

If the calculated system integrity error meets the standard performance specification, report the result as a percentage of the reference gas value, even though the result would also pass the alternative specification. Only when the result does not pass the standard specification, but meets the alternative specification, should  $|R - A|$  be reported. If the system integrity check fails both specifications, report the SIE as a percentage of the reference gas value.

### **Specific Considerations**

The “weekly” single-point system integrity check must be performed at least once every 7 operating days (see section 5.1.2.3 of Appendix A to 40 CFR Part 63, Subpart UUUUU). The test must be done while the unit is combusting fuel. A mid-level or high-level NIST-traceable source of oxidized Hg must be used. The test consists of a single high- or mid-level injection. There is no grace period for this test.

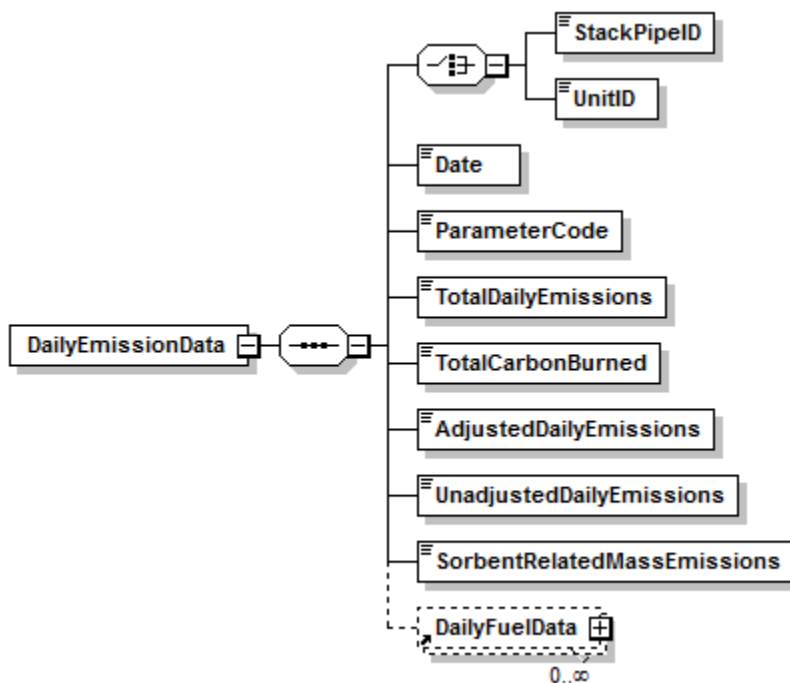
## 2.4 Daily Emissions Data

### Daily Emissions Data Overview

Submit DAILY EMISSION DATA records to report daily CO<sub>2</sub> mass determined using Appendix G Fuel Sampling and Analysis (FSA) and Equation G-1. Note that this CO<sub>2</sub> value is the total mass emissions for the day, not a daily rate.

### Daily Emissions Data XML Model

Figure 8: Daily Emission Data XML Elements



### Daily Emissions Data XML Elements

**Unit ID or Stack Pipe ID** (*UnitID or StackPipeID*)

Report either the Unit ID or Stack Pipe ID for the daily emissions location. This is the alphanumeric code assigned by a source to identify a unit or pipe.

**Date** (*Date*)

Report the date corresponding to the daily emissions.

**Parameter Code** (*ParameterCode*)

Report the parameter code for daily emissions monitoring as CO<sub>2</sub>M.

**Total Daily Emissions** (*TotalDailyEmissions*)

Report the total CO<sub>2</sub> mass emissions for the day in tons. Round to one decimal place.

**Total Carbon Burned** (*TotalCarbonBurned*)

Report the total amount of carbon burned (in lbs) during the day.

**Adjusted Daily Emissions** (*AdjustedDailyEmissions*)

This field applies only to coal-fired units and is optional. Report the adjusted value, in tons, if adjusting the CO<sub>2</sub> mass emissions for carbon content of the fly ash. Round to one decimal place.

Leave this field blank if electing not to make an adjustment for the carbon content of the fly ash.

**Unadjusted Daily Emissions** (*UnadjustedDailyEmissions*)

Report the unadjusted daily emissions value determined using the G-1 equation.

**Sorbent Related Mass Emissions** (*SorbentRelatedMassEmissions*)

This field is only for units with add-on SO<sub>2</sub> emission controls. Report data in this field in tons. Round to one decimal place.

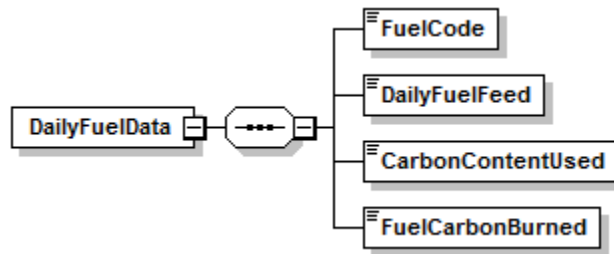
## 2.4.1 Daily Fuel Data

### Daily Fuel Data Overview

Submit DAILY FUEL DATA records to report fuel-specific data used when using Appendix G Fuel Sampling and Analysis (FSA) and Equation G-1 to determine daily CO<sub>2</sub> mass if required to do so on behalf of the RGGI program.

### Daily Fuel Data XML Model

Figure 9: Daily Fuel Data XML Elements



### Daily Fuel Data XML Elements

#### **Fuel Code** (*FuelCode*)

Report the fuel code of a specific fuel used during the day.

#### **Daily Fuel Feed** (*DailyFuelFeed*)

Report the feed rate of a specific fuel (in lbs) used during the day.

#### **CarbonContent Used** (*CarbonContentUsed*)

Report the amount of carbon burned as a percentage of the daily feed rate for a specific fuel.

#### **Fuel Carbon Burned** (*FuelCarbonBurned*)

Report the amount of carbon burned (in lbs) during the day for a specific fuel.



## 2.5 Hourly Operating Data

### Hourly Operating Data Overview

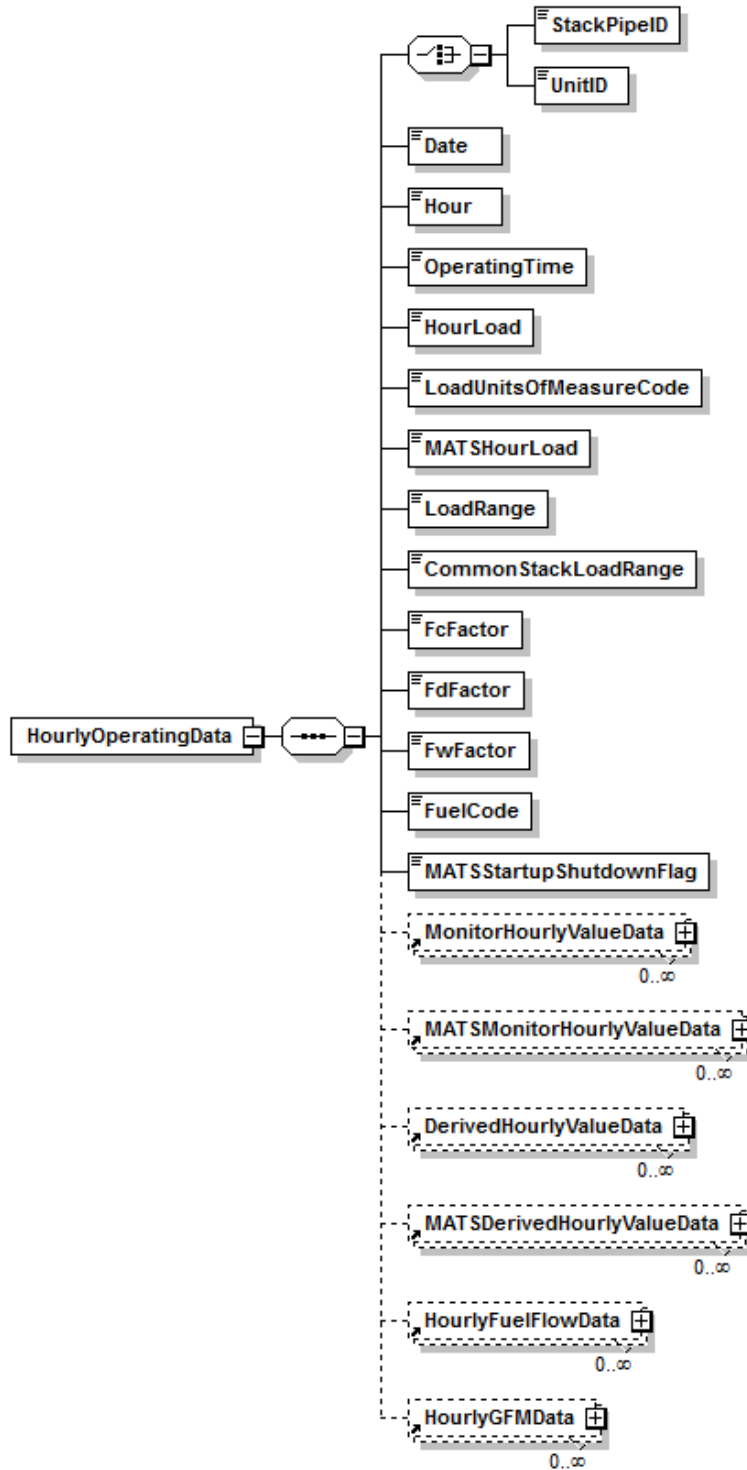
Report an HOURLY OPERATING DATA record for every clock hour of the reporting period for every unit, stack, and pipe in the monitoring configuration represented by this emissions file. (You must report these records even for non-operating quarters.) Report an HOURLY OPERATING DATA record for every clock hour, as follows: (a) for each affected unit, irrespective of the location(s) at which the emissions are measured; and (b) for each common stack (or pipe) or multiple stack (or pipe) location at which emissions are measured.

For example, if common stack CS1 serves Units 1 and 2 and emissions are monitored at the common stack, report HOURLY OPERATING DATA for the common stack and also report HOURLY OPERATING DATA for each unit. As a second example, if Unit 1 discharges through two stacks, MS1 and MS2, and emissions are monitored at each stack, report separate HOURLY OPERATING DATA for each stack and also report HOURLY OPERATING DATA for Unit 1.

If a common stack serves Units 1, 2, and 3, but Unit 1 did not operate during the quarter, report HOURLY OPERATING DATA for every clock hour in the quarter for Unit 1 with 0.00 as the operating time and leave the remaining fields blank. The HOURLY OPERATING DATA records for Units 2 and 3 will contain the appropriate operating data

Hourly Operating Data XML Model

**Figure 10: Hourly Operating Data XML Elements**



### Hourly Operating Data XML Elements

#### **Unit ID or Stack Pipe ID** (*UnitID or StackPipeID*)

Report either the Unit ID or Stack Pipe ID for the HOURLY OPERATING DATA. This is the alphanumeric code assigned by a source to identify a unit, stack, or pipe.

#### **Date** (*Date*)

Report the date corresponding to the data being reported.

#### **Hour** (*Hour*)

Report the hour corresponding to the data being reported.

#### **Operating Time** (*OperatingTime*)

Report the fraction of the clock hour during which the unit combusted any fuel (or the fraction of the clock hour during which the stack or pipe was used). You may use any equal increments from hundredths (0.01 hr) to quarters (0.25 hr) of an hour.

If the unit, stack, or pipe did not operate, report “0.00.” For common stack and multiple stack configurations, report an operating time of “0.00” in the HOURLY OPERATING DATA record for any clock hour in which none of the units that exhaust through a particular stack are operating or for any clock hour in which the dampers are closed so that flue gas is unable to pass through the stack.

If you elect to use a multiple-stack configuration to report NO<sub>x</sub> emissions data from a combined-cycle combustion turbine that: (a) uses Appendix D to measure the unit-level heat input; and (b) has a NO<sub>x</sub>-diluent monitoring system installed on each stack (i.e., on the main stack and the bypass stack), report the stack operating times as follows:

- For any hour in which all of the exhaust gases flow through one stack or the other, the operating time for the stack that is in use will be equal to the unit operating time for that hour, and the operating time for the other stack will be 0.00; and
- For a transition hour, in which gases flow through both stacks during the entire hour or any part of the hour:
  - Report that fraction of the hour (if any) in which gases flow only through the main stack as the “main stack operating time;” and
  - Report the remainder of the hour in which gases either flow through both stacks simultaneously or flow only through the bypass stack as the “bypass stack operating time.”

#### Operating Time for LME Units

Report the fraction of the clock hour during which the unit combusted any fuel (or the fraction of the clock hour during which the stack or pipe was used).

Report a unit operating time of “0.00” for any clock hour in which the unit did not operate.

#### **Hour Load** (*HourLoad*)

For Part 75 reporting report hourly load information as either steam load or gross unit load.

The units for average hourly gross unit load are to be reported in megawatts of electrical generation or in either 1,000 lbs/hr or mmBtu/hr of steam generation. Note that this value represents an hourly rate and not the total load for the hour. Do not correct steam load for standard temperature and pressure; use steam load at measured temperature and pressure (see Part 75, Appendix C, Section 2.2.1).

If you convert auxiliary heat input to the megawatts equivalent (e.g., for a heat recovery steam generator with a duct burner) and add that value to megawatts for a gas turbine, you should report the unit electric load in megawatts.

For multiple-stack configurations, with one exception, for each unit operating hour in which gases flow through a particular stack or duct, report the unit load in both the stack-level and unit-level HOURLY OPERATING DATA records for that hour. The lone exception is when the unit is also subject to MATS and is required to report electrical load for compliance with an electrical output-based standard. In that case, report the unit- and stack-level loads as described in the MATSHourLoad data field.

For monitored common stacks, report the weighted sum of the hourly unit loads for all units that exhaust through the stack, according to the following formula:

$$\text{Weighted Load} = \frac{\sum (\text{Load}_u \times \text{OpTime}_u)}{\text{OpTime}_{cs}}$$

Leave this element blank (do not report zeros) for any clock hour in which the unit, stack, or pipe did not operate. Also leave this element blank for units that do not produce electrical or steam load (e.g., cement kilns, refinery process heaters, etc.).

**Load Units of Measure Code** (*LoadUnitsOfMeasureCode*)

Report the appropriate code to identify the load units of measure.

If you report steam load (klb/hr) or thermal output (mmBtu/hr) for Part 75 purposes, report the appropriate code for steam load or mmBtu/hr in this data element and in the MONITORING LOAD DATA record of your monitoring plan even if you also report electrical load (megawatts) for MATS Rule compliance in the MATSHourLoad data element below.

**Table 8: Load Units of Measure Codes and Descriptions**

Code	Description
MW	Electrical Load in Megawatts
KLBHR	Steam Load in Thousands of Pounds per Hour
MMBTUHR	Thermal Output in mmBtu per Hour

Leave this element blank for any clock hour in which the unit, stack, or pipe did not operate. Also leave this element blank for units that do not produce electrical or steam load (e.g., cement kilns, refinery process heaters, etc.).

**MATS Hour Load** (*MATSHourLoad*)

If you are required to report electrical load to comply with the MATS rule (i.e., to demonstrate compliance with an electrical output-based standard), you must report the hourly electrical load (megawatts) in this data field (see 40 CFR Part 63, Subpart UUUUU, Appendix A, section 7.1.2.3 and Appendix B, section 10.1.2.3).

For cogeneration units, the MATS Hour Load represents the “gross output” as defined in §63.10042 of Subpart UUUUU.

For single unit-single stack exhaust configurations, report the hourly unit load.

For monitored common stack configurations, report the combined hourly load for the units that share the stack.

If the unit has a multiple-stack or duct (“MS”) exhaust configuration and:

1. Gases flow through all of the stacks or ducts continuously; and
2. The pollutant concentrations and stack gas flow rates are continuously monitored in all of the stacks or ducts.

Then, for the purposes of MATS compliance:

- Report the unit load in the unit-level HOURLY OPERATING DATA record for each operating hour;
- Report a flow rate-apportioned load value in this data field for each of the stack-level HOURLY OPERATING DATA records for each operating hour. Apportion the unit load to each stack or duct using formula MS-2.

If the stack gas flow rate for any of the multiple stacks or ducts is missing or invalid for any operating hour, report MODC “38” in each of the stack-level MATSDERIVEDHOURLYVALUE records to indicate that the apportioned stack loads could not be determined and that the pollutant emission rate for the unit could not be calculated for this hour.

**Load Range** (*LoadRange*)

Report an operating load range (load bin number) for each operating hour (see Appendix C to Part 75) for units that produce electrical or steam load and that use load-based missing data substitution for one or more monitored parameters. Monitored parameters that require load-based missing data substitution include NO<sub>x</sub> emission rate, NO<sub>x</sub> concentration (for NO<sub>x</sub>C systems, only), stack gas flow rate, and fuel flow rate.

For units that do not produce electrical or steam load (e.g., cement kilns, refinery process heaters, etc.), report the operational bin number, if operational bins are used for missing data purposes. If the operational bin number is indeterminable, report “0.”

For a monitored common stack, the load bins are defined at the common stack on the basis of combined unit load, and load-based missing data routines are applied at the common stack. Report the common stack load bin number in the common stack HOURLY OPERATING DATA record. If parameters that require load-based missing data substitution are also monitored at the unit, report the load bin number for the unit in the unit level HOURLY OPERATING DATA record.

For a multiple-stack configuration in which gases normally flow through both stacks or ducts simultaneously (e.g., a twin-stack or split-breeching configuration), report the load bin number for the monitored location within the configuration. For example, if Unit 1 discharges through two stacks, MS1FGD and MS1BYP, and emissions are monitored only at MS1FGD, only report the MS1FGD load bin number in the stack-level HOURLY OPERATING DATA record.

For load-based units, leave this element blank (do not report zeros) for any clock hour in which the unit does not operate or gases do not flow through the stack (as applicable). Also leave this element blank for non load-based units that do not use operational bins for missing data purposes and for LME units.

#### **Common Stack Load Range** (*CommonStackLoadRange*)

For a common stack with installed stack flow monitor, if you have elected to establish 20 load bins for missing data substitution purposes, report the appropriate load bin number using this element. Note that this is an optional alternative to the standard load range.

#### **Fc Factor** (*FcFactor*)

If any emissions calculations at this location require use of the carbon-based F-factor, report the appropriate Fc-factor value corresponding to the fuel(s) burned during the hour.

#### **Fd Factor** (*FdFactor*)

If any emissions calculations at this location require use of the dry-basis F-factor, report the appropriate Fd-factor value corresponding to the fuel(s) burned during the hour.

#### **Fw Factor** (*FwFactor*)

If any emissions calculations at this location require use of the wet-basis F-factor, report the appropriate Fw-factor value corresponding to fuel(s) burned during the hour.

#### **Fuel Code** (*FuelCode*)

You must report data in this field if: (1) you have elected to use the fuel-specific continuous emissions monitoring system (CEMS) missing data option under §75.33; or (2) you have an exhaust configuration consisting of a monitored main stack and an unmonitored bypass stack, and you opt to report the fuel-specific Maximum Potential Concentration (MPC) or maximum potential NO<sub>x</sub> emission rate (MER) value during bypass hours (see §§75.16, 75.17 and 75.72). Otherwise, reporting data in this field is optional. Select one Fuel Code shown in Table 9. This field does not apply to MATS reporting.

**Table 9: Fuel Codes and Descriptions**

<b>Code</b>	<b>Description</b>
MIX	Use this code for any hour in which fuels are co-fired
BFG	Blast Furnace Gas
BUT	Butane (if measured as a gas)
C	Coal
CDG	Coal-Derived Gas
COG	Coke Oven Gas
CRF	Coal Refuse (culm or gob)

Code	Description
DGG	Digester Gas
DSL	Diesel Oil
LFG	Landfill Gas
LPG	Liquefied Petroleum Gas (as defined in §72.2)
NNG	Natural Gas
OGS	Other Gas
OIL	Residual Oil
OOL	Other Oil
OSF	Other Solid Fuel
PDG	Producer Gas
PNG	Pipeline Natural Gas (as defined in §72.2)
PRG	Process Gas
PRP	Propane (if measured as a gas)
PRS	Process Sludge
PTC	Petroleum Coke
R	Refuse
RFG	Refinery Gas
SRG	Unrefined Sour Gas
TDF	Tire-Derived Fuel
W	Wood
WL	Waste Liquid

**MATS Startup Shutdown Flag** (*MATSSStartupShutdownFlag*)

Report this flag in order to identify an hour as a MATS Startup or MATS Shutdown hour. Report a flag of “U” to indicate a Startup hour or “D” to indicate a Shutdown hour. The field should be left null if the location is not a MATS affected source or it is not a MATS Startup or MATS Shutdown hour.

## 2.5.1 Monitor Hourly Value Data

### Monitor Hourly Value Data Overview

Use the MONITOR HOURLY VALUE DATA (MHV) record to report each value measured by a continuous emission monitoring system (CEMS), or stack gas flow rate monitoring system. The monitored parameters may include SO<sub>2</sub> concentration, NO<sub>x</sub> concentration, CO<sub>2</sub> concentration, O<sub>2</sub> concentration, H<sub>2</sub>O concentration (moisture), and volumetric flow. Use this record also to report the appropriate missing data substitution values (except for parameters that do not have substitute data requirements). These instructions contain a subsection for each measured parameter, to give specific direction on how to report for that parameter.

#### **SO<sub>2</sub> Concentration**

If you use continuous emissions monitoring systems (CEMS) to determine SO<sub>2</sub> mass emissions or SO<sub>2</sub> emissions rate for MATS, report SO<sub>2</sub> concentration in an MHV record for each hour or partial hour of unit operation, with one exception: do not report an MHV record for hours in which only gaseous fuel is combusted, if you account for SO<sub>2</sub> mass emissions during those hours using the provisions of §75.11(e)(1) in lieu of operating and recording data from the SO<sub>2</sub> monitoring system.

#### **Volumetric Flow**

If you use stack flow monitoring to determine hourly heat input rate or SO<sub>2</sub>, CO<sub>2</sub>, or NO<sub>x</sub> mass emissions, report volumetric flow in an MHV record for each operating hour or partial operating hour.

Table 10, below, summarizes which elements to report for SO<sub>2</sub>C and FLOW MHV records.

**Table 10: MHV Elements for SO<sub>2</sub>C or Flow**

MHV Elements to Report	SO <sub>2</sub> C or Flow	
	Measured Data	Missing Data
Parameter Code	✓	✓
Unadjusted Hourly Value	✓	
Adjusted Hourly Value	✓	✓
Method of Determination Code (MODC)	✓	✓
Monitoring System ID	✓	✓
Component ID	✓	✓
Percent Available	✓	✓
Moisture Basis		

#### **NO<sub>x</sub> Concentration**

If you use a NO<sub>x</sub>-diluent monitoring system to determine and report the NO<sub>x</sub> emission rate and/or a NO<sub>x</sub> concentration monitor in conjunction with Stack Flow to determine NO<sub>x</sub> mass, report an MHV record, as follows, for NO<sub>x</sub>C for each unit or stack operating hour as needed for those determinations.



- a) Monitoring locations with only a NO<sub>x</sub>-diluent monitoring system: Report the NO<sub>x</sub> C MHV record for hours in which a quality-assured NO<sub>x</sub> concentration is available and a quality-assured diluent gas (CO<sub>2</sub> or O<sub>2</sub>) concentration is available. Whenever the NO<sub>x</sub> concentration or diluent concentration is missing for an hour, report a NO<sub>x</sub> concentration MHV record without an unadjusted value and report the appropriate substitute data value for NO<sub>x</sub> emission rate in the DERIVED HOURLY VALUE (DHV) record.

Report an MODC of 46 in the MHV records for NO<sub>x</sub> C if a) quality-assured NO<sub>x</sub> C is not available for the hour, b) quality-assured diluent concentration is not available for the hour, or c) both a and b are applicable.

Specific Considerations for locations with both primary and primary bypass NO<sub>x</sub>-diluent monitoring systems:

- When gases flow through both stacks of a combined-cycle turbine with primary and primary bypass NO<sub>x</sub>-diluent monitoring systems designated under a single monitoring location in the same hour, one set of MHV records should be reported for each stack for the hour.
- If both stacks are in control, the stack providing the measured NO<sub>x</sub> emission rate value should report the measured data NO<sub>x</sub> C MHV record as normal. The other stack should report the measured data NO<sub>x</sub> C MHV record and use an MODC of 47 if a) quality-assured NO<sub>x</sub> C is available for the hours, b) quality-assured diluent concentration is available for the hour, and c) these concentration values were not used in determining the hourly NO<sub>x</sub> emission rate.
- If the HRSG stack is in control and the bypass stack is out of control, the NO<sub>x</sub> emission rate will be determined by the greater of the reading from the HRSG stack or MER, or the greater of the reading from the HRSG stack or PB missing data value. If the NO<sub>x</sub> emission rate is quality-assured from the HRSG stack, a standard measured data NO<sub>x</sub> C MHV record should be reported from the HRSG stack and a missing data NO<sub>x</sub> C MHV record using MODC 48 should be reported from the bypass stack. If the NO<sub>x</sub> emission rate is a substitute data value, the HRSG stack should report a measured data NO<sub>x</sub> C MHV record using MODC 47, and a missing data NO<sub>x</sub> C MHV record using MODC 46 should be reported from the bypass stack.
- If the HRSG stack is out of control and the bypass stack is in control, the NO<sub>x</sub> emission rate will be determined by the greater of the readings from the bypass stack or standard unit-level missing data value, or the greater of the readings from the bypass stack or HRSG missing data value. If the NO<sub>x</sub> emission rate is quality-assured from the bypass stack, a standard measured data NO<sub>x</sub> C MHV record should be reported from the bypass stack and a missing data NO<sub>x</sub> C MHV record using MODC 48 should be reported from the HRSG stack. If the NO<sub>x</sub> emission rate is a substitute data value, the bypass stack should report a measured data NO<sub>x</sub> C MHV record using MODC 47, and a missing data NO<sub>x</sub> C MHV record using MODC 46 should be reported from the HRSG stack.
- If both the HRSG and bypass stacks are out of control, the NO<sub>x</sub> emission rate will be a substitute data value. The stack used in determining the NO<sub>x</sub> emission rate should report a missing data NO<sub>x</sub> C MHV record using MODC 46 and the other stack should report a missing data NO<sub>x</sub> C MHV record using MODC 48.

The elements to report for (a) are summarized in Table 11.

**Table 11: MHV Elements for NOXC Record (NOX Rate System Only)**

MHV Elements to Report	NOXC MHV Record	
	Measured Data	Missing Data
Parameter Code	✓	✓
Unadjusted Hourly Value	✓	
Adjusted Hourly Value		
MODC	✓	✓
Monitoring System ID		
Component ID	✓	✓
Percent Available		
Moisture Basis		

- b) Monitoring locations with only a NO<sub>x</sub> concentration monitoring system: Report the NOXC MHV record for every operating hour. If a valid NO<sub>x</sub> concentration is not obtained for the hour, report substitute data in the ADJUSTED HOURLY VALUE element of the record using the applicable missing data procedures for NOXC.
- c) Monitoring locations with both a NO<sub>x</sub>-diluent and a NO<sub>x</sub> concentration monitoring system: Report the NOXC MHV record for every operating hour using the Monitoring System ID for the NO<sub>x</sub> concentration monitoring system. If a valid NO<sub>x</sub> concentration is not obtained for the hour, report the applicable substitute NO<sub>x</sub> concentration data in the MHV record using the applicable missing data procedures for NOXC; and report the appropriate substitute data value for NO<sub>x</sub> emission rate in the DHV record.

The elements to report for (b) and (c) are summarized in Table 12 below.

**Table 12: MHV Elements for NOXC Record (NOXC System)**

MHV Elements to Report	NOXC MHV Record	
	Measured Data	Missing Data
Parameter Code	✓	✓
Unadjusted Hourly Value	✓	
Adjusted Hourly Value	✓	✓
MODC	✓	✓
Monitoring System ID	✓ <sup>1</sup>	✓ <sup>1</sup>
Component ID	✓	✓
Percent Available	✓	✓

MHV Elements to Report	NOXC MHV Record	
	Measured Data	Missing Data
Moisture Basis		

<sup>1</sup> Report the NOXC System ID.

Note that for units with add-on NO<sub>x</sub> emission controls, hours in which the flue gases are discharged through an unmonitored bypass stack are considered to be missing data hours. However, when the outlet NO<sub>x</sub> monitor is unavailable and proper operation of the emission controls is not verified, §75.34 (a)(1) allows you to report data from a certified NO<sub>x</sub> monitor at the control device inlet. If you choose this option, these hours are treated as “available” hours for the purposes of the missing data look backs and percent monitor data availability (PMA) calculations.

For a summary of these requirements, see Table 13 below.

### Reporting of High Range and Full Scale Exceedance Defaults

Treat any hour(s) in which a default high range value (200 percent of Maximum Potential Concentration (MPC)) or a full scale exceedance value (200 percent of range) is used in the calculation of the hourly average NO<sub>x</sub> concentration as follows:

- a) For NO<sub>x</sub> concentration monitoring systems: Treat these hours as quality-assured monitor operating hours and include them in missing data lookback and as available hours for percent monitor data availability calculations.
- b) For NO<sub>x</sub>-diluent monitoring systems:
  1. If a quality-assured diluent value is available for the hour, treat the hour as quality-assured data and use the appropriate NO<sub>x</sub> concentration value in conjunction with the quality-assured average diluent gas concentration for the hour to calculate and report NO<sub>x</sub> emission rate in the DHV record.
  2. If a quality-assured diluent gas concentration is not available for the hour, then consider the NO<sub>x</sub> emission rate data for the hour to be missing and do not report the unadjusted hourly value or adjusted hourly value in the MHV record for the hour. Instead, report the maximum potential NO<sub>x</sub> emission rate (MER) as a substitute data value in a DHV record using an MODC of 25.
- c) Where both NO<sub>x</sub> concentration and NO<sub>x</sub>-diluent monitoring systems are identified:
  1. If a quality-assured diluent value is available for the hour, treat the hour as a quality-assured monitor operating hour and include it in the missing data lookback and as an available hour for percent monitor data availability calculations. Also, use the NO<sub>x</sub> concentration value in conjunction with the quality-assured average diluent gas concentration for the hour to calculate and report NO<sub>x</sub> emission rate in the DHV record.
  2. If a quality-assured diluent gas concentration is not available for the hour, treat the hour as a quality-assured monitor operating hour for NOXC and include it in the missing data lookback for NOXC and as an available hour for percent monitor data availability calculations for the NOXC system. However, the NO<sub>x</sub> emission

rate data for the hour is considered to be missing. Report the MER as a substitute data value in a DHV record using an MODC of 25.

**Table 13: Summary of NO<sub>x</sub> Monitor Hourly Value Record Reporting Requirements**

Use of NO <sub>x</sub> Analyzer	Monitoring System ID Used	Missing Data Instructions
For NO <sub>x</sub> emission rate only or Both NO <sub>x</sub> emission rate and NO <sub>x</sub> mass calculation using NO <sub>x</sub> emission rate x Heat input rate	Blank  (Report the NO <sub>x</sub> -diluent monitoring system ID in the DHV record)	Leave the unadjusted and adjusted hourly values blank in the MHV record for the hour. Perform NO <sub>x</sub> missing data substitution in the DHV record (if NO <sub>x</sub> or diluent concentration is unavailable).
For NO <sub>x</sub> mass calculation using NO <sub>x</sub> concentration x stack flow	NO <sub>x</sub> concentration monitoring System ID	Perform missing data substitution for NO <sub>x</sub> concentration in an MHV record.
Both NO <sub>x</sub> emission rate and NO <sub>x</sub> mass calculation using NO <sub>x</sub> concentration x stack flow	NO <sub>x</sub> concentration monitoring System ID	Perform missing data substitution for NO <sub>x</sub> concentration in an MHV record. Also perform missing data substitution in the DHV record for NO <sub>x</sub> emission rate if either the NO <sub>x</sub> or diluent concentration is missing.

**CO<sub>2</sub> Concentration**

Report a MHV record for CO<sub>2</sub> Concentration only if you use a CO<sub>2</sub> analyzer to determine CO<sub>2</sub> concentration. If you use an O<sub>2</sub> concentration monitor and Equation F-14a or F-14b to determine CO<sub>2</sub> concentration for each hour, report a MHV record for O<sub>2</sub> concentration for the hour (see the instructions for O<sub>2</sub> Concentration below) and report the calculated CO<sub>2</sub> concentration in a DHV record.

If you use a CO<sub>2</sub> analyzer reading to calculate NO<sub>x</sub> emission rate, CO<sub>2</sub> mass emission rate, and/or Heat Input, report a MHV record for CO<sub>2</sub>C for each unit or stack operating hour. If you also use a CO<sub>2</sub> analyzer reading to calculate HCl, HF, Hg, and/or SO<sub>2</sub> emission rates, record a MHV record for CO<sub>2</sub>C for each unit or stack operating hour.

**Table 14: MHV Elements for CO<sub>2</sub>C**

MHV Elements to Report	CO <sub>2</sub> C MHV Records	
	Measured Data	Missing Data <sup>3</sup>
Parameter Code	✓	✓
Unadjusted Hourly Value	✓	✓ <sup>4</sup>
Adjusted Hourly Value		
MODC	✓	✓
Monitoring System ID	1	1
Component ID	✓	✓
Percent Available	2	✓

MHV Elements to Report	CO2C MHV Records	
	Measured Data	Missing Data <sup>3</sup>
Moisture Basis		

<sup>1</sup> If the CO<sub>2</sub> component is part of a CO<sub>2</sub> system, report the CO<sub>2</sub> System ID. Otherwise, leave the System ID blank.

<sup>2</sup> If the CO<sub>2</sub> is used to calculate heat input or CO<sub>2</sub> mass rate, report the Percent Available value for every operating hour.

<sup>3</sup> If the CO<sub>2</sub> value is used to calculate heat input or CO<sub>2</sub> mass rate, report an MHV record for CO2C for every operating hour. Otherwise, do not report CO2C MHV records for missing data hours.

<sup>4</sup> If MODC 46 or 48 is used, do not report the unadjusted hourly value.

- a) Whenever you use a CO<sub>2</sub> monitor to determine CO<sub>2</sub> mass emissions and/or for heat input rate: Report a MHV record using the CO<sub>2</sub> Monitoring System ID, for each hour or partial hour of unit operation. When the hourly CO<sub>2</sub> concentration is missing, or for hours in which the flue gases are discharged through an unmonitored bypass stack, use the missing data routines in §75.35 and 75.36 to provide substitute data values.

If the CO<sub>2</sub> monitor is also used as the diluent monitor for a NO<sub>x</sub>-diluent monitoring system, whenever a CO<sub>2</sub> RATA is failed on the CO<sub>2</sub> monitoring system, then both the CO<sub>2</sub> and NO<sub>x</sub>-diluent monitoring systems are considered out-of-control. (See Appendix B §2.3.2(g)). Report the applicable substitute CO<sub>2</sub> concentration data in the MHV record using the applicable missing data procedures for CO2C. For NO<sub>x</sub> emission rate, report the appropriate substitute data value in the DHV record.

However, if the CO<sub>2</sub> data for the CO<sub>2</sub> monitoring system is considered out-of-control due to the expiration of the applicable CO<sub>2</sub> RATA but the NO<sub>x</sub> RATA has not yet expired,<sup>1</sup> then substitute data should only be used for CO<sub>2</sub> mass and heat input rate calculations and not for calculation of the NO<sub>x</sub> emission rate. For NO<sub>x</sub> emission rate, the actual measured CO<sub>2</sub> concentration should be used. In such cases, report two CO<sub>2</sub> concentrations for each hour until a CO<sub>2</sub> RATA is completed. First, report the appropriate substitute CO<sub>2</sub> data using the CO<sub>2</sub> System ID. Second, report the actual CO<sub>2</sub> value recorded by the CO<sub>2</sub> component, leaving the System ID blank. (The actual CO<sub>2</sub> value will be used in the NO<sub>x</sub> emission rate calculation for the hour, while the substitute data value will be used in the CO<sub>2</sub> mass and heat input rate calculations.)

- b) If you use the CO<sub>2</sub> monitor only to calculate NO<sub>x</sub> emission rate: Report an MHV record for CO<sub>2</sub> concentration. Leave the Monitoring System ID blank. Leave the unadjusted or adjusted hourly values blank for the hour if: (1) a quality-assured CO<sub>2</sub> concentration is not available; or (2) a quality-assured NO<sub>x</sub> concentration is not available; or (3) both (1) and (2). Instead, report a substitute data value for NO<sub>x</sub> emission rate in the DHV record and report an MODC of “46” in the CO2C MHV record.

<sup>1</sup> Note that this situation should only arise if the NO<sub>x</sub> emission rate RATA was done using O<sub>2</sub> as the diluent for the reference method or if the CO<sub>2</sub> RATA data are not submitted. If the RATA was conducted using a CO<sub>2</sub> diluent in the reference method, then there should be sufficient CO<sub>2</sub> data available to submit a RATA for the CO<sub>2</sub> system.

Note that hours in which the flue gases are discharged through an unmonitored bypass stack are considered to be missing data hours. For these hours, do not report a MHV record. In the DHV record, report the NO<sub>x</sub> MER and MODC of “23.”

When a default high range value (200 percent of MPC) or a full-scale exceedance value (200 percent of the range) is used in the calculation of the hourly average NO<sub>x</sub> concentration, the NO<sub>x</sub> concentration is considered to be both quality-assured and available. Therefore, if a quality-assured CO<sub>2</sub> concentration is available for that hour, report a MHV record and calculate the NO<sub>x</sub> emission rate in the usual manner. However, if a quality-assured CO<sub>2</sub> concentration is not available for that hour, the NO<sub>x</sub> emission rate data for the hour are considered missing. In that case, report a MHV record for the hour using an MODC of “46” and report the maximum potential NO<sub>x</sub> emission rate (MER) as a substitute data value in DHV record, using an MODC of “25.”

**Specific Considerations for locations with both primary and primary bypass NO<sub>x</sub>-diluent monitoring systems:**

- When gases flow through both stacks of a combined-cycle turbine with primary and primary bypass NO<sub>x</sub>-diluent monitoring systems designated under a single monitoring location in the same hour, one set of MHV records should be reported for each stack for the hour.
- If both stacks are in control, the stack providing the measured NO<sub>x</sub> emission rate value should report the measured data CO<sub>2</sub>C MHV record as normal. The other stack should report the measured data CO<sub>2</sub>C MHV record and use an MODC of 47 if a) quality-assured NO<sub>x</sub>C is available for the hour, b) quality-assured diluent concentration is available for the hour, and c) these concentration values were not used in determining the hourly NO<sub>x</sub> emission rate.
- If the HRSG stack is in control and the bypass stack is out of control, the NO<sub>x</sub> emission rate will be determined by the greater of the readings from the HRSG stack or MER, or the greater of the readings from the HRSG stack or PB missing data value. If the NO<sub>x</sub> emission rate is quality-assured from the HRSG stack, a standard measured data CO<sub>2</sub>C MHV record should be reported from the HRSG stack and a missing data CO<sub>2</sub>C MHV record using MODC 48 should be reported from the bypass stack. If the NO<sub>x</sub> emission rate is a substitute data value, the HRSG stack should report a measured data CO<sub>2</sub>C MHV record using MODC 47, and a missing data CO<sub>2</sub>C MHV record using MODC 46 should be reported from the bypass stack.
- If the HRSG stack is out of control and the bypass stack is in control, the NO<sub>x</sub> emission rate will be determined by the greater of the readings from the bypass stack or standard unit-level missing data value, or the greater of the readings from the bypass stack or HRSG missing data value. If the NO<sub>x</sub> emission rate is quality-assured from the bypass stack, a standard measured data CO<sub>2</sub>C MHV record should be reported from the bypass stack and a missing data CO<sub>2</sub>C MHV record using MODC 48 should be reported from the HRSG stack. If the NO<sub>x</sub> emission rate is a substitute data value, the bypass stack should report a measured data CO<sub>2</sub>C MHV record using MODC 47, and a missing data CO<sub>2</sub>C MHV record using MODC 46 should be reported from the HRSG stack.

- If both the HRSG and bypass stacks are out of control, the NO<sub>x</sub> emission rate will be a substitute data value. The stack used in determining the NO<sub>x</sub> emission rate should report a missing data CO2C MHV record using MODC 46 and the other stack should report a missing data CO2C MHV record using MODC 48.
- c) If you use the CO<sub>2</sub> monitor to calculate HCl, HF, Hg, and/or SO<sub>2</sub> emission rates and the CO<sub>2</sub> monitor is out-of-control: Report the applicable substitute CO<sub>2</sub> concentration data as required under Part 75 in the MHV record using the applicable missing data procedures for CO2C. Note that MATS does not allow the use of missing data routines. Therefore, report the appropriate out-of-control method of determination code (MODC) for the HCl, HF, Hg, and/or SO<sub>2</sub> emissions rates in the MATS DERIVED HOURLY VALUE DATA (MDHV) record. If the CO<sub>2</sub> monitor is only used to calculate MATS emission rates, report an MODC of “46” when the CO<sub>2</sub> monitor is out-of-control.

**O<sub>2</sub> Concentration**

Report an MHV record for O<sub>2</sub> concentration for each hour in which you use the O<sub>2</sub> concentration to determine the hourly NO<sub>x</sub>, HCl, HF, Hg, or SO<sub>2</sub> emission rates, heat input rate, or CO<sub>2</sub> concentration. Report two MHV records for O<sub>2</sub> concentration (one wet-basis and one dry-basis) for each hour in which you use O<sub>2</sub> concentration to determine percent moisture.

If the O<sub>2</sub> value is used for the heat input calculation, report the MHV record for O<sub>2</sub> for every operating hour and use the appropriate substitute data for any operating hour in which a quality-assured O<sub>2</sub> value is not obtained.

**Table 15: MHV Elements for O2C**

MHV Elements to Report	O2C MHV Records	
	Measured Data	Missing Data <sup>4</sup>
Parameter Code	✓	✓
Unadjusted Hourly Value	✓	✓ <sup>5</sup>
Adjusted Hourly Value		
MODC	✓	✓
Monitoring System ID	1	1
Component ID	✓	✓
Percent Available	2	✓
Moisture Basis	3	3

<sup>1</sup> If the O<sub>2</sub> component is part of a CO<sub>2</sub> system, report the CO<sub>2</sub> System ID. If the O<sub>2</sub> component is part of an O<sub>2</sub> system, report the O<sub>2</sub> System ID. Otherwise, leave the System ID blank.

<sup>2</sup> If the O<sub>2</sub> value is used to calculate heat input, report the Percent Available value for every operating hour.

<sup>3</sup> If the O<sub>2</sub> value is used to calculate H<sub>2</sub>O, report the Moisture basis. Otherwise, leave this field blank.

<sup>4</sup> If the O<sub>2</sub> value is used to calculate heat input, report an MHV record for O2C for every operating hour.

<sup>5</sup> If MODC 46 or 48 is used, do not report the unadjusted hourly value.

- a) Whenever you use an O<sub>2</sub> monitor to determine CO<sub>2</sub> concentration, CO<sub>2</sub> mass emissions, and/or for heat input rate (as part of a CO<sub>2</sub> monitoring system): Report an MHV record using the CO<sub>2</sub> Monitoring System ID, for each hour or partial hour of unit operation in which a quality-assured O<sub>2</sub> value is obtained. When the hourly O<sub>2</sub> concentration is missing, or for hours in which the flue gases are discharged through an unmonitored bypass stack, use the missing data routines in §75.36 to provide substitute data values if the O<sub>2</sub> value is used to determine heat input.

If the O<sub>2</sub> monitor is also used as the diluent monitor for a NO<sub>x</sub>-diluent monitoring system, whenever a CO<sub>2</sub> RATA is failed on the CO<sub>2</sub> monitoring system, then the CO<sub>2</sub> and NO<sub>x</sub>-diluent monitoring systems (as applicable) are each considered to be out-of-control. (See Appendix B §2.3.2(g).) If heat input is calculated from the O<sub>2</sub>, report the applicable substitute O<sub>2</sub> concentration data in the MHV record using the applicable missing data procedures for O2C. For CO<sub>2</sub> concentration, CO<sub>2</sub> mass, and NO<sub>x</sub> emission rate, report the appropriate substitute data values in the appropriate DHV records. However, if the O<sub>2</sub> data for the CO<sub>2</sub> monitoring system is considered out-of-control due to the expiration of the applicable CO<sub>2</sub> RATA but the NO<sub>x</sub> RATA has not yet expired,<sup>2</sup> then substitute data should only be used for CO<sub>2</sub> concentration and heat input rate calculations and not for calculation of the NO<sub>x</sub> emission rate. The actual measured O<sub>2</sub> concentration should be used to calculate NO<sub>x</sub> emission rate. In such cases, report two O<sub>2</sub> concentrations for each hour until a CO<sub>2</sub> RATA is completed. First, report the appropriate substitute O<sub>2</sub> data using the CO<sub>2</sub> system. Second, report the actual O<sub>2</sub> value recorded by the O<sub>2</sub> component, leaving the System ID blank. (The monitor O<sub>2</sub> value will be used in the NO<sub>x</sub> emission rate calculation for the hour, while the substitute data value will be used in the heat input rate calculation.)

If the O<sub>2</sub> monitor is only used to determine derived CO<sub>2</sub> concentration, report an MODC of “46” when O<sub>2</sub> concentration is unavailable.

- b) Whenever you use an O<sub>2</sub> monitoring system to determine heat input rate: Report an MHV record using the O<sub>2</sub> Monitoring System ID, for each hour or partial hour of unit operation. When the hourly O<sub>2</sub> concentration is missing, or for hours in which the flue gases are discharged through an unmonitored bypass stack, use the missing data routines in §75.36 to provide substitute data values.

If the O<sub>2</sub> monitor is also used as the diluent monitor for a NO<sub>x</sub>-diluent monitoring system, whenever O<sub>2</sub> RATA is failed for the O<sub>2</sub> monitoring system, then the NO<sub>x</sub>-diluent monitoring systems is also considered to be out-of-control. (See Appendix B §2.3.2(g).) For heat input that is calculated from the O<sub>2</sub>, report the applicable substitute O<sub>2</sub> concentration data in the MHV record using the applicable missing data procedures for O2C. For NO<sub>x</sub> emission rate, report the appropriate substitute data values in the appropriate DHV record. However, if the O<sub>2</sub> data for the O<sub>2</sub> monitoring system is considered out-of-control due to the expiration of the applicable O<sub>2</sub> RATA but the NO<sub>x</sub> RATA has not yet expired,<sup>3</sup> then substitute data should only be used for calculating heat input rate and not for calculation of the NO<sub>x</sub> emission rate. The actual measured O<sub>2</sub>

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<sup>2</sup> Note that this situation should only arise if the NO<sub>x</sub> emission rate RATA was done using O<sub>2</sub> as the diluent for the reference method or if the CO<sub>2</sub> RATA data are not submitted. If the RATA was conducted using a CO<sub>2</sub> diluent in the reference method, then there should be sufficient CO<sub>2</sub> data available to submit a RATA for the CO<sub>2</sub> system.

<sup>3</sup> Note that this situation should only arise if the NO<sub>x</sub> emission rate RATA was done using CO<sub>2</sub> as the diluent for the reference method or if the O<sub>2</sub> RATA data are not submitted. If the RATA was conducted using an O<sub>2</sub> diluent in the reference method, then there should be sufficient O<sub>2</sub> data available to submit a RATA for the O<sub>2</sub> system.



concentration should be used to calculate NO<sub>x</sub> emission rate. In such cases, report an additional O<sub>2</sub> concentration record for each hour until an O<sub>2</sub> RATA is completed. First, report the appropriate substitute O<sub>2</sub> data using the O<sub>2</sub> System ID. Secondly, report the actual O<sub>2</sub> value recorded by the O<sub>2</sub> component leaving the System ID blank. (The recorded O<sub>2</sub> value will be used in the NO<sub>x</sub> emission rate calculation for the hour, while the O<sub>2</sub>C substitute data value will be used in the heat input rate calculations.)

- c) If the O<sub>2</sub> value is used only for calculating NO<sub>x</sub> emission rate: Report the MHV record for all stack operating hours. Report O<sub>2</sub> unadjusted and adjusted hourly values only when quality-assured values are obtained for both O<sub>2</sub> and NO<sub>x</sub> concentration. Leave the System ID blank.

Leave the unadjusted or adjusted hourly values blank for the hour if (1) a quality-assured O<sub>2</sub> concentration is not available; or (2) a quality-assured NO<sub>x</sub> concentration is not available, or (3) both (1) and (2). Instead, report a substitute data value for NO<sub>x</sub> emission rate in the DHV record and report an MODC of “46” in the O<sub>2</sub>C MHV record.

**Specific Considerations for locations with both primary and primary bypass NO<sub>x</sub>-diluent monitoring systems:**

- When gases flow through both stacks of a combined-cycle turbine with primary and primary bypass NO<sub>x</sub>-diluent monitoring systems designated under a single monitoring location in the same hour, one set of MHV records should be reported for each stack for the hour.
- If both stacks are in control, the stack providing the measured NO<sub>x</sub> emission rate value should report the measured data O<sub>2</sub>C MHV record as normal. The other stack should report the measured data O<sub>2</sub>C MHV record and use an MODC of 47 if a) quality-assured NO<sub>x</sub>C is available for the hour, b) quality-assured diluent concentration is available for the hour, and c) these concentration values were not used in determining the hourly NO<sub>x</sub> emission rate.
- If the HRSG stack is in control and the bypass stack is out of control, the NO<sub>x</sub> emission rate will be determined by the greater of the readings from the HRSG stack or MER, or the greater of the readings from the HRSG stack or PB missing data value. If the NO<sub>x</sub> emission rate is quality-assured from the HRSG stack, a standard measured data O<sub>2</sub>C MHV record should be reported from the HRSG stack and a missing data O<sub>2</sub>C MHV record using MODC 48 should be reported from the bypass stack. If the NO<sub>x</sub> emission rate is a substitute data value, the HRSG stack should report a measured data O<sub>2</sub>C MHV record using MODC 47, and a missing data O<sub>2</sub>C MHV record using MODC 46 should be reported from the bypass stack.
- If the HRSG stack is out of control and the bypass stack is in control, the NO<sub>x</sub> emission rate will be determined by the greater of the readings from the bypass stack or standard unit-level missing data value, or the greater of the readings from the bypass stack or HRSG missing data value. If the NO<sub>x</sub> emission rate is quality-assured from the bypass stack, a standard measured data O<sub>2</sub>C MHV record should be reported from the bypass stack and a missing data O<sub>2</sub>C MHV record using MODC 48 should be reported from the HRSG stack. If the NO<sub>x</sub> emission rate is a substitute data value, the bypass stack should report a measured data O<sub>2</sub>C MHV

record using MODC 47, and a missing data O<sub>2</sub>C MHV record using MODC 46 should be reported from the HRSG stack.

- If both the HRSG and bypass stacks are out of control, the NO<sub>x</sub> emission rate will be a substitute data value. The stack used in determining the NO<sub>x</sub> emission rate should report a missing data O<sub>2</sub>C MHV record using MODC 46 and the other stack should report a missing data O<sub>2</sub>C MHV record using MODC 48.

Note that hours in which the flue gases are discharged through an unmonitored bypass stack are considered to be missing data hours. (For these hours, do not report an MHV record. In the DHV record, report the NO<sub>x</sub> MER and an MODC of “23.”)

- d) If you use the O<sub>2</sub> monitor to calculate HCl, HF, Hg, and/or SO<sub>2</sub> emission rates and the O<sub>2</sub> monitor is out-of-control: Report the applicable substitute O<sub>2</sub> concentration data as required under Part 75 in the MHV record using the applicable missing data procedures for O<sub>2</sub>C. Note that MATS does not allow the use of missing data routines. Therefore, report the appropriate out-of-control method of determination code (MODC) for the HCl, HF, Hg, and/or SO<sub>2</sub> emissions rate in the MATS DERIVED HOURLY VALUE DATA (MDHV) record. If the O<sub>2</sub> monitor is only used to calculate MATS emission rates, report an MODC of “46” when the O<sub>2</sub> monitor is out-of-control.
- e) If you also use wet and dry O<sub>2</sub> monitors to determine the hourly percent moisture: Report two O<sub>2</sub> MHV records for each hour. Report the wet O<sub>2</sub> measurement with a “W” as the MoistureBasis data element and report the dry O<sub>2</sub> measurement with a “D” as the MoistureBasis data element. If either the wet or dry O<sub>2</sub> component is also used to calculate heat input, NO<sub>x</sub>, HCl, HF, Hg, and/or SO<sub>2</sub> emission rates, and/or CO<sub>2</sub> concentration, then follow the applicable reporting instructions from sections (a), (b), (c), or (d) above, to report the data for that component. For the remaining component, report the MHV for each hour, and leave the System ID blank.

If either O<sub>2</sub> value is missing, or for hours in which the flue gases are discharged through an unmonitored bypass stack, perform missing moisture data substitution in the DHV record for moisture, in accordance with §75.37.

If the O<sub>2</sub> monitors are only used to determine hourly percent moisture and either O<sub>2</sub> value is missing, report an MODC of “46” for both the wet and dry O<sub>2</sub> monitors.

### **Moisture (H<sub>2</sub>O)**

For any unit or stack that monitors H<sub>2</sub>O with a moisture sensor (or, for saturated gas streams, from a temperature sensor and look-up table), report the moisture value in a moisture MHV record for each operating hour or partial operating hour.

**Table 16: MHV Elements for H2O**

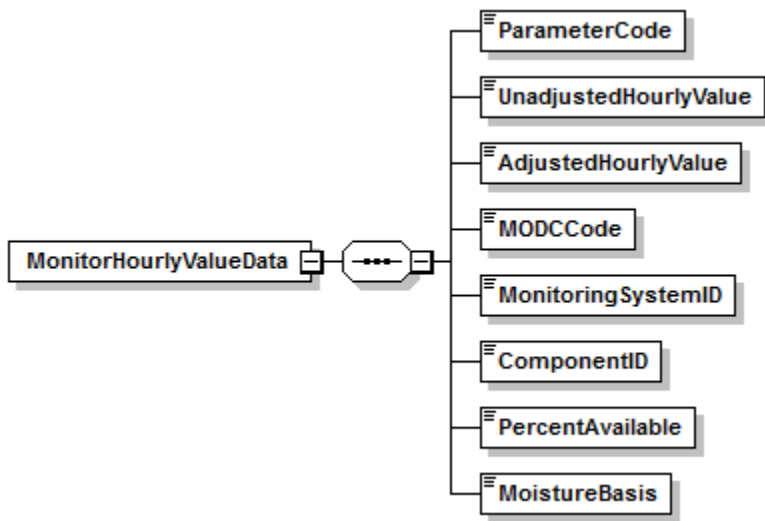
MHV Elements to Report	H2O	
	Measured Data	Missing Data
Parameter Code	✓	✓
Unadjusted Hourly Value	✓	✓
Adjusted Hourly Value		
MODC	✓	✓
Monitoring System ID	✓	✓
Component ID	✓	✓
Percent Available	✓	✓
Moisture Basis		

If you use a fuel-specific default moisture value, as allowed under §75.11 or §75.12 (for coal, wood, and natural gas burning units only), report the value in the MONITOR DEFAULT DATA record and use this constant in the calculation. Do not report a moisture MHV record on an hourly basis. However, if you have more than one active fuel-specific default moisture value defined in your monitoring plan, report the fuel-specific or pro-rated moisture value used in your emissions calculations in an H<sub>2</sub>O DHV record.

The Part 75 missing data procedures for moisture are found in §75.37. These procedures are modeled after the standard missing data procedures for SO<sub>2</sub>. In most instances, the moisture missing data algorithm is the inverse of the SO<sub>2</sub> algorithm (i.e., the lower moisture values are more conservative and therefore an inverted moisture missing data algorithm must be applied (using 10th percentile values instead of 90th percentile values, minimum values instead of maximum values, etc.)). However, when Equations 19-3, 19-4, or 19-8 from Method 19 of 40 CFR Part 60 are used to determine NO<sub>x</sub> emission rate, a higher moisture value is more conservative and therefore the standard SO<sub>2</sub> missing data algorithm must be applied.

Monitor Hourly Value Data XML Model

**Figure 11: Monitor Hourly Value Data XML Elements**



Monitor Hourly Value Data XML Elements

**Parameter Code** (*ParameterCode*)

Report the Parameter Code that corresponds to the parameter monitored at the location defined by the Stack Pipe ID or Unit ID. Use the appropriate uppercase code as shown in Table 17.

**Table 17: Parameter Codes and Descriptions for the MHV Data Record**

Code	Description
CO2C	CO <sub>2</sub> Concentration (% , pct)
FLOW	Volumetric Flow Rate (scfh)
H2O	Moisture (using moisture sensors, or temperature sensors) (% , pct)
NOXC	NO <sub>x</sub> Concentration (ppm)
O2C	O <sub>2</sub> Concentration (% , pct)
SO2C	SO <sub>2</sub> Concentration (ppm)

**Unadjusted Hourly Value** (*UnadjustedHourlyValue*)

Report the unadjusted concentration or stack flow value for the hour. See below for parameter-specific instructions.

SO<sub>2</sub> Concentration

Report the unadjusted, quality-assured SO<sub>2</sub> concentration for the hour, expressed in parts per million (ppm) and round the resulting value to the appropriate number of decimal places per Table 18. For hours in which very low sulfur fuel is combusted, report the actual SO<sub>2</sub>

concentration even if you report a 2.0 ppm default value in the derived hourly value record. Leave this field blank for hours in which you use substitute data.

Leave this field blank for hours in which the flue gases are routed through an unmonitored bypass stack, or when the outlet SO<sub>2</sub> monitor is unavailable and proper operation of the emission controls is not verified, if you report the MPC for those hours. However, if you report data from a certified inlet monitor during those hours, report the unadjusted SO<sub>2</sub> concentration recorded by the monitor.

Do not leave this field blank for hours in which: (1) very low sulfur fuel is combusted and you report a 2.0 ppm default value in the derived hourly value record; or (2) you use the default high range value of 200 percent of the MPC in the calculation of the hourly SO<sub>2</sub> concentration; or (3) a full-scale exceedance occurs and you use 200 percent of the range in the calculation of the hourly SO<sub>2</sub> concentration. All of the hours described in (1) – (3), above, are treated as quality-assured monitor operating hours.

#### NO<sub>x</sub> Concentration

For both NO<sub>x</sub> concentration monitoring systems and NO<sub>x</sub>-diluent monitoring systems, report the unadjusted, quality-assured NO<sub>x</sub> concentration for the hour, expressed in parts per million (ppm) and round the resulting value to the appropriate number of decimal places per Table 18. Leave this field blank for hours in which you use substitute data for NO<sub>x</sub> concentration or MODC “46” for locations with only a NO<sub>x</sub>-diluent monitoring system.

Do not leave this field blank for hours in which: (1) you use a default high range value of 200 percent of the MPC in the calculation of the hourly NO<sub>x</sub> concentration; or (2) a full-scale exceedance occurs and you use 200 percent of the range in the calculation of the hourly NO<sub>x</sub> concentration. All of the hours described in (1) and (2), above are treated as quality-assured monitor operating hours. Refer to the Part 75 Emissions Monitoring Policy Manual for further discussion of overscaling and use of the default high range.

For units with add-on NO<sub>x</sub> emission controls, if you report data from a certified control device inlet monitor during hours in which the outlet NO<sub>x</sub> monitor is unavailable and proper operation of the emission controls is not verified, report the average, unadjusted NO<sub>x</sub> concentration recorded by the inlet monitor.

#### CO<sub>2</sub> Concentration

Report the CO<sub>2</sub> concentration for the hour, expressed in percent CO<sub>2</sub> (%CO<sub>2</sub>) and round the resulting value to the appropriate number of decimal places per Table 18. If applicable, during hours in which you use substitute data, or for hours in which the flue gases are discharged through an unmonitored bypass stack, report the substituted value obtained from the CO<sub>2</sub> missing data procedures under §§75.35 or 75.36 (as applicable). If MODC “46” is used, indicating that the CO<sub>2</sub> concentration for a NO<sub>x</sub>-diluent system is unavailable, leave this field blank. Also leave this field blank when MODC “46” is used for a CO<sub>2</sub> monitor used only to determine MATS emission rates.

If applicable for Hg, HCl, HF, SO<sub>2</sub>, and/or NO<sub>x</sub> emission rate calculations, for each hour in which you use the diluent cap value to calculate emission rate, report the actual quality-assured CO<sub>2</sub> concentration in MHV record for CO2C and appropriate MODC (“01” through “04”), and report an MODC of “14” in the DHV record for NO<sub>x</sub> emission rate and/or an MODC of “37” in

the MDHV for Hg, HCl, HF, or SO<sub>2</sub> emission rate. Note: For MATS reporting, use of the diluent cap is restricted to startup and shutdown hours (as defined in Section 63.10042).

Whenever it is necessary to report a second CO<sub>2</sub> concentration record to calculate Hg and/or NO<sub>x</sub> emission rate for an hour, report the actual CO<sub>2</sub> concentration for the hour and the appropriate MODC (either “01” or “02”). See instructions under Description of Data for CO<sub>2</sub> Concentration.

### O<sub>2</sub> Concentration

Report O<sub>2</sub> concentration for the hour, expressed in %O<sub>2</sub>, and round the resulting value to the appropriate number of decimal places per Table 18. For each hour in which you use the diluent cap value to calculate Hg, HCl, HF, SO<sub>2</sub>, and/or NO<sub>x</sub> emission rate, report the actual quality-assured O<sub>2</sub> concentration and appropriate MODC (“01” through “04”). For each such hour, report an MODC of “14” in the NO<sub>x</sub> emission rate DHV record and/or an MODC of “37” in the MDHV for Hg, HCl, HF, or SO<sub>2</sub> emission rate. Note: For MATS reporting, use of the diluent cap is restricted to startup and shutdown hours (as defined in Section 63.10042).

Leave this field blank if MODC “46” is used, indicating that the O<sub>2</sub> concentration for a NO<sub>x</sub>-diluent system is unavailable and/or the O<sub>2</sub> concentration used only to determine derived CO<sub>2</sub> concentration or hourly moisture is unavailable. Also leave this field blank when MODC “46” is used for an O<sub>2</sub> monitor used only to determine MATS emission rates.

For any hour in which there is a full scale exceedance of the O<sub>2</sub> monitor range, report the appropriate diluent cap value for the type of unit and an MODC of “20.” You must also report a default record in the monitoring plan with a parameter code of O2X and a Default Purpose Code of “DC” containing this value even if you do not calculate an hourly NO<sub>x</sub> Emissions Rate. (Note that you may instead report a time weighted average calculated using the diluent cap value for the portion of the hour that the monitoring range was exceeded with the quality assured data collected during the portion of the hour when the range was not exceeded. In this case, report the hourly average but use an MODC of “20” to indicate a range exceedance has occurred during the hour.) If you use wet and dry O<sub>2</sub> monitors to determine the hourly percent moisture and both values are quality-assured, report two O<sub>2</sub> MHV records for each hour.

If you use O<sub>2</sub> concentration for the heat input rate calculation, report the appropriate substitute data value in this field when a quality-assured O<sub>2</sub> concentration for the hour is unavailable or for hours in which the flue gases are discharged through an unmonitored bypass stack.

### Moisture

Report moisture for the hour, expressed in %H<sub>2</sub>O, and round the resulting value, obtained either from a moisture sensor, or for saturated gas streams, from a temperature sensor and look-up table, to the appropriate number of decimal places per Table 18. Report the appropriate substitute data value for hours in which a quality-assured moisture percentage is unavailable or for hours in which the flue gases are discharged through an unmonitored bypass stack.

### Volumetric Flow

For each operating hour (or partial operating hour) in which a quality-assured flow rate was measured (MODC “01” through “04” and “54”), report the unadjusted flow rate in units of scfh (wet-basis). Report flow rate to the appropriate number of decimal places per Table 18. For missing data hours, leave this field blank (this includes hours in which the flue gases are discharged through an unmonitored bypass stack).

If a start-up or shut-down hour results in a stack flow rate that is too low to be registered by the stack flow monitor, you may report a default minimum stack flow rate of 1,000 scfh. Report an MODC of “55” for the hour. Manual entry of this MODC is permitted.

**Adjusted Hourly Value** (*AdjustedHourlyValue*)

Leave this field blank for parameters CO<sub>2</sub>C, H<sub>2</sub>O, and O<sub>2</sub>C.

**SO<sub>2</sub> Concentration**

For each hour in which you obtain quality-assured values, apply the appropriate bias adjustment factor (BAF) to the rounded average SO<sub>2</sub> concentration for the hour. Report the adjusted SO<sub>2</sub> concentration for the hour in ppm and round the resulting value to the appropriate number of decimal places per Table 18.

Note that for an initial certification, analyzer replacement, or complete monitoring system replacement (as indicated by reporting a QA AND CERTIFICATION EVENT record with a QACertificationEventCode value of “100,” “101,” “120,” or “125”), if you are using conditional data validation, the BAF is uncertain during the conditional data period. Therefore, apply a BAF of 1.000 from the beginning of the conditional data validation period to the completion hour of the certification or recertification RATA.

For each hour in which you use missing data procedures, report the substitute data value.

For each hour in which the flue gases are routed through an unmonitored bypass stack, or when the outlet SO<sub>2</sub> monitor is unavailable and proper operation of the emission controls is not verified, you may either report the MPC in this field or, if data are available from a certified inlet monitor, report the bias-adjusted SO<sub>2</sub> concentration measured by the monitor.

For each hour in which only very low sulfur fuel (as defined in §72.2) is combusted, report the bias-adjusted hourly average SO<sub>2</sub> concentration, unless it is less than 2.0 ppm, in which case, report “2.0 ppm.”

For each hour in which a default high range value is used in the calculation of the hourly average SO<sub>2</sub> concentration, report the bias-adjusted hourly average in this field unless application of the BAF causes the hourly average to exceed 200 percent of the MPC, in which case, report 200 percent of the MPC.

When a full-scale exceedance of the high range occurs and 200 percent of the range is used in the calculation of the hourly average SO<sub>2</sub> concentration, report the bias-adjusted hourly average in this field unless application of the BAF causes the hourly average to exceed 200 percent of the range, in which case, report 200 percent of the range.

Refer to the Part 75 Emissions Monitoring Policy Manual for a further discussion of overscaling and use of the default high range value.

**NO<sub>x</sub> Concentration**

Report data in this field only if you use NO<sub>x</sub> concentration times stack flow rate to determine NO<sub>x</sub> mass emissions. Leave this field blank if you do not have a NO<sub>x</sub> concentration system.

For each hour in which you obtain a quality-assured value, apply the appropriate adjustment factor (1.000 or system BAF) to the rounded average NO<sub>x</sub> concentration for the hour. Report the adjusted average NO<sub>x</sub> concentration for the hour in ppm and round the resulting value to the appropriate number of decimal places per Table 18.

Note that for an initial certification, analyzer replacement, or complete monitoring system replacement (as indicated by reporting a QA AND CERTIFICATION EVENT record with a QACertificationEventCode value of “100,” “101,” “120,” or “125”), if you are using conditional data validation, the BAF is uncertain during the conditional data period. Therefore, apply a BAF of 1.000 from the beginning of the conditional data validation period to the completion hour of the certification or recertification RATA.

For each hour in which NO<sub>x</sub> concentration is missing, report the substitute NO<sub>x</sub> concentration value.

For each hour in which a default high range value is used in the calculation of the hourly average NO<sub>x</sub> concentration, report the bias-adjusted hourly average in this field, unless it exceeds 200 percent of the MPC, in which case, report 200 percent of the MPC.

When a full-scale exceedance of the high range occurs and 200 percent of the range is used in the calculation of the hourly average NO<sub>x</sub> concentration, report the bias-adjusted hourly average in this field, unless it exceeds 200 percent of the range, in which case, report 200 percent of the range.

For units with add-on NO<sub>x</sub> emission controls, if you report data from a certified NO<sub>x</sub> monitor at the control device inlet during hours in which the outlet NO<sub>x</sub> monitor is unavailable and proper operation of the emission controls is not verified, report the average, bias-adjusted NO<sub>x</sub> concentration recorded by the monitor. Include these hours in the missing data lookbacks and treat them as available hours in the PMA calculations.

#### Volumetric Flow

For hours in which quality-assured data are obtained, apply the appropriate bias adjustment factor (1.000 or BAF) to the rounded quality-assured value and report the adjusted stack flow for the hour. Report the resulting value to the appropriate precision according to Table 18. For each hour in which missing data procedures are used to report data, report the substitute data value. When the flue gases are discharged through an unmonitored bypass stack, report the appropriate substitute data value for flow rate (under §75.33) in this field. Do not leave this field blank.

Note that for an initial certification, analyzer replacement, or monitoring system replacement (as indicated by reporting a QA AND CERTIFICATION EVENT record with a QACertificationEventCode value of “300” or “305”), if you are using conditional data validation, the BAF is uncertain during the conditional data period. Therefore, apply a BAF of 1.000 from the beginning of the conditional data validation period to the completion hour of the certification or recertification RATA.



**Table 18: Precision of Reported Values for *Monitor Hourly Value Data***

Parameter Codes	Required Precision*
CO2C, H2O, O2C	One Decimal Place
NOXC, SO2C	One Decimal Place
FLOW	Nearest 1,000 scfh

\* All substitute data values should be rounded to the same precision as quality-assured data.

**MODC Code (*MODCCode*)**

Report the appropriate method of determination code (MODC) to identify the type of monitoring system or value used to measure and report the concentration or stack flow for the hour. For CEMS, manual entry of MODCs “16,” “17,” and “21” is permitted. EPA has reserved codes “01” through “55.” Codes “56” through “99” may be used by vendors and companies for other purposes but must not be reported in a quarterly report.

**Table 19: MODC Codes and Descriptions for *MHV***

Code	Parameters	Description
01	All	Primary Monitoring System (and Primary Bypass (PB))
02	All	Redundant Backup or Regular Non-Redundant Backup Monitoring System
03	All	Approved Alternative Monitoring System
04	All	Reference Method Backup System
05	SO2C	Preapproved Parametric Monitoring Method Data for Controlled Units
06	All	Average Hour Before/Hour After
07	All	Initial Missing Data (§75.31)
08	CO2C NOXC SO2C FLOW	90 <sup>th</sup> Percentile Value in Lookback Period (SO2C and CO2C) <u>or</u> 90 <sup>th</sup> Percentile Value in Lookback Period in Corresponding Load Bin (NOXC and FLOW)
	H2O	90 <sup>th</sup> <u>or</u> 10 <sup>th</sup> Percentile Value in Lookback Period
	O2C	10 <sup>th</sup> Percentile Value in Lookback Period
09	CO2C NOXC SO2C FLOW	95 <sup>th</sup> Percentile Value in Lookback Period (SO2C and CO2C) <u>or</u> 95 <sup>th</sup> Percentile Value in Lookback Period in the Corresponding Load Bin (NOXC and FLOW)
	H2O	95 <sup>th</sup> <u>or</u> 5 <sup>th</sup> Percentile Value in Lookback Period
	O2C	5 <sup>th</sup> Percentile Value in Lookback Period
10	All	Maximum (or Minimum for O <sub>2</sub> or H <sub>2</sub> O, if applicable) Hourly Value in Lookback Period (SO2C, CO2C, O2C, and H2O) <u>or</u> Maximum Value in Lookback Period in Corresponding Load Bin (NOXC and FLOW)

Code	Parameters	Description
11	NOXC FLOW	Average Hourly Value in Load Range in Lookback Period
12	All	Maximum (or Minimum for O <sub>2</sub> or H <sub>2</sub> O, if applicable) Potential Concentration (MPC) or Flow Rate (see Section 2.1 of Appendix A to Part 75)
13	SO <sub>2</sub> C NOXC	Maximum Expected Concentration (MEC) (see §75.34(a)(5))
15	SO <sub>2</sub> C NOXC	1.25 times the maximum hourly controlled concentration at the corresponding load or operation bin, in the applicable lookback period (see §75.34(a)(5))
16	SO <sub>2</sub> C	SO <sub>2</sub> Concentration Value of 2.0 ppm during hours when very low sulfur fuels are combusted. These hours are included in missing data lookback and are treated as available hours for percent availability calculation.
17	CO <sub>2</sub> C NOXC O <sub>2</sub> C SO <sub>2</sub> C	Temporary Like-Kind Replacement Analyzer
18	NOXC SO <sub>2</sub> C	Maximum Potential Concentration (MPC) used to determine the hourly average for the portion of the hour when a high range monitor was unavailable due to an expired linearity or daily calibration error test (See Policy Question 9.20)
19	NOXC SO <sub>2</sub> C	200 percent of MPC; Default High Range Value. These hours <u>are</u> included in missing data lookback and are treated as available hours for percent availability calculations.
20	CO <sub>2</sub> C NOXC O <sub>2</sub> C SO <sub>2</sub> C FLOW	200 percent of the full-scale range setting (or diluent cap for O <sub>2</sub> ) when there is full-scale exceedance of high range. These hours <u>are</u> included in missing data lookback and are treated as available hours for percent availability calculations.
21	CO <sub>2</sub> C H <sub>2</sub> O NOXC SO <sub>2</sub> C	Negative Hourly Average Concentration Replaced with Zero
22	NOXC SO <sub>2</sub> C	Concentration from a certified monitor at the control device inlet, when exhaust gases are routed through an unmonitored bypass stack, or when the outlet monitor is unavailable and proper operation of the emission controls is not verified. These hours are included in missing data lookback and are treated as available hours for percent availability calculations.
23	NOXC SO <sub>2</sub> C CO <sub>2</sub> C	MPC when flue gases are routed through an unmonitored bypass stack. These hours are considered to be missing data hours.
24	NOXC	MEC of NO <sub>x</sub> when flue gases are routed through an unmonitored bypass stack and the add-on NO <sub>x</sub> emission controls are confirmed to be operating properly.
46	CO <sub>2</sub> C NOXC O <sub>2</sub> C FLOW	Missing data hour on a NOXR system where the NO <sub>x</sub> concentration or diluent concentration is missing for an hour, missing data hour for O <sub>2</sub> components only used to determine derived CO <sub>2</sub> concentration or derived H <sub>2</sub> O values, or missing data hour for CO <sub>2</sub> , O <sub>2</sub> , or FLOW components only used to determine MATS emission rates.

Code	Parameters	Description
47	CO2C NOXC O2C	NO <sub>x</sub> concentration and diluent concentration available, but not used to determine NO <sub>x</sub> emission rate. <b>Note:</b> Applicable only to combined-cycle turbines with primary and primary bypass NO <sub>x</sub> -diluent systems designated under a single monitoring location and operating in the same hour. (See Policy Manual Question 16.5)
48	CO2C NOXC O2C	Missing data hour on a NOXR system where the NO <sub>x</sub> concentration or diluent concentration is missing for an hour. <b>Note:</b> Applicable only to combined-cycle turbines with primary and primary bypass NO <sub>x</sub> -diluent systems designated under a single monitoring location and operating in the same hour. (See Policy Manual Question 16.5)
53	All	Other quality-assured methodologies approved through petition. These hours are included in the missing data lookback and are treated as available hours for percent monitor availability calculations.
54	All	Other quality-assured methodologies approved through petition by EPA. These hours are included in missing data lookback and are treated as available hours for percent availability calculations.
55	All	Other substitute data approved through petition by EPA. These hours are <u>not</u> included in missing data lookback and are treated as unavailable hours for percent availability calculations.

### SO<sub>2</sub> Concentration

When very low sulfur fuel is combusted, if a negative SO<sub>2</sub> concentration is replaced (in the Unadjusted Hourly Value field) with a value of zero ppm and the 2.0 ppm default SO<sub>2</sub> concentration is reported in the Adjusted Hourly Value field, report MODC “16,” rather than “21” for that hour.

### NO<sub>x</sub> Concentration

Note that MODCs “06” through “12,” “23,” “24,” and “55” apply only when a separately certified NOXC monitoring system is defined in the monitoring plan and is used to calculate NO<sub>x</sub> mass, and do not apply when only a NO<sub>x</sub>-diluent monitoring system is defined.

MODC “46” only applies to monitoring locations with only a NO<sub>x</sub>-diluent system.

MODC “47” and “48” only apply to combined-cycle turbines with primary and primary bypass NO<sub>x</sub>-diluent monitoring systems designated under a single monitoring location and operating in the same hour.

### CO<sub>2</sub> Concentration

MODCs “06” through “12” apply only when a CO<sub>2</sub> monitor is used for heat input rate or CO<sub>2</sub>-mass determinations.

MODC “46” applies to CO<sub>2</sub> monitors that are only used to calculate NO<sub>x</sub> emission rates or MATS emission rates.

MODC “47” and “48” only apply to combined-cycle turbines with primary and primary bypass NO<sub>x</sub>-diluent monitoring systems designated under a single monitoring location and operating in the same hour.

### O<sub>2</sub> Concentration

MODCs “06” through “12” apply only when a separately certified O<sub>2</sub> monitoring system is defined in the monitoring plan and is used exclusively for heat input rate determinations in accordance with Equation F-17 or F-18 in Appendix F to Part 75.

MODC “46” applies to O<sub>2</sub> monitors that are only used to calculate NO<sub>x</sub> emission rate, O<sub>2</sub> monitors used only to determine derived CO<sub>2</sub> concentration or hourly moisture, or O<sub>2</sub> monitors only used to determine MATS emission rates.

MODC “47” and “48” only apply to combined-cycle turbines with primary and primary bypass NO<sub>x</sub>-diluent monitoring systems designated under a single monitoring location and operating in the same hour.

### **Monitoring System ID** (*MonitoringSystemID*)

Note that hours in which the flue gases are discharged through an unmonitored bypass stack are considered to be missing data hours.

For quality-assured data hours, report the ID of the monitoring system from which the concentration or stack flow was recorded, as follows: (Refer to Tables 10-16 for specific situations other than quality-assured data hours that may require the reporting of monitoring system IDs). If the unit has more than one system for a parameter (i.e., a primary and a backup), report the ID of the primary system. In cases where a bypass stack is represented by a system, report the ID of the appropriate system to which the missing data hour should be attributed.

### SO<sub>2</sub> Concentration

For quality-assured data hours, report the ID of the Monitoring System from which the concentration value was recorded. Also, report the SO<sub>2</sub> concentration Monitoring System ID for the monitoring system in use at the time of any of the following occurrences: (1) when you report the 2.0 ppm default value for an hour during which very low sulfur fuel (as defined in §72.2) is combusted and the bias-adjusted hourly average SO<sub>2</sub> concentration is below 2.0 ppm; or (2) when you use a default high range value of 200 percent of the MPC in the calculation of the hourly average SO<sub>2</sub> concentration; or (3) when a full-scale exceedance of the high range occurs and you use a value of 200 percent of the range in the calculation of the hourly average SO<sub>2</sub> concentration. In these cases, the hours are treated as quality-assured monitor operating hours. Each of these occurrences is included in missing data lookback and is counted as an available hour for percent monitor data availability calculations.

If a like-kind replacement non-redundant backup analyzer is used during a period of maintenance or repair of the primary analyzer (see §75.20(d)), report the primary Monitoring System ID.

### Volumetric Flow

If a full-scale exceedance occurs and you use a value of 200 percent of the range in the calculation of the hourly average flow rate, report the Monitoring System ID of the monitoring system which is in use at the time of the occurrence. Treat such hours as though they are quality-assured monitor operating hours for Part 75 purposes; include them in missing data lookback and count them as available hours for percent monitor data availability calculations.

NO<sub>x</sub> Concentration

If the NO<sub>x</sub> analyzer is only part of a NO<sub>x</sub> emission rate system and not part of any NO<sub>x</sub> concentration system, leave this field blank.

Otherwise, report the System ID for the NO<sub>x</sub> concentration system.

When reporting a default high range value of 200 percent of the MPC or when reporting a value of 200 percent of the range during a full-scale exceedance of the high range, report the System ID of the monitoring system in use at the time of the occurrence of the full-scale exceedance.

If a like-kind replacement non-redundant backup analyzer is used during a period of maintenance or repair of the primary analyzer (see §75.20(d)), report the primary Monitoring System ID.

CO<sub>2</sub> Concentration

If the CO<sub>2</sub> analyzer is only part of a NO<sub>x</sub> emission rate system, leave the System ID blank.

Otherwise, report the applicable System ID for the CO<sub>2</sub> monitoring system defined in the monitoring plan.

Report the Monitoring System ID of the monitoring system in use whenever a full-scale exceedance value of 200 percent of the range is used in the calculation of the hourly average CO<sub>2</sub> concentration. Treat such hours as though they are quality-assured monitor operating hours for Part 75 purposes; include them in missing data lookback and count them as available hours for percent monitor data availability calculations.

If a like-kind replacement non-redundant backup analyzer is used during periods of maintenance and repair of the primary analyzer (see §75.20(d)), report the primary Monitoring System ID.

O<sub>2</sub> Concentration

If the O<sub>2</sub> analyzer is only part of a NO<sub>x</sub> emission rate system (and/or an H<sub>2</sub>O system), leave the System ID blank and use only component IDs to identify the origin of the O<sub>2</sub> concentration values. Otherwise, report the applicable System ID as follows:

- a) If the O<sub>2</sub> concentration is from an O<sub>2</sub> component of an O<sub>2</sub> monitoring system (used to determine hourly heat input rate), report the System ID for the O<sub>2</sub> monitoring system. (Note: the data will be QA'd by an O<sub>2</sub> RATA.)
- b) If the O<sub>2</sub> concentration is from an O<sub>2</sub> component that is part of a CO<sub>2</sub> monitoring system (used for determining CO<sub>2</sub> concentration, CO<sub>2</sub> mass, and hourly heat input rate), report the System ID for the CO<sub>2</sub> monitoring system. (Note: the data will be QA'd by a CO<sub>2</sub> RATA.)

(Note that when either the wet or the dry O<sub>2</sub> component is part of either an O<sub>2</sub> or CO<sub>2</sub> monitoring system, that component will be reported using the applicable monitoring system as described in (a) and (b) above.)

H<sub>2</sub>O Concentration

Report the H<sub>2</sub>O System ID for every hour.

**Component ID** (*ComponentID*)

For each hour of quality-assured data from a CEMS or from a stack gas flow rate system (except for 2-component systems, as noted below), identify the component used during the hour. If the component in use during the hour was a like-kind component, be sure to report the ID of the like-kind component. Refer to Tables 10-16 for specific situations other than quality-assured data hours that may require the reporting of monitoring component IDs. Note that hours in which the flue gases are discharged through an unmonitored bypass stack are considered to be missing data hours.

If a temporary like-kind replacement analyzer is used during periods of maintenance and repair of the primary analyzer (see §75.20(d)), assign and report a unique Component ID number (beginning with the prefix “LK” as defined in the COMPONENT DATA record, e.g., “LK1”) for the like-kind replacement analyzer. The like-kind replacement analyzer Component ID may be manually entered. Note that the LK component must also be identified in the monitoring plan as a monitoring component of the primary monitoring system, and a MODC of “17” must be reported for each hour in which the analyzer provides valid data.

If you determine hourly stack flow rate by averaging (or subtracting) the readings from two flow components which are identified as components of the same monitoring system, leave this field blank. If the hourly flow rate is a substitute data value, leave this field blank. This includes hours in which the flue gases are discharged through an unmonitored bypass stack.

**Percent Available** (*PercentAvailable*)

If applicable for the parameter, report the percent monitor data availability to one decimal place for each hour.

SO<sub>2</sub> Concentration

For units with add-on SO<sub>2</sub> emission controls:

- a) If you report the MPC for hours in which the flue gases are routed through an unmonitored bypass stack, or when the outlet SO<sub>2</sub> monitor is unavailable and proper operation of the emission controls is not verified, do not include these hours in the calculation of percent monitor data availability. Treat these hours as missing data hours.
- b) If you report data from a certified inlet monitor during hours in which the flue gases are routed through an unmonitored bypass stack, or when the outlet SO<sub>2</sub> monitor is unavailable and proper operation of the emission controls is not verified, include these hours in the missing data lookbacks and treat them as available hours in the PMA calculations.

NO<sub>x</sub> Concentration

Report data in this field only if you use NO<sub>x</sub> concentration times stack flow as the primary methodology for NO<sub>x</sub> mass calculations for all hours. Report the percent monitor data availability for each hour.

CO<sub>2</sub> Concentration

Report percent monitor data availability for CO<sub>2</sub> concentration only when the CO<sub>2</sub> value is used for determining CO<sub>2</sub> mass rate or heat input rate.

**O<sub>2</sub> Concentration**

Report percent monitor data availability for O<sub>2</sub> concentration only when the O<sub>2</sub> value is used for determining heat input rate.

**Moisture (H<sub>2</sub>O)**

If you use the standard moisture missing data procedures in §75.37, which are based on percent availability, calculate and report the moisture percent data availability for each operating hour.

**Moisture Basis (*MoistureBasis*)**

Leave this field blank unless you use wet and dry O<sub>2</sub> values to determine hourly moisture.

Since you are required to report separate hourly MHV records for each parameter (i.e., for wet basis O<sub>2</sub> and dry basis O<sub>2</sub>), report one of the following uppercase codes to indicate the moisture basis of the hourly O<sub>2</sub> reading.

**Table 20: Moisture Basis Codes and Descriptions for *MHV***

Code	Description
D	Dry
W	Wet

## 2.5.1.1 MATS Monitor Hourly Value Data

### MATS Monitor Hourly Value Data Overview

If your EGU is subject to the MATS Rule (40 CFR Part 63, Subpart UUUUU), use the MATS MONITOR HOURLY VALUE DATA (MMHV) record to report each parameter (i.e., hazardous air pollutant (HAP)) that is measured by a continuous emission monitoring system (CEMS) or a sorbent trap monitoring system. The monitored parameters that are required to be reported using the ECMPS Client Tool may include Hg concentration, HCl concentration, and/or HF concentration. These instructions contain a subsection for each measured parameter, in order to give specific direction on how to report for that parameter. Other parameters applicable to MATS that are also required to be reported according to Part 75, such as SO<sub>2</sub>, CO<sub>2</sub>/O<sub>2</sub> concentration, stack gas flow rate, and moisture, are reported using the MONITOR HOURLY VALUE DATA (MHV) record.

(Note: If you use the low-emitting EGU (LEE) methodology for Hg, you are not required to report hourly Hg concentration data.)

#### **Hg Concentration**

If you measure the hourly average Hg concentration using a CEMS or sorbent trap monitoring system, report a MMHV record for each hour of unit operation-- including hours when a quality-assured Hg concentration value is not obtained.

There are no missing data substitution requirements or bias adjustment requirements for Hg concentration in Appendix A of Subpart UUUUU.

#### **HCl and HF Concentration**

If you measure the hourly average HCl and/or HF concentration using CEMS, report a MMHV record for each hour of unit operation—including hours when a quality-assured HCl or HF concentration value is not obtained.

There are no missing data substitution requirements or bias adjustment requirements for HCl or HF concentration in 40 CFR 63, Subpart UUUUU, Appendix B.

The MMHV elements to be reported are summarized in Table 21, below:

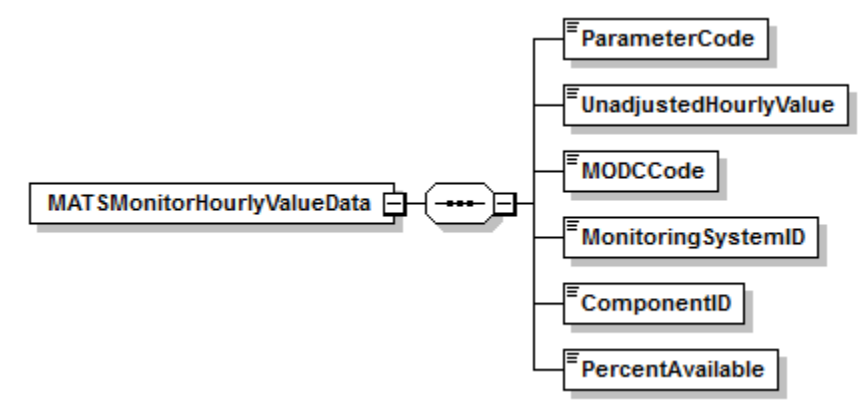
**Table 21: MMHV Elements for HGC, HCLC and HFC**

<b>MMHV Elements to Report</b>	<b>Measured</b>	<b>Unavailable</b>
Parameter Code	✓	✓
Unadjusted Hourly Value	✓	
MODC	✓	✓
Monitoring System ID	✓	✓
Component ID	✓	✓
Percent Available	✓	✓



**MATS Monitor Hourly Value Data XML Model**

**Figure 12: MATS Monitor Hourly Value Data XML Elements**



**MATS Monitor Hourly Value Data XML Elements**

**Parameter Code** (*ParameterCode*)

Report the Parameter Code that corresponds to the parameter monitored at the location defined by the Stack Pipe ID or Unit ID. Use the appropriate uppercase code as shown in Table 22.

**Table 22: Parameter Codes and Descriptions for the MMHV Data Record**

Code	Description
HGC	Hg Concentration (µg/scm)
HCLC	HCl concentration (ppm)
HFC	HF concentration (ppm)

**Unadjusted Hourly Value** (*UnadjustedHourlyValue*)

Report the unadjusted concentration for the hour. See below for parameter-specific instructions.

**Hg Concentration**

Report the quality-assured, unadjusted Hg concentration for the hour (obtained with an Hg CEMS or sorbent trap monitoring system, as applicable), expressed in µg/scm **and rounded to three significant figures** using scientific notation. For example, “0.0144 µg/scm” should be reported as “1.44E-2.” The “E” must be capitalized, and the field must not contain spaces in between the characters. Report only one **leading non-zero digit figure** to the left of the decimal point, **and one digit after the decimal point**. Do not use “plus” characters after the “E” when reporting concentrations greater than or equal to one. For example, “1.44 µg/scm” should be reported as “1.44E0.” For sorbent trap monitoring systems, report the same Hg concentration value for each hour of the sample collection period, except for “transition hours” (see “Specific Considerations,” below). **For data prior to September 9, 2020, report the Hg concentration in scientific notation rounded to three significant figures. For example, if the concentration is 0.159 µg/scm, report 1.59E-1.**

Leave this field blank when a quality-assured Hg concentration value is not available.

### HCl and HF Concentration

Report the quality assured, unadjusted HCl or HF concentration for the hour (as applicable) expressed in ppm, ~~rounded to three significant figures~~ using scientific notation, as shown above for Hg concentration. Leave this field blank when a quality-assured HCl or HF concentration value is not available. For data prior to September 9, 2020, report the HCl or HF concentration in scientific notation rounded to three significant figures. For example, if the concentration is 0.159 µg/scm, report 1.59E-1.

### **MODC Code (MODCCode)**

Report the appropriate method of determination code (MODC) to identify the type of monitoring system or value used to measure and report the Hg, HCl, or HF concentration for the hour. For CEMS, entry of MODCs “17” and “21” is permitted. For sorbent trap monitoring systems, entry of MODCs 01, 02, 32, 33, 34, 35, 41, 42, 43 and 44 is permitted. EPA has reserved codes “01” through “55.” Codes “56” through “99” may be used by vendors and companies for other purposes but must not be reported in a quarterly report.

**Table 23: MODC Codes and Descriptions for MMHV**

Code	Parameters	Description
01	All	Primary Monitoring System
02	All	Redundant Backup or Regular Non-Redundant Backup Monitoring System
17	HGC, HCLC, HFC	Temporary Like-Kind Replacement Analyzer (CEMS only)
21	HGC, HCLC, HFC	Negative Hourly Average Concentration Replaced with Zero (CEMS only)
32	HGC	Hourly Hg concentration determined from analysis of a single sorbent trap multiplied by a factor of 1.111
33	HGC	Hourly Hg concentration determined from the sorbent trap with the higher Hg concentration (relative deviation criterion for the paired traps is not met)
34	HGC, HCLC, HFC	Hourly Hg, HCl, or HF concentration missing or invalid
35	HGC, HCLC, HFC	Hourly Hg, HCl, or HF concentration not monitored (flue gases routed through an unmonitored bypass stack)
41	HGC	Hourly Hg concentration determined from two different pairs of sorbent traps from the same system during the hour. This code applies only to routine sorbent trap change outs during normal, day-to-day operation of the sorbent trap monitoring system.
42	HGC	Hourly Hg concentration determined from two different pairs of sorbent traps during the hour. This code applies only to sorbent trap change outs that occur during RATA test periods.
43	HGC	Hourly Hg concentration reported as method detection level when the sorbent trap concentration reading is below the method defined analytical detection level (see 63.10007(e)(1))

Code	Parameters	Description
44	HGC	Hourly Hg concentration determined from analysis of a single sorbent trap which reports the method detection level, multiplied by a factor of 1.111 in cases where the other trap was accidentally lost, damaged, or broken and could not be analyzed

### Hg, HCl, and HF Concentration

For an Hg, HCl, or HF CEMS or sorbent trap system, report all valid hourly concentration values using a MODC of “01” (or “02” if using a backup system).

If the hourly concentration is unavailable or invalid, report MODC “34” in the MMHV record for concentration and MODC “38” in the MDHV record for emission rate.

If the hourly concentration is below the method detection level, report the method detection level as the measured emissions level and report a MODC of “43” for either trap with a concentration below the method detection level. Report a MODC of “44” if one trap in a paired train meets the criteria to report the method detection level and the second trap is accidentally lost, damaged, or broken and could not be analyzed.

For sorbent trap monitoring systems, report the same MODC for each hour of the sample collection period except for “transition” hours when sorbent traps are changed out and data from more than one set of sorbent traps are used to calculate the Hg concentration. For routine trap change outs during normal, day-to-day operation of the sorbent trap monitoring system, report an MODC of “41” to indicate quality assured data hours during trap change out. For trap change outs that occur during RATA test periods, report an MODC of “42” to indicate quality assured data hours during RATA testing.

### **Monitoring System ID** (*MonitoringSystemID*)

For quality-assured data hours, report the ID of the monitoring system from which the Hg, HCl, or HF concentration value was determined.

If a temporary like-kind replacement analyzer is used during a period of maintenance or repair of the primary Hg, HCl, or HF analyzer, report the primary monitoring system ID for each hour of quality-assured data obtained with the replacement analyzer.

### **Component ID** (*ComponentID*)

For each hour of quality-assured data from an Hg, HCl, or HF CEMS, identify the component used during the hour. For sorbent trap monitoring systems, leave this field blank for all operating hours. Note that hours in which the flue gases are discharged through an unmonitored bypass stack are considered to be data unavailable hours.

If a temporary like-kind replacement analyzer is used during periods of maintenance and repair of the primary analyzer, assign and report a unique Component ID number (beginning with the prefix “LK” as defined in the COMPONENT DATA record, e.g., “LK1”) for the like-kind replacement analyzer (see section 2.2.3 of Appendix A and section 2.2 of Appendix B to Subpart UUUUU). The like-kind replacement analyzer Component ID may be manually entered. Note that the LK component must also be identified in the monitoring plan as a monitoring component of the primary monitoring system, and a MODC of “17” must be reported for each hour in which the analyzer provides valid data.

**Percent Available** (*PercentAvailable*)

You must calculate and report the percent monitor data availability (PMA) for Hg, HCl, or HF concentration (as applicable) according to §75.32, for both Hg CEMS and sorbent trap monitoring systems (see Subpart UUUUU, Appendix A, sections 7.1.3.5, 7.1.4.8, and 7.2.5.3.3 and Appendix B, section 10.1.3.5). Hours with reported MODC values of 32 or 33 are “data available” hours for Hg concentration. Hours with reported MODC values of 34 and 35 are “data unavailable” hours.

**Specific Considerations****Sorbent Trap Systems**

- Report the sorbent trap results for each operating hour during the collection period (including hours during which sampling occurred during any portion of the hour). If more than one set of traps are used during an hour, EPA recommends that you report the average concentration (straight average or time weighted) for all traps used during that hour. Do not average concentrations from traps from two separate systems.
- The installation of a sorbent trap system nullifies the option to report a non-operating file during the quarter in which the trap was installed.

## 2.5.2 Derived Hourly Value Data

### Derived Hourly Value Data Overview

Submit a DERIVED HOURLY VALUE DATA (DHV) record for each overall parameter value determined at this monitoring location for each operating hour (or partial hour). This includes emissions values calculated from continuous emissions monitoring (CEM) data, as well as the overall NO<sub>x</sub> emission rate determined using Appendix E, the overall mass emission rates and heat input rate determined using Appendix D and Appendix G, and the hourly value for each parameter determined using the low mass emissions (LME) provisions. For hours in which the unit or stack did not operate, do not report this record. Derived emissions values include SO<sub>2</sub> mass (lb) or mass rate (lb/hr), NO<sub>x</sub> emission rate, NO<sub>x</sub> mass or mass rate, calculated H<sub>2</sub>O concentration, calculated CO<sub>2</sub> concentration, Heat Input or Heat Input rate, and CO<sub>2</sub> mass or mass rate values. Reporting instructions for each of the derived parameters are described in detail below.

#### **For CEM Methods**

##### Derived Hourly Heat Input Rate (mmBtu/hr)

For each unit or stack with a stack flow monitor and diluent monitor, report the calculated heat input rate in the AdjustedHourlyValue element of a DHV record. If you monitor heat input rate and report this record at a common stack, also apportion the heat input rate measured at the common stack to the individual units (i.e., report additional DHV records for heat input rate under the associated Unit IDs). If you monitor heat input rate and report this record at multiple stacks, also report the heat input rate for the unit in an additional DHV record.

##### Derived SO<sub>2</sub> Hourly Mass Emission Rate (lb/hr)

For each unit or stack with an SO<sub>2</sub> CEMS (or using the F23 methodology per §75.11(e)(1)), report the calculated SO<sub>2</sub> mass emission rate in the AdjustedHourlyValue element of a DHV record.

If you monitor SO<sub>2</sub> mass emission rate and report this record at a common stack, do not apportion the SO<sub>2</sub> mass emission rate measured at the common stack to the individual units (i.e., do not report any additional DHV records under the associate Unit IDs).

If, for a particular unit, you monitor SO<sub>2</sub> mass emission rate at multiple stacks (or ducts), do not report the combined SO<sub>2</sub> mass emission rate for the unit (i.e., do not report any unit-level DHV records).

##### Derived NO<sub>x</sub> Hourly Emission Rate (lb/mmBtu)

For each unit or stack with a NO<sub>x</sub> emission rate CEMS, report the calculated NO<sub>x</sub> emission rate in the UnadjustedHourlyValue element and the bias-adjusted emission rate in the AdjustedHourlyValue element of a DHV record. If you monitor NO<sub>x</sub> emission rate and report this record at a common stack, do not apportion the NO<sub>x</sub> emission rate measured at the common stack to the individual units (i.e., do not report any additional DHV records under the associated Unit IDs).

If, for a particular unit, you monitor NO<sub>x</sub> emission rate at multiple stacks (or ducts), calculate the heat-input weighted hourly emission rate for the unit, but do not report those hourly unit level values (i.e., do not report any unit-level DHV records for NO<sub>x</sub> emission rate). Rather, only use

them to calculate the quarterly and cumulative NO<sub>x</sub> emission rates for the unit. Report these quarterly and cumulative values in the unit-level SUMMARY VALUE DATA record.

For a combined-cycle turbine that uses a multiple-stack configuration, report separate stack-level DHV records for each hour in which there is both main stack and bypass stack operating time. Then, calculate a time-weighted unit-level NO<sub>x</sub> emission rate for each hour, as described in the SUMMARY VALUE DATA record instructions. Store, but do not report, these time-weighted, hourly unit-level emission rates. Rather, only use them to calculate the quarterly and cumulative unit-level NO<sub>x</sub> emission rates.

#### For Derived NO<sub>x</sub> Mass Emission Rate (lb/hr)

For each unit, stack, or pipe at which NO<sub>x</sub> mass emissions are measured or estimated, submit a DHV record, for every hour in the reporting period that the unit or stack operates.

If you monitor NO<sub>x</sub> mass emissions and report this record at a common stack, do not apportion the NO<sub>x</sub> mass emissions measured at the common stack to the individual units (i.e., do not report any additional DHV records under the associated Unit IDs).

If, for a particular unit, NO<sub>x</sub> mass emissions is monitored at multiple stacks (or ducts), do not report the combined hourly NO<sub>x</sub> mass emissions for the unit (i.e., do not report any unit-level DHV records for NO<sub>x</sub> mass rate).

#### Derived CO<sub>2</sub> Mass Emission Rate (tons/hr)

For any operating hour (or partial hour) for each unit, stack, or pipe at which CO<sub>2</sub> emissions are monitored using CEMS, including the use of O<sub>2</sub> CEMS, report CO<sub>2</sub> mass emission rate in a DHV record.

If you monitor CO<sub>2</sub> mass emission rate and report this record at a common stack, do not apportion the CO<sub>2</sub> mass emission rate measured at the common stack to the individual units (i.e., do not report any additional DHV records under the associated unit IDs).

If, for a particular unit, CO<sub>2</sub> mass emission rate is monitored at multiple stacks (or ducts), do not report the combined CO<sub>2</sub> mass emission rate for the unit (i.e., do not report any unit-level DHV records).

#### Derived CO<sub>2</sub> Concentration

For any operating hour (or partial hour) for each unit or stack at which CO<sub>2</sub> concentration is determined by calculating it from O<sub>2</sub> readings, report the derived CO<sub>2</sub> concentration value for each operating hour or partial operating hour in this record. Note that measured CO<sub>2</sub> concentration from a CO<sub>2</sub> system utilizing a CO<sub>2</sub> monitor should be recorded in the MONITOR HOURLY VALUE DATA (MHV) record.

#### Derived H<sub>2</sub>O (Moisture) Value

For any operating hour (or partial hour) for each unit or stack at which moisture is determined by calculating it from wet and dry O<sub>2</sub> readings, report the derived moisture value for each operating hour or partial operating hour in this record.

Note that measured H<sub>2</sub>O values from a moisture sensor or a temperature sensor and look-up table, if reporting for saturated gas streams, should be reported in the MHV record.

If you use a fuel-specific default moisture value, as allowed under §75.11 or §75.12 (for coal and wood-burning units and natural gas-fired boilers) and you have just one default value defined in your monitoring plan, do not report a MHV record or a DHV record on an hourly basis. However, if you have more than one active fuel-specific default moisture value defined in your monitoring plan, report the fuel-specific or pro-rated moisture value used in your emissions calculations in an H<sub>2</sub>O DERIVED HOURLY VALUE DATA record with a Method of Determination Code (MODC) of “40” on an hourly basis.

## **Appendix D Methods**

### Heat Input

If you use Appendix D fuel flowmetering to determine heat input, report the heat input rate calculated for each fuel in the appropriate HOURLY PARAMETER FUEL FLOW DATA records. In addition, report the total heat input rate for the hour in a DHV record for the location. (You must report this record even if only one fuel was combusted during the hour.) If the fuel flowmetering is at a common pipe, also report the apportioned hourly heat input rate in a DHV record for each unit that is part of the common pipe.

### SO<sub>2</sub>

If you use Appendix D fuel flowmetering to determine SO<sub>2</sub>, report the SO<sub>2</sub> mass emission rate calculated for each fuel in the appropriate HOURLY PARAMETER FUEL FLOW DATA record. In addition, report the total SO<sub>2</sub> mass emission rate for the hour in a DHV record for the location. (You must report this record even if only one fuel was combusted during the hour.) If the fuel flowmetering is at a common pipe, do not report hourly apportioned SO<sub>2</sub> for the units.

## **Appendix G Method for Hourly CO<sub>2</sub>**

If you use Equation G-4 to determine hourly CO<sub>2</sub>, report the CO<sub>2</sub> mass emission rate calculated for each fuel in the appropriate HOURLY PARAMETER FUEL FLOW DATA record. In addition, report the total CO<sub>2</sub> mass emission rate for the hour in a DHV record. (You must report this record even if only one fuel was combusted during the hour.)

## **Appendix E Method for Hourly NO<sub>x</sub> Emission Rate**

If you use Appendix E to determine NO<sub>x</sub> emission rate, report the overall NO<sub>x</sub> emission rate for the hour in a DHV record. If you burn a single, consistent blend of fuels and established a single Appendix E curve for that fuel blend, report all the Appendix E related information in this DHV record. If you established a separate Appendix E curve for each fuel, report the fuel-specific NO<sub>x</sub> emission rate data in the appropriate HOURLY PARAMETER FUEL FLOW DATA record and in addition, report the overall NO<sub>x</sub> emission rate for the hour in a DHV record. (You must report this record even if only one fuel was combusted during the hour.)

## **Hourly NO<sub>x</sub> Mass Rate Based on Appendix D Heat Input Rate**

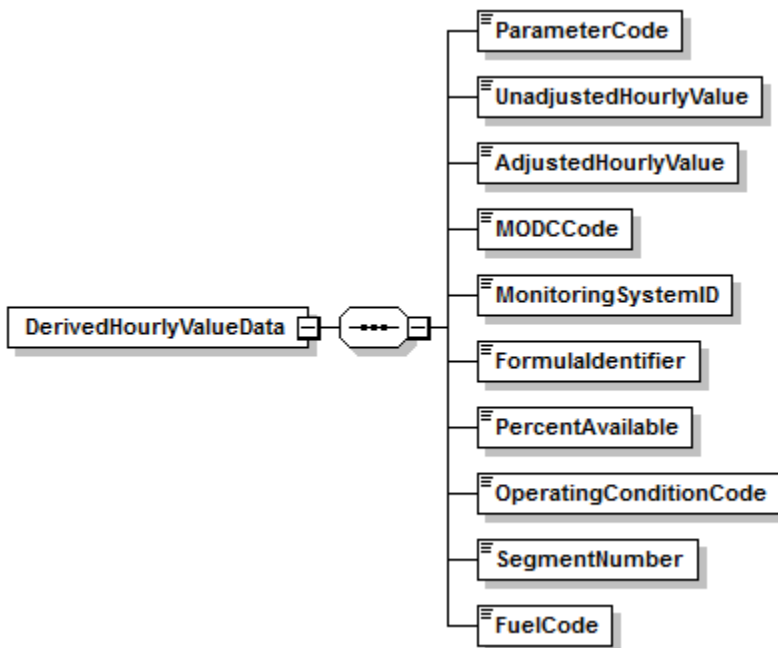
If you are required to report NO<sub>x</sub> mass rate, calculate this value from the heat input rate and NO<sub>x</sub> emission rate reported in the DHV record and report it in a DHV record.

## **LME Methods**

For each parameter reported using the LME method, report a DHV record for each operating hour.

Derived Hourly Value Data XML Model

**Figure 13: Derived Hourly Value Data XML Elements**



Derived Hourly Value Data XML Elements

**Parameter Code** (*ParameterCode*)

Report the appropriate Parameter Code as shown in Table 24.

**Table 24: Parameter Codes and Descriptions for the DHV Data Record**

Code	Description
CO2	CO <sub>2</sub> Hourly Mass Emission Rate (tons/hr)
CO2C	CO <sub>2</sub> Concentration (derived from O <sub>2</sub> measurements) (% CO <sub>2</sub> )
CO2M	CO <sub>2</sub> Hourly Mass (tons) (LME)
H2O	Moisture (from wet/dry O <sub>2</sub> measurements) (%H <sub>2</sub> O)
HI	Heat Input Rate (mmBtu/hr)
HIT	Heat Input Total (mmBtu) (LME)
NOX	NO <sub>x</sub> Hourly Mass Emission Rate (lb/hr)
NOXM	NO <sub>x</sub> Hourly Mass (lb) (LME)
NOXR	NO <sub>x</sub> Emissions Rate (lb/mmBtu)
SO2	SO <sub>2</sub> Hourly Mass Rate (lb/hr)
SO2M	SO <sub>2</sub> Hourly Mass (lb) (LME)



**Unadjusted Hourly Value** (*UnadjustedHourlyValue*)

Report the unadjusted derived hourly value for the parameter specified, as follows:

NO<sub>x</sub> Emission Rate from CEM

Calculate and report the NO<sub>x</sub> emission rate (lb/mmBtu) based on the unadjusted NO<sub>x</sub> concentration and unadjusted diluent (CO<sub>2</sub> or O<sub>2</sub>) concentration recorded in the MHV record. Report the resulting value to the appropriate number of decimal places in Table 25. For hours in which you use missing data procedures leave this field blank, including hours in which the flue gases are discharged through an unmonitored bypass stack.

If you use Equation 19-3 or 19-5 to determine NO<sub>x</sub> emission rate, you must use modified Equation 19-3D or 19-5D (as applicable) instead of Equation 19-3 or 19-5, for hours in which you use the diluent cap (see Table 29 in the MONITORING FORMULA DATA record in the Monitoring Plan Reporting Instructions).

All Other Parameters

Leave this field blank.

**Adjusted Hourly Value** (*AdjustedHourlyValue*)

Report the adjusted or “final” derived hourly value for the parameter specified.

SO<sub>2</sub> Mass Emission Rate (lb/hr)

For CEM methods, this value is normally derived using the bias-adjusted stack flow and the bias-adjusted SO<sub>2</sub> concentration (each reported in the MHV record), in conjunction with the appropriate equation in Appendix F to Part 75. However, for an hour in which a very low sulfur fuel (see §72.2) is combusted, the value may be calculated from a CEMS-derived heat input rate (i.e., from monitored stack flow rate, and diluent (CO<sub>2</sub> or O<sub>2</sub>) concentration) and a default SO<sub>2</sub> emission rate using Equation F-23 (see §75.11(e)(1)).

For Appendix D units and pipes, report the total SO<sub>2</sub> mass emission rate for the location in this field. Use formula D-12 to combine SO<sub>2</sub> mass emission rates from multiple fuels (as reported in HOURLY PARAMETER FUEL FLOW).

Report all data for this element in lb/hr and to the appropriate number of decimal places per Table 25.

NO<sub>x</sub> Mass Emission Rate (lb/hr)

If you use NO<sub>x</sub> concentration times stack flow rate to determine NO<sub>x</sub> mass emissions, use the bias-adjusted stack flow and the bias-adjusted NO<sub>x</sub> concentration, (each reported in the MHV record), in conjunction with the appropriate equation in Appendix F to Part 75. If instead, NO<sub>x</sub> mass emissions are calculated from the NO<sub>x</sub> emission rate times heat input rate, use the adjusted NO<sub>x</sub> emission rate and adjusted heat input values as reported in the DHV record for each parameter. Report data for this element in lb/hr and to the appropriate number of decimal places per Table 25.

NO<sub>x</sub> Emission Rate (lb/mmBtu)CEM Systems

For each hour in which you report NO<sub>x</sub> emission rate in the UnadjustedHourlyValue element, apply the appropriate adjustment factor (1.000 or bias adjustment factor (BAF)) to the rounded

average NO<sub>x</sub> emission rate and report the adjusted NO<sub>x</sub> emission rate for the hour. Report the resulting value to the appropriate number of decimal places per Table 25. Report the appropriate substitute data value for NO<sub>x</sub> emission rate for each hour that a quality-assured emission rate is not obtained, including hours in which the flue gases are discharged through an unmonitored bypass stack. Do not leave this field blank.

Note that for an initial certification, analyzer replacement, or complete monitoring system replacement (as indicated by reporting a QA CERTIFICATION EVENT record with an Event Code of 100, 101, 120, 125, 151, 250, 255, 300 or 305), if you are using conditional data validation, the BAF is uncertain during the conditional data period. Therefore, apply a BAF of 1.000 from the beginning of the conditional data validation period to the completion hour of the certification or recertification RATA. For any other events that require a RATA, apply the BAF from their previous RATA during the conditional data period, unless that RATA failed or was aborted, in which case use 1.000.

For a combined-cycle combustion turbine (CT) using a multiple-stack configuration to report NO<sub>x</sub> emission rate, use missing data substitution for any transition hour (i.e., an hour during which gases flow through both stacks), if either the main stack or bypass monitoring system is out of service, and draw the appropriate substitute data value from the bypass stack data pool.

If a full-scale exceedance of the low NO<sub>x</sub> range occurs and you use a default high range value of 200 percent of the MPC in the calculation of the hourly average NO<sub>x</sub> concentration reported in the MHV record, or if a full-scale exceedance of the high NO<sub>x</sub> range occurs and you use a value of 200 percent of the range in the calculation of the hourly average NO<sub>x</sub> concentration reported in the MHV record, use the reported NO<sub>x</sub> concentration in conjunction with the quality-assured diluent concentration for the hour to calculate and report the NO<sub>x</sub> emission rate. These hours are treated as quality-assured monitor operating hours; they are included in missing data lookback and are treated as available hours for percent monitor data availability calculations.

If a diluent concentration is unavailable during an hour in which a full scale exceedance of the NO<sub>x</sub> analyzer occurs or an hour in which the default high range value is used, the NO<sub>x</sub> emission rate for the hour is considered to be missing. In that case, do not report Monitor Hourly Value for NO<sub>x</sub> concentration for this hour since the NO<sub>x</sub> emission rate cannot be calculated; instead, report the maximum potential NO<sub>x</sub> emission rate (MER) in this field, and use an MODC of “25.”

#### Appendix E Systems

Report the overall NO<sub>x</sub> emission rate for the unit to the appropriate number of decimal places per Table 25. If this value was determined from a consistent fuel mix curve, also report the appropriate System ID for the Appendix E NO<sub>x</sub> system. If a single fuel curve or curves were defined, report the fuel-specific NO<sub>x</sub> emission rate in the appropriate PARAMETER FUEL FLOW DATA record(s), and report the combined NO<sub>x</sub> emission rate for the unit in this record.

#### CO<sub>2</sub> Concentration (Derived from O<sub>2</sub> Concentration) (pct)

Report the CO<sub>2</sub> Concentration for the hour to the appropriate number of decimal places per Table 25. This is either the value calculated from a quality-assured O<sub>2</sub> concentration value (as reported in the MHV record), or the appropriate substitute data value, as specified in §75.35.

CO<sub>2</sub> Mass Emission Rate (tons/hr)

If you are using CEMS, this value is derived using the bias-adjusted stack flow and either the unadjusted CO<sub>2</sub> concentration reported in the MHV record (if you are using a CO<sub>2</sub> analyzer), or the CO<sub>2</sub> Concentration reported in the DHV record (if you are using an O<sub>2</sub> analyzer), in conjunction with the appropriate equation in Appendix F to Part 75.

For units using Appendix G, calculate and report, in PARAMETER FUEL FLOW DATA record(s), the CO<sub>2</sub> mass emissions (tons/hr) for each fuel separately using Equation G-4. Then use Equation G-4A (see Table 32, MONITORING FORMULA DATA record in the Monitoring Plan Reporting Instructions) to determine the combined CO<sub>2</sub> mass emission rate for the hour. Report the combined hourly CO<sub>2</sub> mass emission rate (tons/hr) in this field in the DHV record.

Report this element in tons per hour and to the appropriate number of decimal places per Table 25.

H<sub>2</sub>O (Moisture) (pct)

Report moisture for the hour, expressed in %H<sub>2</sub>O, rounded to one decimal place. Report the appropriate substitute data value for hours in which a quality-assured moisture percentage is unavailable or for hours in which the flue gases are discharged through an unmonitored bypass stack.

Heat Input (HI) Rate (mmBtu/hr)

Report this value in mmBtu per hour (mmBtu/hr) and to the appropriate number of decimal places per Table 25. If you use CEMS to determine hourly heat input rate, calculate the hourly rate using the diluent gas concentration, bias-adjusted hourly stack flow rate, percent moisture (if appropriate), and F-factor.

If you measure and report heat input rate at a common stack or pipe, also apportion and report heat input rate at the unit level. This apportionment should be based on megawatts, steam load, or fuel flow rate, using Equation F-21A, F-21B, or F-21D in Appendix F to Part 75, as applicable. These formulas use time-weighted hourly load to apportion the heat input rate measured at a common stack to the individual units.

For each hour, the sum of the individual heat inputs in mmBtu (i.e., the sum of the individual unit heat input rates, each multiplied by the corresponding unit operating time) must equal the total common stack heat input in mmBtu (i.e., the common stack heat input rate multiplied by the common stack operating time).

For a unit with a multiple stack configuration, with flow rate and diluent monitors on each stack, calculate the hourly heat input rate for the unit using Equation F-21C in Appendix F to Part 75. Also use Equation F-21C for multiple pipe configurations.

For each hour, the total unit heat input in mmBtu (i.e., the unit heat input rate multiplied by the unit operating time) must equal the sum of the individual stack (or pipe) heat inputs in mmBtu (i.e., the sum of the individual stack (or pipe) heat input rates, each multiplied by the corresponding stack (or pipe) operating time).

For Appendix D units combusting multiple fuels, report the hourly heat input rate calculated from all fuels in the DHV record. Report this record even if only one fuel was combusted during the hour.

For non-Acid Rain NO<sub>x</sub> Budget Program units that use NO<sub>x</sub> concentration times stack flow as the primary methodology to calculate NO<sub>x</sub> mass emissions, report the hourly heat input rate unless you are specifically exempted (e.g., by a State SIP) from reporting it for allocation purposes. However, you must report unit operating time and load (except for non load-based units) for each hour in the HOURLY OPERATING DATA record, even if you are not required to report hourly heat input.

If, for any operating hour, the heat input rate is calculated to be less than one mmBtu/hr, substitute for that hour a value of one mmBtu/hr. Use an MODC of “26” for any such hours. This applies only to monitoring locations where CEMS are installed (i.e., where HI Rate is calculated using equation F-15, F-16, F-17, or F-18.) This does not apply to HI Rate calculated through Appendix D or apportionment.

In the rare event no units attached to the common stack generated load (Load = 0) during the hour, heat input should be apportioned by operating time.

#### Total Heat Input (HIT) (mmBtu)

Report this value in mmBtu for LME units and to the appropriate number of decimal places per Table 25.

#### LME Units

Report the value for each required parameter as total mass (or heat input) for the hour. Report each value to the appropriate number of decimal places per Table 25.

**Table 25: Precision of Reported Values for Derived Hourly Value Data**

Parameter Codes		Required Precision
CO2, CO2C, CO2M, H2O, HI, HIT, NOX, NOXM, SO2M		One decimal place
SO2	For CEM and Appendix D burning only oil during hour	One decimal place
SO2	Appendix D burning any gas during hour	Four decimal places
NOXR		Three decimal places

#### **MODC Code (MODCCode)**

For CEM methods for parameters CO2C, NOXR or H2O, report one of the following MODCs as shown in Table 26 to identify the monitoring system or missing data procedure used to report the derived value or when you were directed to report it for an approved alternative monitoring system. For parameter HI, use an MODC of “26” when the calculated Heat Input Rate is zero or negative and was therefore replaced with a value of 1.0. Report an MODC of “40” for parameter H2O when a fuel-specific or pro-rated default value is used in determining the derived value.

For all other parameters, leave this field blank.

**NO<sub>x</sub> Hourly Emission Rate**

Report an MODC of “14” when the diluent cap value for CO<sub>2</sub> or O<sub>2</sub> is used in place of the measured value reported in the MHV records. Also, be sure that you register the appropriate diluent cap value for the unit in the MONITORING DEFAULT DATA record in the monitoring plan. A diluent cap value can only be used for calculating NO<sub>x</sub> emission rate during operating hours for which a quality-assured measured diluent (CO<sub>2</sub> or O<sub>2</sub>) value is obtained.

For full-scale exceedances of a NO<sub>x</sub> analyzer, EPA requires reporting of an MODC reflecting the monitoring system in use during the exceedance, or reporting an MODC of “25” if the diluent concentration normally reported in the MHV records is not quality-assured. Therefore, during full-scale exceedances, when 200 percent of MPC or 200 percent of range is reported for NO<sub>x</sub> concentration in the MHV record and is used in conjunction with a quality-assured diluent gas concentration to calculate the NO<sub>x</sub> emission rate, report the MODC code associated with the monitoring system that is in use at the time of the full-scale exceedance (for example, report “01” if the primary NO<sub>x</sub>-diluent monitoring system is in use). If a full-scale exceedance of the NO<sub>x</sub> analyzer occurs and no quality-assured diluent gas concentration for the hour is available, report an MODC of “25” for that hour. Manual entry of an MODC of “21” is permitted.

**Table 26: MODC Codes and Descriptions for *DHV***

Code	Parameter(s)	Description
01	CO2C, NOXR, H2O	Primary Monitoring System (and Primary Bypass (PB) for NOXR)
02	CO2C, NOXR, H2O	Redundant Backup or Regular Non-Redundant Backup Monitoring System
03	All	Approved Part 75 Alternative Monitoring System
04	CO2C, NOXR, H2O	Reference Method Backup System
05	NOXR	Part 75 Approved Parametric Method for Controlled Units
06	CO2C, NOXR, H2O	Average Hour Before/Hour After
07	CO2C, NOXR, H2O	Initial Missing Data (§75.31)
08	CO2C, NOXR	90 <sup>th</sup> Percentile Value in Lookback Period (CO2C) <u>or</u> 90 <sup>th</sup> Percentile Value in Lookback Period in Corresponding Load Bin (NOXR)
	H2O	90 <sup>th</sup> <u>or</u> 10 <sup>th</sup> Percentile Value in Load Range in Lookback Period
09	CO2C, NOXR	95 <sup>th</sup> Percentile Value in Lookback Period (CO2C) <u>or</u> 95 <sup>th</sup> Percentile Value in Lookback Period in Corresponding Load Bin (NOXR)
	H2O	95 <sup>th</sup> <u>or</u> 5 <sup>th</sup> Percentile Value in Load Range in Lookback Period
10	CO2C, NOXR	Maximum Hourly Value in Lookback Period (CO2C) <u>or</u> Maximum Value in Lookback Period in Corresponding Load Bin (NOXR)
	H2O	Maximum or Minimum Hourly Moisture Percentage in Lookback Period
11	NOXR	Average Hourly Rate in Load Range in Lookback Period

Code	Parameter(s)	Description
12	CO2C, NOXR	Maximum Potential Concentration or Emission Rate
	H2O	Maximum or Minimum Potential Moisture Percentage
13	NOXR	Maximum Controlled NO <sub>x</sub> Emission Rate (MCR)
14	NOXR	Diluent Cap (if the cap is replacing a CO <sub>2</sub> measurement, it should be 5.0 percent for boilers and 1.0 percent for turbines; if it is replacing an O <sub>2</sub> measurement, it should be 14.0 percent for boilers and 19.0 percent for turbines.)
15	NOXR	1.25 times the maximum controlled NO <sub>x</sub> Emission Rate at the corresponding load or operational bin, in the applicable lookback
21	CO2C, H2O NOXR	A negative hourly value replaced with a zero
22	NOXR	NO <sub>x</sub> Emission Rate calculated from a certified NO <sub>x</sub> monitor at the control device inlet, when the outlet NO <sub>x</sub> monitor is unavailable and proper operation of the emission controls is not verified. These hours are included in missing data lookback and are treated as available hours for percent availability calculations.
23	NOXR	Maximum Potential NO <sub>x</sub> Emission Rate (MER) for an hour in which flue gases are discharged through an unmonitored bypass stack
24	NOXR	MCR for an hour in which flue gases are discharged downstream of the NO <sub>x</sub> emission controls through an unmonitored bypass stack, and the add-on NO <sub>x</sub> emission controls are confirmed to be operating properly
25	NOXR	MER. Use only when a NO <sub>x</sub> concentration full-scale exceedance occurs and the diluent monitor is unavailable.
26	HI	One mmBtu/hr substituted for Heat Input Rate for an operating hour in which the calculated Heat Input Rate is zero or negative
40	H2O	Fuel-Specific or Pro-Rated moisture default value
45	HIT	Maximum Rated Hourly Heat Input Rate (used to determine heat input for LME units generally using long-term fuel flow method)
53	All	Other quality-assured methodologies approved through petition. These hours are included in the missing data lookback and are treated as available hours for percent monitor availability calculations.
54	All	Other quality-assured methodologies approved through petition by EPA. These hours are included in missing data lookback and are treated as available hours for percent availability calculations.
55	All	Other substitute data approved through petition by EPA. These hours are <u>not</u> included in missing data lookback and are treated as unavailable hours for percent availability calculations.

\* EPA has reserved MODCs “01” through “55.” MODCs “56” through “99” may be used by vendors and companies for other purposes; do not report these codes in a quarterly report. MODCs “30” and “31” were defined in EDR v2.0 for Ozone Trading Commission (OTC) NBP units only and are no longer allowed.

### Monitoring System ID (*MonitoringSystemID*)

Report the Monitoring System ID for the appropriate monitoring system that is providing quality-assured data for the hour. For missing data hours, report the Monitoring System ID for the

appropriate monitoring system that is unable to provide quality assured data for the hour. For hours in which the flue gases are discharged through an unmonitored bypass stack, leave this field blank. Also, leave this field blank for the calculated SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> hourly mass emission rates.

If either: (1) a default high range NO<sub>x</sub> concentration value of 200 percent of the MPC is reported due to a full-scale exceedance of the low range; or (2) a value of 200 percent of the range is reported during a full-scale exceedance of the high range, report the ID number of the NO<sub>x</sub>-diluent monitoring system which is in use at the time of the full-scale exceedance.

For heat input records, report the Monitoring System ID for the O<sub>2</sub> or CO<sub>2</sub> system that provided the value used in the calculation. Table 27 below summarizes these requirements.

**Table 27: System ID Reporting for Derived Hourly Values**

Parameter Code	Description	System ID to Report
CO2	CO <sub>2</sub> Hourly Mass Rate	Leave blank
CO2C	CO <sub>2</sub> Concentration (from an O <sub>2</sub> monitor)	CO <sub>2</sub> System ID
H2O	Moisture (from wet/dry H <sub>2</sub> O system)	H <sub>2</sub> O System ID
HI	Heat Input	CO <sub>2</sub> or O <sub>2</sub> System ID if CEM. Otherwise, leave blank.
NOX	NO <sub>x</sub> Hourly Mass Rate from NO <sub>x</sub> Concentration and Stack Flow	Leave blank
	NO <sub>x</sub> Hourly Mass Rate from NO <sub>x</sub> Emissions Rate and Heat Input	Leave blank
NOXR	NO <sub>x</sub> Emissions Rate	NO <sub>x</sub> System ID for CEM system or NOXE System ID for Appendix E mixed-fuel curve. Otherwise, leave blank.
SO2	SO <sub>2</sub> Hourly Mass Rate	Leave blank

#### **Formula Identifier** (*FormulaIdentifier*)

Report the Formula ID from the MONITOR FORMULA DATA record that is used for the calculation of the parameter. Leave this field blank for missing data hours (except for parameter codes CO2C (CO<sub>2</sub> concentration determined from O<sub>2</sub> readings), H<sub>2</sub>O (determined from wet and dry O<sub>2</sub> readings), and NOXR) and for LME records. If you are using the Appendix D methodology to determine SO<sub>2</sub>, CO<sub>2</sub>, or Heat Input and burning multiple fuels for the hour, report the Formula ID from the MONITOR FORMULA DATA record with Formula Code D-12, G-4A, or D-15A respectively. If burning a single fuel for the hour, leave this field blank. If using multiple Appendix E curves to determine the NO<sub>x</sub> emission rate for the hour, report the Formula ID from the MONITOR FORMULA DATA record with Formula Code E-2. If using a single curve for the hour, leave this field blank.

**Percent Available** (*PercentAvailable*)

For NOXR from a CEM system, H<sub>2</sub>O, or CO<sub>2</sub>C, report the percent monitor data availability (PMA) to one decimal place for all hours. Do not report PMA for Heat Input Rate, SO<sub>2</sub>, NO<sub>x</sub>, or CO<sub>2</sub> hourly mass emission rates.

**Operating Condition Code** (*OperatingConditionCode*)

This field applies only to Appendix E NOXR data, LME NOXM data. For an Appendix E NO<sub>x</sub> emission rate record (for a unit using one correlation curve for a consistent fuel mixture), report the appropriate code from Table 28 below to indicate the condition that was used to determine the NO<sub>x</sub> emission rate for the hour.

See the instructions for this field in the HOURLY PARAMETER FUEL FLOW DATA record for details about when to report each operating condition code.

**Table 28: Operating Condition Codes and Descriptions for *DHV***

Code	Description
B	Unit operated at base load or set point temperature (LME)
C	Controls Operating Properly (LME)
E	Emergency Fuel (Appendix E)
M	Correlation Curve for the Fuel Mixture has Expired (Appendix E)
N	Operating Parameter is Outside of Normal Limits (Appendix E)
P	Unit operated at peak load or higher internal operating temperature (LME)
U	Uncontrolled Hour (Appendix E or LME)
W	Operation Above Highest Tested Heat Input Rate Point on the Curve (Appendix E)
X	Operating Parameter Data Missing or Invalid (Appendix E)
Y	Designated Operational and Control Equipment Parameters within Normal Limits (Appendix E)
Z	Operation Below Lowest Tested Heat Input Rate Point on the Curve (Appendix E)

In the NOXM record for an LME unit that uses a fuel- and unit-specific default NO<sub>x</sub> emission rate and has NO<sub>x</sub> controls, indicate the status of the NO<sub>x</sub> controls for the hour by reporting:

C = Controls Operating Properly

U = Unit Controls Not Operating or Not Operating Properly

In the NOXM record for an LME combustion turbine that operates principally at base load (or at a set point temperature) but is capable of operating at a higher peak load (or higher internal operating temperature), indicate for each operating hour whether operation was a base load (B) or peak load (P).



- B = Unit operated at base load or set point temperature  
 P = Unit operated at peak load or higher internal operating temperature

For all other records, leave this field blank.

**Segment Number** (*SegmentNumber*)

For an Appendix E NO<sub>x</sub> Emission Rate record (for a unit using one correlation curve for a consistent fuel mixture), report the Segment Number (1 – 4) indicating which portion of the correlation curve was used to determine the value for the hour. For operating condition codes N or X, report the segment number that contains the highest NO<sub>x</sub> emission rate on the curve for the fuel. Leave this field blank if the correlation curve was not used for the hour (i.e., the Operating Condition Code is E, M, U, or W).

**Fuel Code** (*FuelCode*)

For LME units, report the type of fuel combusted in the hour. If multiple fuels are burned, report the fuel type used to determine the mass emissions for the parameter in this record (i.e., the fuel with the highest emission factor for the parameter). If records are missing as to which fuel was burned in the hour, report the fuel with the highest emission factor for this parameter of all of the fuels capable of being burned in the unit.

**Table 29: Fuel Codes and Descriptions**

Code	Description
BFG	Blast Furnace Gas
BUT	Butane (if measured as a gas)
CDG	Coal-Derived Gas
COG	Coke Oven Gas
DGG	Digester Gas
DSL	Diesel Oil
LFG	Landfill Gas
LPG	Liquefied Petroleum Gas
NNG	Natural Gas (as defined in §72.2)
OGS	Other Gas
OIL	Residual Oil
OOL	Other Oil
PDG	Producer Gas
PNG	Pipeline Natural Gas (as defined in §72.2)
PRG	Process Gas
PRP	Propane (if measured as a gas)
RFG	Refinery Gas
SRG	Unrefined Sour Gas

## 2.5.2.1 MATS Derived Hourly Value Data

### MATS Derived Hourly Value Data Overview

If your EGU is subject to the MATS Rule (40 CFR Part 63, Subpart UUUUU), submit a MATS DERIVED HOURLY VALUE DATA (MDHV) record for each calculated (derived) parameter value determined at the monitoring location for each operating hour. MATS derived hourly values include electrical output-based emission rates for SO<sub>2</sub>, Hg, HCl, or HF, and heat input-based emission rates for SO<sub>2</sub>, Hg, HCl, or HF. Reporting instructions for each of the derived parameters are presented below.

#### **Derived SO<sub>2</sub> Hourly Emission Rates**

If you seek to comply with the acid gas emissions reduction requirements of the MATS rule by continuously monitoring the heat input-based or electrical output-based SO<sub>2</sub> emission rate as a surrogate for HCl, you must calculate and report the hourly SO<sub>2</sub> emission rate in the appropriate units of measure (see Table 30) for each operating hour in which valid values are reported for the unadjusted SO<sub>2</sub> concentration and all of the auxiliary parameters that are needed to calculate the SO<sub>2</sub> emission rate.

For the electrical output-based emission rate, the auxiliary parameters needed to convert the SO<sub>2</sub> concentration to lb/MWh include stack gas flow rate, gross electrical load, and (if applicable) stack gas moisture content. For the heat input-based emission rate, the auxiliary parameters needed to convert the SO<sub>2</sub> concentration to lb/mmBtu include diluent gas (CO<sub>2</sub> or O<sub>2</sub>) concentration and (if applicable) stack gas moisture content.

Use only quality-assured, unadjusted hourly average SO<sub>2</sub> concentrations, stack gas flow rates, diluent gas concentrations, and (if applicable) moisture values to calculate the SO<sub>2</sub> emission rates. Do not calculate the hourly SO<sub>2</sub> emission rate if Part 75 substitute data is used for any of the auxiliary parameters. Also, do not calculate the electrical output-based emission rate if the electrical load for the operating hour is missing. When the electrical load is zero, report the “default electrical load” (as defined in §63.10042). The default electrical load is not considered to be substitute data.

For the purposes of the MATS rule, the hourly SO<sub>2</sub> emission rate (lb/mmBtu or lb/MWh) must not be calculated for any operating hour in which SO<sub>2</sub> concentration exceeds the low range of a dual-range SO<sub>2</sub> monitor and the high range is unable to provide quality-assured data due to an expired linearity check or an expired daily calibration error test. Whereas the Acid Rain Program and other programs that use Part 75 to monitor SO<sub>2</sub> mass emissions require a substitute data value (specifically, the maximum potential SO<sub>2</sub> concentration (MPC)) to be reported and used in the emissions calculations for such hours, the MATS rule prohibits Part 75 substitute data values from being used to calculate hourly pollutant emission rates. Note that default moisture percentages from Part 75 (if used) are not considered to be substitute data values. If the diluent cap is used in the calculation of the heat input-based emissions rate, the cap value is not considered to be substitute data.

For operating hours in which quality-assured data are not obtained for either the unadjusted SO<sub>2</sub> concentration or any essential auxiliary parameter(s), report a MDHV record, even though the SO<sub>2</sub> emission rate is not calculated for those hours (see the reporting instructions below for the “Unadjusted Hourly Value” field).

**Derived Hourly Hg, HCl, or HF Emission Rates**

If you seek to comply with the MATS rule by continuously monitoring the heat input-based or electrical output-based Hg, HCl, or HF emission rate, you must calculate and report in a MDHV record the hourly pollutant emission rate in the appropriate units of measure (as shown in Table 30) for any operating hour in which sufficient valid data are obtained for the unadjusted Hg, HCl, or HF concentration, and for all other parameters needed to convert Hg, HCl, or HF concentration to the units of the emission standard (see 40 CFR 60.13(h)(2)).

For the electrical output-based emission rate, the auxiliary parameters needed to convert the Hg, HCl, or HF concentration to lb/GWh or lb/MWh (as applicable) include stack gas flow rate, gross electrical load, and (if applicable) stack gas moisture content. For the heat input-based emission rates, the auxiliary parameters needed to convert the Hg, HCl, or HF concentration to lb/TBtu or lb/mmBtu (as applicable) include diluent gas (CO<sub>2</sub> or O<sub>2</sub>) concentration and (if applicable) stack gas moisture content.

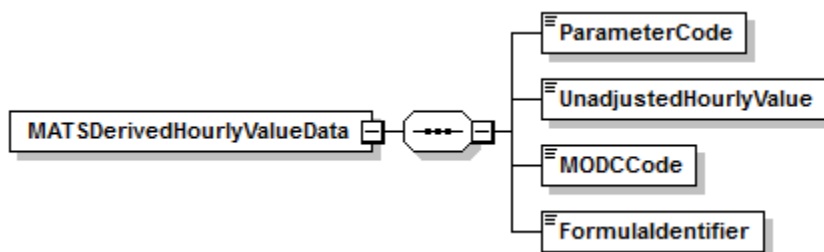
Use only quality-assured, unadjusted hourly average Hg, HCl, and HF concentrations, stack gas flow rates, diluent gas concentrations, and (if applicable) moisture values to calculate the Hg, HCl, or HF emission rates. Do not calculate the hourly emission rate if Part 75 substitute data is used for any of the auxiliary parameters. Also, do not calculate the electrical output-based emission rate if the electrical load for the operating hour is missing. For startup or shutdown hours, if the electrical load is zero, the output-based emission rate must be calculated using the “default electrical load” (as defined in §63.10042).

Note that default moisture percentages from Part 75 (if used) are not considered to be substitute data values. If the diluent cap is used in the calculation of the heat input-based emissions rate, the cap value is not considered to be substitute data.

For operating hours in which quality-assured data are not obtained for either the unadjusted pollutant concentration (i.e., Hg, HCl, or HF, as applicable) or any essential auxiliary parameter(s), report a MDHV record, even though the emission rate is not calculated for those hours (see the reporting instructions below for the “Unadjusted Hourly Value” field).

[MATS Derived Hourly Value Data XML Model](#)

**Figure 14: MATS Derived Hourly Value Data XML Elements**



[MATS Derived Hourly Value Data XML Elements](#)

**Parameter Code** (*ParameterCode*)

Report the appropriate Parameter Code as shown in Table 30:

**Table 30: Parameter Codes and Descriptions for the MDHV Data Record**

Code	Description
SO2RE	Electrical Output-Based Hourly SO <sub>2</sub> Emission Rate (lb/MWh)
SO2RH	Heat Input-Based Hourly SO <sub>2</sub> Emission Rate (lb/mmBtu)
HGRE	Hg Electrical Output Based Emissions Rate (lb/GWh)
HGRH	Hg Heat Input Based Emissions Rate (lb/TBtu)
HCLRE	HCl Electrical Output Based Emissions Rate (lb/MWh)
HCLRH	HCl Heat Input Based Emissions Rate (lb/mmBtu)
HFRE	HF Electrical Output Based Emissions Rate (lb/MWh)
HFRH	HF Heat Input Based Emissions Rate (lb/mmBtu)

**Unadjusted Hourly Value** (*UnadjustedHourlyValue*)

Report the unadjusted derived hourly value for the parameter specified, as follows:

SO<sub>2</sub> Emission Rates

If your EGU has a single unit-single stack exhaust configuration and you seek to comply with the acid gas emissions reduction requirements of the MATS rule by continuously monitoring either the heat input-based SO<sub>2</sub> emission rate (lb/mmBtu) or the electrical output-based SO<sub>2</sub> emission rate as a surrogate for HCl, report the unadjusted SO<sub>2</sub> emission rate in a MDHV record for each operating hour in which quality-assured values are obtained and reported in MHV records for the unadjusted SO<sub>2</sub> concentration and for all of the auxiliary parameters needed to convert the SO<sub>2</sub> concentration to lb/mmBtu or lb/MWh (as applicable). For the calculation of electrical output-based emission rates, use only unadjusted hourly SO<sub>2</sub> concentrations and stack gas flow rates—do not apply Part 75 bias adjustment factors to the SO<sub>2</sub> or flow rate data. Report the SO<sub>2</sub> emission rates ~~to three significant figures~~ using scientific notation, keeping only one leading non-zero digit to the left of the decimal point. For example, an SO<sub>2</sub> emission rate of 0.0756 lb/mmBtu would be reported as 7.56E-2, with no spaces in between the characters. Do not use “plus” characters after the “E” when reporting rates greater than or equal to one. For example, an SO<sub>2</sub> emission rate of 7.56 lb/mmBtu would be reported as 7.56E0. For data prior to September 9, 2020, report the rate in scientific notation rounded to three significant figures. For example, if the rate is 0.159 lb/mmBtu, report 1.59E-1.

Use appropriate equations from Table 28 of the ECMPS Monitoring Plan Reporting Instructions to determine the hourly lb/mmBtu or lb/MWh SO<sub>2</sub> emission rate. These equations must be defined in your electronic monitoring plan.

If the SO<sub>2</sub> concentration or any auxiliary parameter needed to calculate the SO<sub>2</sub> emission rate is either invalid or is a substitute data value, leave this field blank and report an MODC of “38.”

If you seek to comply with the electrical output-based standard and the hourly electrical load is zero during unit operation, and all other essential parameters are valid, calculate the emission rate

using the default electrical load and report an MODC of “39.” If the electrical load is missing during unit operation, leave this field blank and report an MODC of “38.”

If your affected EGU has a common stack or multiple stack exhaust configuration, see the “Specific Considerations for the MATS Rule” presented at the end of this section.

#### Hg, HCl, or HF Emission Rates

If your EGU has a single unit-single stack exhaust configuration and you seek to comply with the MATS rule by continuously monitoring either the heat input-based Hg, HCl, or HF emission rate (lb/TBtu or lb/mmBtu, as applicable) or the electrical output-based emission rate (lb/GWh or lb/MWh, as applicable), report the Hg, HCl, or HF emission rate in a MDHV record for each operating hour in which valid data are obtained and reported for the unadjusted Hg, HCl, or HF concentration (in a MMHV record) and for all of the auxiliary parameters needed to convert the pollutant concentration to the units of the emission standard (in MHV records). For the calculation of electrical output-based emission rates, use only unadjusted hourly stack gas flow rates—do not apply Part 75 bias adjustment factors to the flow rate data. Report the Hg, HCl, or HF emission rates ~~to three significant figures~~ using scientific notation, keeping only one leading non-zero digit to the left of the decimal point. For example, an Hg emission rate of 0.000385 lb/GWh would be reported as “3.985E-4” with no spaces in between characters and the “E” capitalized. Do not use “plus” characters after the “E” when reporting rates greater than or equal to one. For example, an Hg emission rate of 3.85 lb/GWh would be reported as “3.985E0.” For data prior to September 9, 2020, report the rate in scientific notation rounded to three significant figures. For example, if the rate is 0.159 lb/GWh, report 1.59E-1.

Use appropriate equations from Table 33, 35, or 37 (as applicable) of the ECMPS Monitoring Plan Reporting Instructions to determine the hourly lb/mmBtu or lb/MWh Hg, HCl, or HF emission rate. These equations must be defined in your electronic monitoring plan.

If the Hg, HCl, or HF concentration or any auxiliary parameter needed to calculate the pollutant emission rate is either invalid or is a substitute data value, leave this field blank and report an MODC of “38.”

If you seek to comply with the electrical output-based standard and the hourly electrical load is zero during unit operation, and all other essential parameters are valid, calculate the emission rate using the default electrical load and report an MODC of “39.” If the electrical load is missing during unit operation, leave this field blank and report an MODC of “38.”

If your affected EGU has a common stack or multiple stack exhaust configuration, see the “Specific Considerations for the MATS Rule” presented at the end of this section.

#### **MODC Code (MODCCode)**

For parameters HGRE, HGRH, HCLRE, HCLRH, HFRE, HFRH, SO2RE, or SO2RH, report an MODC of “36,” “37,” or “39” (as appropriate) for hours in which the emission rate is able to be calculated, and report “38” for hours in which the emission rate cannot be calculated. Entry of MODCs 36, 37, 38 and 39 is permitted.

For all other parameters, leave this field blank.

**Table 31: MODC Codes and Descriptions for MDHV**

Code	Parameter(s)	Description
36	HGRE, HGRH, HCLRE, HCLRH, HFRE, HFRH, SO2RE, SO2RH	Hourly Hg, HCl, SO <sub>2</sub> , or HF emission rate calculated—valid data obtained for pollutant concentration and for all essential auxiliary parameters
37	HGRH, HCLRH, HFRH, SO2RH,	Hourly heat input-based Hg, HCl, SO <sub>2</sub> , or HF emission rate calculated for a startup or shutdown hour, using the diluent cap value
38	HGRE, HGRH, HCLRE, HCLRH, HFRE, HFRH, SO2RE, SO2RH	Hourly Hg, HCl, or HF emission rate not calculated—valid concentration not available or one or more essential auxiliary parameters is either missing or reported as substitute data.
39	HGRE, HCLRE, HFRE, SO2RE	Hourly electric output-based Hg, HCl, SO <sub>2</sub> , or HF emission rate calculated using the default electrical load value for a startup or shutdown hour where there is heat input to an affected EGU but zero gross output.

**Formula Identifier** (*FormulaIdentifier*)

Report the Formula ID from the MONITOR FORMULA DATA record that is used for the calculation of the parameter.

For operating hours in which the heat input-based Hg, SO<sub>2</sub>, HCl, or HF emission rate is calculated and for operating hours when the emission rate is not calculated, report the formula ID corresponding to the EPA Method 19 equation used. For operating hours in which the electrical output-based Hg, SO<sub>2</sub>, HCl, or HF emission rate is calculated and for operating hours when the emission rate is not calculated, report the formula ID corresponding (as applicable) to either Equation A-2 or A-3 from Table 33 of the ECMPS Monitoring Plan Reporting Instructions (for Hg), Equation S-2 or S-3 from Table 29 (for SO<sub>2</sub>), Equation HC-2 or HC-3 from Table 35 (for HCl), or Equation HF-2 or HF-3 from Table 37 (for HF).

**Specific Considerations****Specific Considerations for the MATS Rule**

- For EGUs subject to the MATS Rule that have common stack configurations, you may monitor emissions concentration and the necessary auxiliary parameters at the common stack provided that all of the units sharing the stack are subject to the same emission limit (see 40 CFR 63.8(b)(2)(i)). If this monitoring option is implemented, do not apportion the hourly emission rate measured at the common stack to the individual units (i.e., do not report any additional MATS DERIVED HOURLY VALUE DATA records under the ID numbers of the units that share the common stack). However, if the units sharing the common stack are not subject to the same emission standard, you must either monitor the units individually to demonstrate compliance with the emission limits or monitor at the common stack and demonstrate compliance with the most stringent emission limit.

- If, for a particular unit, hourly emissions rates are monitored at multiple stacks (or ducts) report the hourly emission rate measured at each stack (or duct) and an hourly flow-weighted emission rate for the unit (i.e., report both stack (or duct)-level and unit-level MATS DERIVED HOURLY VALUE DATA records). Use Equation MS-1 to calculate the hourly unit-level emission rates:

$$E_h = \frac{\sum_{i=1}^n (ER)_i (Q)_i}{\sum_{i=1}^n (Q)_i}$$

(Equation MS-1)

Where:

- $E_h$  = Flow-weighted hourly average pollutant emission rate for the EGU (lb/mmBtu, lb/TBtu, lb/MWh, or lb/GWh, as appropriate)
- $ER$  = Hourly average pollutant emission rate measured in the monitored stack or duct (lb/mmBtu, lb/TBtu, lb/MWh, or lb/GWh, as appropriate)
- $Q$  = Hourly stack gas flow rate measured in the monitored stack or duct (scfh, wet basis)
- $i$  = Designation for a particular stack or duct
- $n$  = Total number of monitored stacks or ducts

- If quality-assured data are not obtained for the unadjusted pollutant concentration (i.e., Hg, HCl, HF, or SO<sub>2</sub>, as applicable) and/or for any essential auxiliary parameter(s) at a particular monitored stack or duct, do not calculate the emission rate at that location and leave the “Unadjusted Hourly Value” field blank. Do not calculate the unit-level emission rate for any operating hour in which a valid emission rate is not able to be calculated for all of the stacks (or ducts).
- For common stack configurations, if you elect to comply with an electrical output-based standard, then, for hours in which all units that are operating in startup or shutdown mode and the combined electrical load is zero, provided that all other parameters used in the emission rate equation are valid, you must calculate the pollutant emission rate using the default electrical load (as defined in §63.10042). The default electrical load is not reported if any unit that shares the stack is operating normally while another unit(s) is in startup or shutdown mode.

## 2.5.3 Hourly Fuel Flow Data

### Hourly Fuel Flow Data Overview

Whenever a flowmeter is used to determine heat input rate or SO<sub>2</sub> or CO<sub>2</sub> emissions in accordance with Appendix D, report an HOURLY FUEL FLOW DATA (HFF) record for each type of oil and/or gaseous fuel combusted during each operating hour using the Monitoring System ID associated with the appropriate flowmeter monitoring system. Do not report an HFF record for low mass emissions units (LME) that use a certified Appendix D fuel flowmeter for long term fuel flow purposes; use the LONG TERM FUEL FLOW (LTFF) record.

To report hourly SO<sub>2</sub> mass emission rate, CO<sub>2</sub> mass emission rate and/or Heat Input, you must also submit the appropriate HOURLY PARAMETER FUEL FLOW DATA records associated with each HFF record.

If you measure fuel flow at a common pipe location, report a HFF record using the Stack Pipe ID for each hour in which fuel is combusted by a unit served by the common pipe. Do not report HFF records for the individual units on an hourly basis. Apportion the heat input rate calculated at the common pipe location to each unit, using appropriate time-weighted apportionment formulas based on load (see Appendix F and the MONITOR FORMULA DATA instructions). Report the apportioned hourly heat input rate values in separate DERIVED HOURLY VALUE DATA (DHV) records for the individual units. Use the hourly heat input rates and operating times from the DHV records to calculate the cumulative heat input values for each unit and report these values in unit-level SUMMARY VALUE DATA records. If you use uncertified fuel flowmeters at the unit and Equation F-21D to apportion the common pipe heat input to the individual units, report HFF only for the common pipe -- do not report any HFF records showing the fuel flow to the individual units.

#### **For Oil Fuel Flow Records**

Report an HFF for any hour in which oil is combusted as a startup fuel and fuel flow is estimated through tank measurements.

The oil flow rate is the net fuel flow rate to the unit(s). For example, it may represent the difference between the values measured for the main supply and re-circulating oil lines or it may represent the sum of oil flow for two fuel flowmeters measuring the same type of oil to the unit.

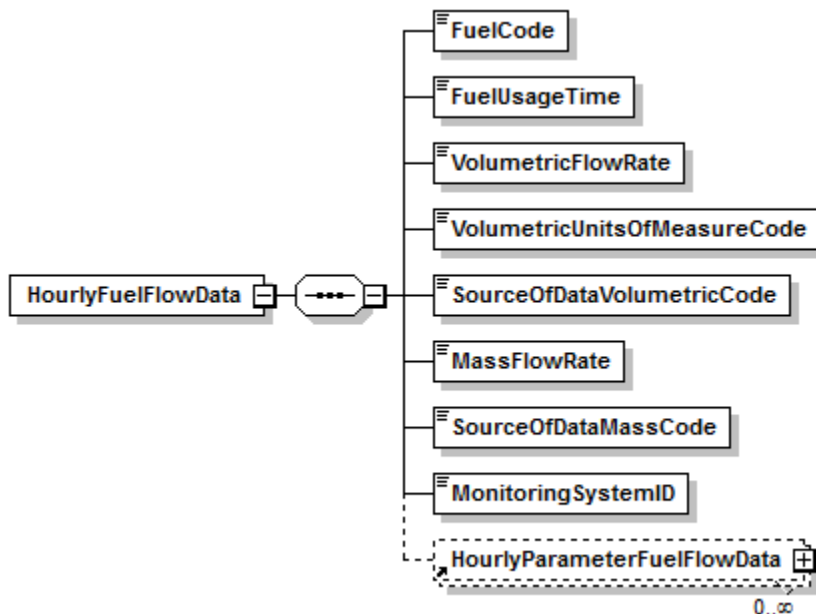
For oil fuel flow systems, if the fuel flow system measures mass flow rate of oil directly, leave blank the following data elements:

- Volumetric Flow Rate
- Volumetric Units of Measure Code
- Source of Data Volumetric Code



Hourly Fuel Flow Data XML Model

**Figure 15: Hourly Fuel Flow Data XML Elements**



Hourly Fuel Flow Data XML Elements

**Fuel Code (*FuelCode*)**

Report the type of oil or gaseous fuel combusted during the hour for the system. For oil fuels use the general fuel type codes provided in Table 32 below. For gaseous fuels, you may either report the type of fuel using the General Fuel Type codes (which are consistent with the codes used in the UNIT FUEL DATA record in the monitoring plan) or report more specific fuel codes for the type of gas combusted using one of the Specific Fuel Type codes. Both sets of fuel type codes are listed in Table 33 below. The Fuel Code should match the Fuel Code in the MONITORING SYSTEM DATA record associated with the Monitoring System ID.

For Oil Fuel Flow Records

**Table 32: Oil Fuel Flow Fuel Codes and Descriptions**

Code	Description
DSL	Diesel Oil
OIL	Residual Oil
OOL	Other Oil

For Gas Fuel Flow Records**Table 33: Gas Fuel Flow Fuel Codes and Descriptions**

Code	Description
<b>General Fuel Type Codes</b>	
LPG	Liquefied Petroleum Gas (if measured as a gas)
NNG	Natural Gas
OGS	Other Gas
PNG	Pipeline Natural Gas (as defined in §72.2)
PRG	Process Gas
<b>Specific Fuel Type Codes</b>	
BFG	Blast Furnace Gas
BUT	Butane (if measured as a gas)
CDG	Coal-Derived Gas
COG	Coke Oven Gas
DGG	Digester Gas
LFG	Landfill Gas
PDG	Producer Gas
PRP	Propane (if measured as a gas)
RFG	Refinery Gas
SRG	Unrefined Sour Gas

**Fuel Usage Time** (*FuelUsageTime*)

Report the fraction of the clock hour during which the unit combusted the specified fuel. You may use any equal increments from hundredths (0.01 hr) to quarters (0.25 hr) of an hour. Do not leave this field blank.

For common pipes, report the cumulative portion of the hour during which the specified fuel was combusted in any of the units served by the common pipe, not to exceed a fuel usage time of 1.00. For example, if a common pipe serves Units 1 and 2 and both units operate for the first 24 minutes (0.40 hr) of the hour and then are both shut down, the fuel usage time is 0.40. If Unit 1 operates only for the first 24 minutes of the hour and Unit 2 operates only for the last 24 minutes of the hour, the fuel usage time is 0.40 hr plus 0.40 hr, or 0.80. If Unit 1 operates for the first 40 minutes of the hour and Unit 2 operates for the last 40 minutes of the hour, report a fuel usage time of 1.00, since for all minutes in the hour, at least one of the units operated.

**Volumetric Flow Rate** (*VolumetricFlowRate*)For Oil Fuel Flow Records

If the fuel flow system measures the volumetric flow rate of oil, report the net volumetric flow rate, as measured, rounded to one decimal place. This value represents an hourly rate for periods in

which the fuel is combusted, not a total flow for the hour. If the hourly oil flow rate is so small that it results in a heat input rate of 0.0 mmBtu/hr (rounded to the nearest tenth) when Equation D-8 is used, you may report, as a default value, the minimum oil flow rate that will give a heat input rate greater than zero. This minimum oil flow rate must be defined in the MONITOR DEFAULT DATA record in the monitoring plan.

For units using Appendix D to account for SO<sub>2</sub> mass emissions you must report mass flow rate. If you use a volumetric flowmeter, report the volumetric flow rate in this field, the mass oil flow rate in the Mass Flow Rate field, and the density value used for the conversion in an HOURLY PARAMETER FUEL FLOW record. If the fuel flow system measures mass flow rate of oil directly, leave this field blank.

#### For Gas Fuel Flow Records

For Appendix D gas systems, the flow rate of gas is measured hourly by the fuel flowmeter system. The flow rate is the net fuel flow rate to the unit(s). For example, it may represent the sum of the gas flow rates for two fuel flowmeters measuring gas to the unit. All values must be reported in 100 standard cubic feet per hour (100 scfh) rounded to one decimal place. This value represents an hourly rate for periods in which the fuel is combusted, not a total flow for the hour. If the hourly gas flow rate is so small that it results in a heat input rate of 0.0 mmBtu/hr (rounded to the nearest tenth) when Equation D-6 is used, you may report, as a default value, the minimum gas flow rate that will give a heat input rate greater than zero. This minimum gas flow rate must be defined in the MONITORING DEFAULT DATA record in the monitoring plan.

#### **Volumetric Units of Measure Code** (*VolumetricUnitsOfMeasureCode*)

Report the units of measure used to report volumetric flow rate using the appropriate code from Table 34.

**Table 34: Volumetric Units of Measure Codes and Descriptions**

Fuel Type	Units of Measure Code	Description
Oil	BBLHR	Barrels/Hour
	GALHR	Gallons/Hour
	M3HR	Cubic Meters/Hour
	SCFH	Standard Cubic Feet/Hour
Gas	HSCF	100 Standard Cubic Feet/Hour

Leave this field blank only for Oil HFF records, where the fuel flow system measures mass flow rate of oil directly.

#### **Source of Data Volumetric Code** (*SourceOfDataVolumetricCode*)

Report the Source of Data Volumetric Code that indicates the type of value reported for gas flow or volumetric oil flow rate, as shown in Table 35.

**Table 35: Source of Data Volumetric Codes and Descriptions**

Code	Fuel Type	Description
0	Oil or Gas	Measured Data
1	Oil or Gas	Substitute Data Using Lookback Procedures
3	Oil or Gas	Maximum Potential Fuel Flow Rate (simplified missing data procedure for peaking units, only)
4	Oil or Gas	Emergency Fuel (maximum unit fuel flow rate)
5	Oil	Igniter Oil from Tank Measurements
6	Oil	Uncertified OFFM to Measure Igniter Oil
9	Oil or Gas	Default Minimum Fuel Flow Rate

Leave this field blank only for Oil HFF records, where the fuel flow system measures mass flow rate of oil directly.

Do not leave this field blank for gas fuel flow records.

### **Mass Flow Rate** (*MassFlowRate*)

#### For Oil Fuel Flow Records

Report the Mass Flow Rate of oil either measured directly by a fuel flowmeter system or calculated from the volumetric flow rate measured by a fuel flowmeter system. All values must be reported in lb/hr, rounded to one decimal place. This value represents an hourly rate for the period in which fuel is combusted, not total flow for the hour.

For units using Appendix D to account for SO<sub>2</sub> mass emissions, you must report mass flow rate in order to calculate SO<sub>2</sub> mass emissions. Where the density of the oil is determined by the applicable ASTM procedures referenced in Part 75, use Equation D-3 to calculate the mass flow rate of oil (in lb/hr).

$$OIL_{rate} = V_{oil-rate} \times D_{oil} \quad \text{(Equation D-3)}$$

Where:

- OIL<sub>rate</sub> = Mass rate of oil consumed per hr (lb/hr)
- V<sub>oil-rate</sub> = Volume rate of oil consumed per hr, measured in scfh, gal/hr, barrels/hr, or m<sup>3</sup>/hr (rounded to one decimal place)
- D<sub>oil</sub> = Density of oil, measured in lb/scf, lb/gal, lb/barrel, or lb/m<sup>3</sup>

However, for Subpart H units using Appendix D only for heat input determination, you may measure and report either mass flow rate or volumetric flow rate of oil. If you use volumetric flow rate and gross calorific value (GCV) to determine hourly heat input rate, leave this field blank.

For Gas Fuel Flow Records

Leave this field blank.

**Source of Data Mass Code** (*SourceOfDataMassCode*)For Oil Fuel Flow Records

Report one of the following codes to indicate the type of value reported for mass oil flow rate. If the mass oil flow value was calculated from a volumetric oil flow value, report code 2, regardless of what Source of Data code was reported for the volumetric oil flow. For emergency fuels where certified fuel flowmeters are used instead of the maximum unit fuel flow rate for heat input, use either code 0, 1, 2, or 3 as appropriate. Do not use code 4 unless the maximum unit fuel flow rate option is used for reporting heat input for the emergency fuel.

**Table 36: Source of Data Mass Codes and Descriptions**

Code	Description
0	*Measured Data (using a mass flowmeter)
1	Substitute Data Using Lookback Procedures
2	*Mass Flowrate Derived from Volumetric Value
3	Maximum Potential Fuel Flow Rate (simplified missing data procedure for peaking units, only)
4	Emergency Fuel (maximum unit fuel flow rate)
5	Igniter Oil from Tank Measurements
6	Uncertified OFFM to Measure Igniter Oil
9	Default Minimum Fuel Flow Rate

\* Including measured or derived mass data, for an emergency fuel where a certified mass or volumetric oil flowmeter is used.

Do not leave this field blank if fuel flow is reported in the MassFlowRate element.

**Monitoring System ID** (*MonitoringSystemID*)

Report the three character Monitoring System ID for the gas or oil fuel flowmeter system.

For hours in which you report the source of the fuel flow rate data (*SourceOfDataVolumetricCode* or *SourceOfDataMassCode* element) as codes 4, 5, or 6 for “Emergency Fuels,” where the maximum unit fuel flow rate is used, or as “Igniter Oil from Tank Measurements,” or “Uncertified OFFM to Measure Igniter Oil,” leave the Monitoring System ID blank.

### 2.5.3.1 Hourly Parameter Fuel Flow Data

#### Hourly Parameter Fuel Flow Data Overview

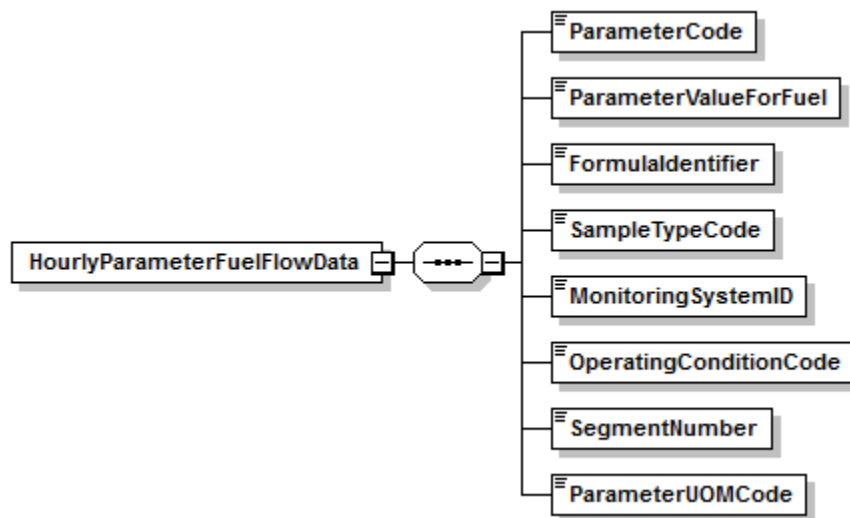
For each HOURLY FUEL FLOW DATA (HFF) record, submit HOURLY PARAMETER FUEL FLOW DATA records to provide the following information, as applicable:

- Gross calorific value (GCV) of the fuel;
- Density of the oil, if oil is measured on a volumetric basis and is required to be converted to a mass basis (for locations that report SO<sub>2</sub>);
- Sulfur content or default SO<sub>2</sub> emission rate for the fuel, for locations that report SO<sub>2</sub>;
- Hourly heat input rate and/or SO<sub>2</sub>, and CO<sub>2</sub> mass emission rate values, as calculated from the hourly fuel flow; and
- NO<sub>x</sub> emission rate determined using an Appendix E correlation curve for the single fuel.

Submit an HOURLY PARAMETER FUEL FLOW DATA record separately for each parameter as applicable. For units using Appendix D to account for heat input rate and SO<sub>2</sub> and CO<sub>2</sub> emissions, for each hour in which any type of oil or gas is burned, report an HOURLY PARAMETER FUEL FLOW DATA record and the corresponding HFF record(s) for each fuel combusted during the hour.

#### Hourly Parameter Fuel Flow Data XML Model

Figure 16: Hourly Parameter Fuel Flow Data XML Elements



#### Hourly Parameter Fuel Flow Data XML Elements

##### **Parameter Code** (*ParameterCode*)

Report the parameter for the HOURLY PARAMETER FUEL FLOW DATA record using one of the codes in Table 37:

**Table 37: Parameter Codes and Descriptions for Hourly Parameter Fuel Flow Data**

Code	Description
CO2	CO <sub>2</sub> Mass Emission Rate (tons/hr)
DENSOIL	Density of Oil
FC	Carbon-Based F-Factor (for CO <sub>2</sub> calculation)
GCV	Gross Calorific Value for Oil or Gas
HI	Heat Input Rate (mmBtu/hr)
NOXR	NO <sub>x</sub> Emission Rate (lb/mmBtu) (Appendix E)
SO2	SO <sub>2</sub> Hourly Mass Rate (lb/hr)
SO2R	Default SO <sub>2</sub> Emission Rate (lb/mmBtu)
SULFUR	Sulfur Content (percent by weight)

**Parameter Value for Fuel** (*ParameterValueForFuel*)

If the Parameter Code is “SO2,” report the SO<sub>2</sub> mass emission rate for the fuel in lb/hr calculated using Equation D-2, D-4, or D-5 from Appendix D to Part 75.

If the Parameter Code is “CO2,” report the CO<sub>2</sub> mass emission rate for the fuel in tons/hr calculated using Equation G-4 from Appendix G to Part 75.

If the Parameter Code is “HI,” report the Heat Input rate for the fuel calculated by multiplying the heat content (GCV) of the fuel by the hourly fuel flow rate. Report this value in units of mmBtu/hr.

If the Parameter Code is “NOXR,” report the NO<sub>x</sub> emission rate for the fuel in lb/mmBtu determined using an Appendix E correlation curve.

If the Parameter Code is “GCV,” report the gross calorific value used to calculate heat input. Be sure to use the units of measure that correspond to the units used to report the fuel flow.

If the Parameter Code is “DENSOIL,” report the density of oil used to calculate mass oil flow rate from volumetric oil flow rate. Be sure to use the units of measure that correspond to the units used to report the fuel flow.

If the Parameter Code is “FC” report the carbon based F-factor for this fuel, as used to calculate CO<sub>2</sub> using equation G-4.

If the Parameter Code is “SULFUR,” for oil fuel flow records, if percent sulfur is measured, the actual value may be reported to the appropriate number of decimal places in Table 38. Use Table D-4 in Appendix D to Part 75 to determine what value you should report in this field. For gas fuel flow records report the sulfur content of the gaseous sample in grains/100 scf. Use Table D-5 in Appendix D to Part 75 to determine the correct value. If the sulfur content for any sample(s) is 0.04 grains/100 scf or less, report 0.1 grains/100 scf.

If the Parameter Code is “SO2R,” report the default SO<sub>2</sub> emission rate for natural gas of 0.0006 lb/mmBtu for pipeline natural gas if pipeline natural gas is combusted. If calculating a default emission rate using Equation D-1H, report the default rate in this field.

For all parameter codes, report the value to the appropriate number of decimal places in Table 38.

**Table 38: Precision of Reported Values for Parameter Value for Fuel**

Parameter Codes		Number of Decimal Places
CO2, FC, GCV, HI		One
DENSOIL		Six
NOXR		Three
SO2	Oil	One
SO2	Gas	Five
SO2R		Five
SULFUR	Oil	Four
SULFUR	Gas	One

**Formula Identifier** (*FormulaIdentifier*)

Report the code corresponding to the formula listed in the monitoring plan used to calculate the parameter for the HOURLY PARAMETER FUEL FLOW DATA record. For parameters GCV, FC, DENSOIL, and SULFUR, leave this field blank. For parameter SO2R, report this field if using a D-1H formula, otherwise leave it blank.

**Sample Type Code** (*SampleTypeCode*)

Report the type of sample used to determine the GCV, density, or sulfur content using one of the codes in Table 39.

**Table 39: Sample Type Codes and Descriptions**

Code	Fuel	Parameters	Description
0	Gas	GCV, SULFUR	Actual Measured Hourly Average Sample from GCH
1	Oil	GCV, DENSOIL, SULFUR	Actual Measured Value from Oil Composite or Tank Sample
2	Gas	GCV, SULFUR	Actual Measured Value from a Daily Sample
	Oil	GCV, DENSOIL, SULFUR	
3	Gas	GCV	Actual Measured GCV from Most Recent Monthly Sampling
4	Gas	GCV, SULFUR	Actual Measured Value from Most Recent Shipment or Lot
5	Gas	SULFUR	Highest Daily Sample in 30 Daily Samples
	Oil	GCV, DENSOIL, SULFUR	



Code	Fuel	Parameters	Description
6	Gas	GCV, SULFUR	Highest Sampled Value in Previous Calendar Year (or a higher sampled value, superseding the assumed value)
	Oil	GCV, DENSOIL, SULFUR	
7	Gas	GCV, SULFUR	Maximum Value Allowed by Contract (or a higher sampled value, superseding the assumed value)
	Oil	GCV, DENSOIL, SULFUR	
8	Gas	GCV, SULFUR	Missing Data (Maximum Potential Value for missing data or emergency fuel from Table D-6 Appendix D section 2.4.1)
	Oil	GCV, DENSOIL, SULFUR	

### Monitoring System ID (*MonitoringSystemID*)

For Appendix E NO<sub>x</sub> rate records (Parameter NOXR), report the three-character Monitoring System ID for the applicable NOXE system. If there is no applicable NOXE system (e.g., for emergency fuel records) leave this field blank. Also leave this field blank for other parameters.

### Operating Condition Code (*OperatingConditionCode*)

For Appendix E NO<sub>x</sub> rate records (Parameter NOXR), report the appropriate code from Table 40 that indicates the condition that was used to determine the NO<sub>x</sub> emission rate for the hour.

**Table 40: Operating Condition Codes and Descriptions for *Hourly Parameter Fuel Flow***

Code	Description
E	Emergency Fuel or Ignition Fuel
M	Correlation Curve for the Fuel Mixture Has Expired
N	Operating Parameter Is Outside of Normal Limits
U	Uncontrolled Hour
W	Operation Above Highest Tested Heat Input Rate Point on the Curve
X	Operating Parameter Data Missing or Invalid
Y	Designated Operational and Control Equipment Parameters within Normal Limits
Z	Operation Below Lowest Tested Heat Input Rate Point on the Curve

### When to Report “E”

Report “E” if the unit burned an emergency or ignition fuel during the hour and you do not have a separate correlation curve for the emergency fuel. For these hours, report the fuel-specific maximum potential NO<sub>x</sub> emission rate (MER) in the *ParameterValueForFuel* field.

### When to Report “M”

When 20 calendar quarters have elapsed since the quarter of the last Appendix E test for a particular type of fuel, without a subsequent re-test being done, the correlation curve for that fuel type has expired. From that point on (i.e., starting with the first hour after the end of the 20th quarter), the previous correlation curve is considered invalid, and you must report the fuel-specific MER for every hour in which the fuel is combusted, until a successful re-test has been completed. Report “M” for each such hour.

### When to Report “N”

Report “N” if a unit operating parameter is outside of normal limits. For example, report “N” when excess O<sub>2</sub> exceeds by more than 2.0 percent the excess O<sub>2</sub> value recorded at the same operating heat input rate during the last NO<sub>x</sub> emission rate test.

Also, if one or more parameters are outside the normal limits for > 16 consecutive operating hours, a re-test is required within 30 unit operating days or 180 calendar days (whichever occurs first -- see Appendix E, Section 2.3). Beginning with the 17th consecutive “out-of-spec” operating hour and continuing until the re-test is completed, continue to report “N” for each hour of combustion of the fuel(s) that triggered the need for the re-test.

Use missing data procedures from Appendix E for any hour in which “N” is indicated. These procedures require you to substitute the highest tested NO<sub>x</sub> emission rate on the curve for the fuel.

Note: If fuel flow rate and gross calorific value data are missing, use the missing data procedures in Appendix D, not Appendix E.

### When to Report “U”

For units with add-on NO<sub>x</sub> controls only. Report “U” if any parameter used to verify proper operation of the emission controls is outside of normal limits (or the control equipment is not functioning). For these hours, report the fuel-specific NO<sub>x</sub> MER in the Parameter Value for Fuel field.

### When to Report “W”

Report “W” if the hourly heat input rate is higher than the maximum heat input rate correlated on the curve. Use the missing data procedures in section 2.5.2.1 of Appendix E when this occurs. During your next periodic or quality assurance/quality control related testing, test under conditions more representative of your maximum potential heat rate. If possible, use the new maximum heat input rate as the highest heat input point during the next test.

### When to Report “X”

For missing or invalid excess O<sub>2</sub> or other operating parameter data, report “X” and report the highest NO<sub>x</sub> emission rate on the curve for the fuel. This indicates that the hour is not demonstrated to be within the specified limits in Section 2.3 of Appendix E, but it also is not demonstrated to be outside the specified limits. (Note that the use of the “X” value is optional, you may choose instead to treat these hours as out-of-spec.) Hours marked with “N” count towards the 16 consecutive unit operating hours before retesting is required, while hours marked with “X” do not count for this purpose. In either case, the data count against the availability of data where the unit operates within the parameters. If the data availability falls below 90.0 percent, the Agency may require retesting.

**When to Report “Z”**

Report “Z” if the hourly heat input rate is below the lowest heat input rate. In this case it is not necessary to verify that the operational parameters are within any specified limits. Report the same NO<sub>x</sub> emission rate recorded during testing at the lowest heat input rate.

**Segment Number** (*SegmentNumber*)

For an Appendix E NO<sub>x</sub> Emission Rate record (for a unit using one correlation curve for a consistent fuel mixture), report the Segment Number (1 – 4) indicating which portion of the correlation curve was used to determine the value for the hour. For operating condition codes N or X, report the segment number that contains the highest NO<sub>x</sub> emission rate on the curve for the fuel. Leave this field blank if the correlation curve was not used for the hour (i.e., the Operating Condition Code is E, M, U, or W).

**Parameter UOM Code** (*ParameterUOMCode*)

Report the code from Table 41 that identifies the unit of measure in which the Parameter Value for Fuel is reported. Be sure it corresponds properly to the units of measure in which the Hourly Fuel Flow rate was reported.

**Table 41: Units of Measure Codes and Descriptions for Hourly Parameter Fuel Flow**

Parameter	Code	Description
CO2	TNHR	Tons per Hour
DENSOIL	LBBBL	Pounds per Barrel
	LBGAL	Pounds per Gallon
	LBM3	Pounds per Cubic Meter
	LBSCF	Pounds per Standard Cubic Foot
FC	SCFCBTU	CO <sub>2</sub> Standard Cubic Feet/mmBtu
GCV	BTUBBL	BTU per Barrel
	BTUGAL	BTU per Gallon
	BTULB	BTU per Pound
	BTUM3	BTU per Cubic Meter
	BTUSCF	BTU per Standard Cubic Foot
	BTUHSCF	BTU per 100 Standard Cubic Feet
HI	MMBTUHR	Million BTU per Hour
SO2	LBHR	Pounds per Hour
SO2R, NOXR	LBMGBTU	Pounds per Million BTU
SULFUR	PCT	Percent by Weight
	GRHSCF	Grains per 100 Standard Cubic Feet

## 2.5.4 Hourly GFM Data

### Hourly GFM Data Overview

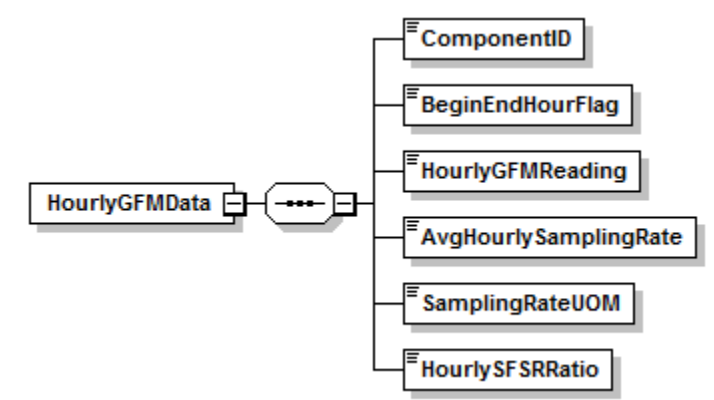
For each hour of a data collection period in which a sorbent trap monitoring system is used, report HOURLY GFM DATA records as follows:

Generally, two HOURLY GFM DATA records will be reported for each hour, i.e., one for each sampling train (“STRAIN”) component of the monitoring system. However, note the following exceptions:

- For hours in which the unit or stack does not operate, do not report any HOURLY GFM DATA records.
- Also, do not report these records for hours outside the current calendar quarter, even though a sample collection period may extend into the next quarter.
- If valid GFM data (sample flow meter volume reading) are not recorded with a particular STRAIN component for the beginning or ending hour of the data collection period, do not report HOURLY GFM DATA records for that component and report a “QA Status Code” of “INC” in the applicable SAMPLING TRAIN DATA record (see section 2.7.1).
- If the trap from one sampling train is accidentally broken, lost, or invalidated, do not report HOURLY GFM DATA records for the STRAIN component associated with that trap, and report a “QA Status Code” of “LOST” in the applicable SAMPLING TRAIN DATA record (see section 2.7.1).
- If the sample gas flow meter was “out-of-control” during the *entire* sample collection period, do not report HOURLY GFM DATA records for the STRAIN component associated with that flow meter, and report a “QA Status Code” of “EXPIRED” in the applicable SAMPLING TRAIN DATA record (see section 2.7.1).
- If the sample gas flow meter was unavailable for *a portion of* the sample collection period, report a code of “N” in the Hourly GFM BeginEndHourFlag for the hours when the sample gas flow meter was unavailable. When “N” is reported for the hour, do not report HourlyGFMReading, AvgHourlySamplingRate, SamplingRateUOM, or HourlySFSRRatio.
- If the trap from one sampling train did not pass the post-monitoring leak check, percent breakthrough, SFSR ratio, or percent spike recovery, do not report HOURLY GFM DATA records for the STRAIN component associated with that trap, and report a “QA Status Code” of “FAILED” in the applicable SAMPLING TRAIN DATA record (see section 2.7.1).

## Hourly GFM Data XML Model

**Figure 17: Hourly GFM Data XML Elements**



### Hourly GFM Data XML Elements

#### **Component ID** (*ComponentID*)

Report the ID number of the STRAIN component used during the hour.

#### **Begin End Hour Flag** (*BeginEndHourFlag*)

Report an “I” flag for the HOURLY GFM DATA record that marks the beginning of the sample collection period. Report an “F” flag to indicate the HOURLY GFM DATA record that marks the end of the sample collection period. Report a “T” flag for a “transition hour,” when one sample collection period ends and another begins in the same hour (pair of sorbent traps is removed from service, and a new pair of traps is placed in service in the same hour). Report an “N” flag for hours when the sample gas flow meter was unavailable during a portion of the sample collection period. When “N” is reported for the hour, do not report HourlyGFMReading, AvgHourlySamplingRate, SamplingRateUOM, or HourlySFSRRatio. For all other hours during a sample collection period, leave this field blank.

#### **Hourly GFM Reading** (*HourlyGFMReading*)

At the beginning and end of the sample collection period, and once in every intermediate hour of the sample collection period, record and report the hourly sample flow meter volume reading, in units of in dry standard cubic meters (dscm). Round off the reading to two decimal places. For instructions on how to report the hourly GFM reading in a “transition hour,” see the “Specific Considerations” section below.

#### **Avg Hourly Sampling Rate** (*AvgHourlySamplingRate*)

Report the average sample flow rate for the hour, rounded to two decimal places. Be sure to express the value in the same units of measure for each hour. For instructions on how to report the sample flow rate in a “transition hour,” see the “Specific Considerations” section below.

#### **Sampling Rate UOM** (*SamplingRateUOM*)

Indicate the units of measure for the Avg Hourly Sampling Rate by reporting the appropriate code from Table 42. For instructions on how to report the sampling rate UOM in a “transition hour,” see the “Specific Considerations” section below.

**Table 42: Sampling Rate Units of Measure Codes and Descriptions**

Code	Description
CCMIN	Cubic Centimeters per Minute
DSCMMIN	Dry Standard Cubic Meters per Minute
LMIN	Liters per Minute
CCHR	Cubic Centimeters per Hour
DSCMHR	Dry Standard Cubic Meters per Hour
LHR	Liters per Hour

**Hourly SFSR Ratio** (*HourlySFSRRatio*)

Report the ratio of the unadjusted hourly average stack gas flow rate to the average hourly sample flow rate, calculated according to Equation 12B-3 of Performance Specification 12B in 40 CFR Part 60, Appendix B. The ratio must be a number between 1 and 100, rounded off to one decimal place.

Use data from the first hour of the sample collection period to calculate the “reference SFSR ratio.” However, if the stack gas flow rate in the first hour of the sample collection period is a substitute data value, defer calculation of the reference ratio until a quality-assured stack gas flow rate is obtained. Also defer calculation of the reference ratio if the first hour of the sample collection period is a “transition hour” (see “Specific Considerations” section below).

For all hours during the sample collection period when valid stack gas flow rate data are available, no more than 5% of the hourly ratios or 5 hourly ratios (whichever is less restrictive) may deviate from the reference ratio by more than  $\pm 25\%$ . Do not calculate the ratio for hours in which the stack gas flow rate is a substitute data value, or if the average sample flow rate is missing or invalid.

**Specific Considerations**

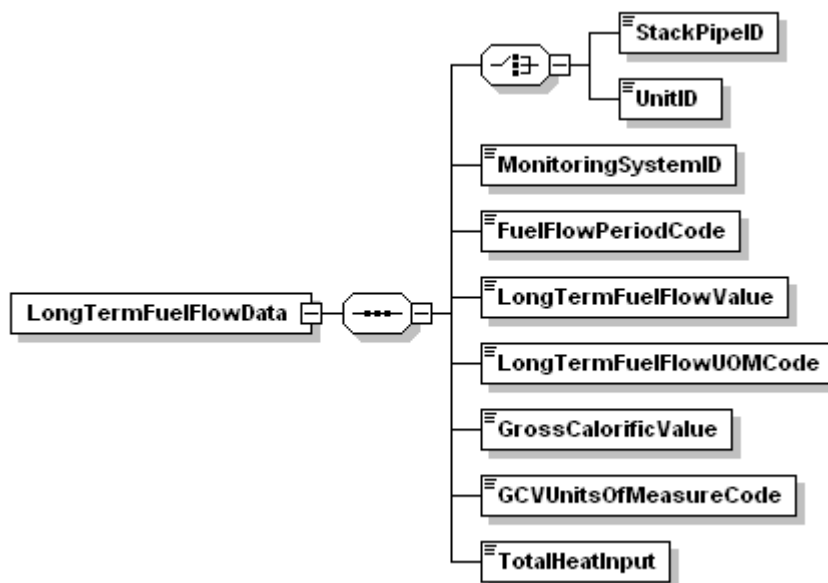
For a “transition hour,” when one pair of sorbent traps is removed from service and a new pair of traps is placed in service, note the following instructions:

- Report the hourly GFM reading, average hourly sampling rate, and sampling rate UOM, for the pair of traps removed from service in the hour.
- Calculate the hourly SFSR ratio for the “old” pair of traps that are removed from service, by taking the ratio of the hourly average stack gas flow rate (even though the pair of traps was used for only part of the hour) to the average sample flow rate for the part of the hour in which the old pair of traps was in operation.
- For the “new” pair of traps that is placed into service, do not use data recorded during the transition hour to calculate the SFSR reference ratio, even though the transition hour is the first hour in the sample collection period. Rather, calculate the SFSR reference ratio for the new pair of traps in the next hour in the sample collection period.

## 2.6 Long Term Fuel Flow Data

### Long Term Fuel Flow Data XML Model

Figure 18: Long Term Fuel Flow Data XML Elements



### Long Term Fuel Flow Data Overview

If you have a qualifying low mass emissions (LME) unit or group of units and use a long term fuel flow system to measure oil or gas to calculate heat input, report a LONG TERM FUEL FLOW DATA record for each long term oil (LTOL) monitoring system and each long term gas (LTGS) monitoring system used during the quarter or reporting period.

For a group of LME units served by a common pipe (or supply tank), you must define a LTOL or LTGS monitoring system in the monitoring plan for the pipe or tank. In both cases (i.e., for common pipe or tank), the pipe or tank ID number must begin with a “CP” prefix (e.g., CP001). If two or more common pipes or tanks of *different* fuel types supply the same group of LME units, you must define a separate LTOL or LTGS system for each pipe or tank. If two or more pipes or tanks supply the same type of fuel to a group of LME units, you may represent it as a single LTOL or LTGS system.

### Long Term Fuel Flow Data XML Elements

#### **Unit ID or Stack Pipe ID** (*UnitID* or *StackPipeID*)

Report either the Unit ID or Stack Pipe ID for the long term fuel flow location. This is the alphanumeric code assigned by a source to identify a unit, stack, or pipe.

#### **Monitoring System ID** (*MonitoringSystemID*)

Report the monitoring system ID, either LTOL or LTGS, for the long term fuel flow (LTFF) system.

**Fuel Flow Period Code** (*FuelFlowPeriodCode*)

If this location is subject to an ozone season program and this is a second quarter emissions file, report either “A” to indicate that this record contains long term fuel flow for the month of April, or “MJ” to indicate that this record contains long term fuel flow for May and June. Otherwise, leave this field blank.

**LTFF Value** (*LongTermFuelFlowValue*)

Report the total fuel flow recorded for the quarter, reporting period, or fuel flow period to zero decimal places. If you measure in units other than gallons, pounds or standard cubic feet, convert the reading to allowable units by using conversion equations.

Instructions for Using Billing Records

- If you have daily billing records, then use the daily fuel usage to apportion the fuel flow on a daily basis to hours within the ozone season or quarter beginning on the first operating day of the ozone season or quarter and ending on the last operating day of the ozone season or quarter.

Example 1. If a billing period starts on June 15 and ends on July 16 and the bill includes daily usage, use the daily quantities to determine which fuel was combusted during June (attributed to the second quarter) and which fuel was combusted during July (attributed to the third quarter).

- If the bill does not specify daily fuel usage, apportion fuel based on unit output, as reported in the OPERATING HOUR DATA record.

Example 2. If the billing period starts on June 15 and ends on July 16, and the bill only has total fuel combusted during the period, apportion the fuel into June and July based on the unit output for the billing period. Thus, if 75 percent of the unit output between June 15 and July 16 occurred during June, then apportion 75 percent of the total fuel into June and 25 percent into July.

- It is the responsibility of the owner/operator to obtain all necessary billing records in time to ensure timely quarterly report submissions.

Instructions for Using Tank Drop Measurements

- For year-round reporting, measure the tank volume (the beginning and ending LTFF measurement) within no more than 48 hours of the beginning or end of a quarter.

Example 3. If you measure the level of oil in a tank on December 30 or 31 or on January 1 or 2, use this measurement (compared to the baseline value at the beginning of the quarter) to calculate the amount of fuel combusted during the quarter (even if the measurement was taken in January). Use this measurement as the baseline for determining the amount of fuel combusted during the next quarter. When apportioning heat input based on unit output only, use output from the beginning and end of the quarter, not the output corresponding to the beginning and end of the actual measurement period.

- Perform as many measurements as necessary to accurately determine fuel usage during the measurement period. The Agency recommends performing measurements before and after fuel is added to a tank unless you know the exact volume of fuel added to the tank.



- If a unit operated for only a very short period or used only a very limited amount of fuel during a quarter or reporting period so that a tank drop measurement will not yield an accurate estimate of the fuel combusted during the quarter, use the unit's maximum rated heat input for each hour of operation during that quarter. Report a method of determination code (MODC) of “45” in the DERIVED HOURLY VALUE DATA (DHV) record for Total Heat Input (HIT) for each hour.

Instructions for Using Certified Fuel Flowmeters

- When a certified Appendix D fuel flowmeter is used for long term fuel flow purposes, you are required to record hourly fuel flow rates. You must also submit MONITORING SYSTEM FUEL FLOW DATA in the monitoring plan and must submit the results of all periodic fuel flowmeter quality assurance tests. However, reporting of hourly fuel flow rate information is not required. Therefore, do not report HOURLY FUEL FLOW DATA (HFF) records for LME units.
- Use the recorded hourly fuel flow rates, fuel usage times (if available), and the density of the fuel (if needed) to determine the total mass or volume (as applicable) of each type of fuel combusted during the reporting period. Then, use Equation LM-2 or LM-3 in §75.19, as appropriate, to calculate the heat input from each type of fuel combusted during the reporting period. Add together all of the reporting period heat input values for all fuels, according to Equation LM-4. Then, apportion the total heat input for the reporting period to each operating hour in the period, using Equations LM-5 through LM-8A (as applicable) replacing the term “quarter” with the term “reporting period.”
- When calculating the total mass or volume of fuel combusted, if hourly fuel usage times are not available, use a value of 1.00 for each operating hour in the reporting period.
- If any fuel flowmeter data are missing for any hour(s) in the reporting period, you must provide substitute data for those hours, using either: (1) the load-based missing data procedures in Appendix D (if these procedures are programmed in the Data Acquisition and Handling System (DAHS)); or (2) the maximum system fuel flow rate in MONITORING SYSTEM FUEL FLOW DATA record).

**Long Term Fuel Flow UOM Code** (*LongTermFuelFlowUOMCode*)

Report the units of measure in which you are reporting fuel flow using one of the following uppercase codes in Table 43.

**Table 43: Long Term Fuel Flow UOM Code**

Code	Description
GAL	Gallons (oil)
LB	Pounds (oil)
SCF	Standard Cubic Feet (gas)

**Gross Calorific Value** (*GrossCalorificValue*)

Report the heat content or gross calorific value (GCV) of the fuel from Table LM-5 of §75.19 or the highest GCV recorded in the previous calendar year from fuel sampling and analysis

according to the procedures of Appendix D to Part 75. If you measure in units other than those listed below, convert to an allowable unit by using appropriate conversion equations. Report the value to one decimal place.

**GCV Units of Measure Code** (*GCVUnitsofMeasureCode*)

Report the units of measure for GCV using one of the uppercase codes in Table 44.

**Table 44: GCV Units of Measure Code**

Code	Description
BTUGAL	Btu per Gallon
BTULB	Btu per Pound
BTUSCF	Btu per Standard Cubic Feet

**Total Heat Input** (*TotalHeatInput*)

Calculate and report the total heat input (mmBtu) measured by the LTFF system for the quarter or reporting period using the appropriate heat input formula from §75.19 (e.g., LM-2, LM-3). Report the value to zero decimal places.

**Specific Considerations**

- If this system is the only LTFF system used for the unit or group of units, apportion this heat input to the unit operating hours in the quarter (or reporting period) using the appropriate equation in §75.19. If two or more LTFF systems are used during the quarter or reporting period, sum the total heat input values from all systems before apportioning heat input to the unit operating hours.
- For a single LME unit which is not part of a group of LME units, the total heat input values for all LTFF systems used during the quarter must equal the quarterly unit heat input value reported in the SUMMARY VALUE DATA record.
- For a group of LME units served by one or more common pipes or tanks, you must report both LTFF and SUMMARY VALUE DATA records under each common pipe (or tank) ID number. For each common pipe or tank ID, the total heat input reported in the LTFF record(s) must equal the quarterly heat input reported in the SUMMARY VALUE DATA record.
- For any hour during which the unit is burning a secondary fuel that is not measured by a long term fuel flow system, you must calculate the total heat input for the hour using the maximum rated hourly heat input rate for the unit. Report an MODC of “45” in the DHV record for (HIT) for the hour.
- If a unit (or group of units linked to a common pipe) using LTFF to determine heat input burns fuel, but does not generate any load during the reporting period, apportion the total heat input based on operating time instead of load using the appropriate equation in §75.19.

## 2.7 Sorbent Trap Data

### Sorbent Trap Data Overview

Report a SORBENT TRAP DATA record for each sorbent trap sampling period that begins inside the current calendar quarter.

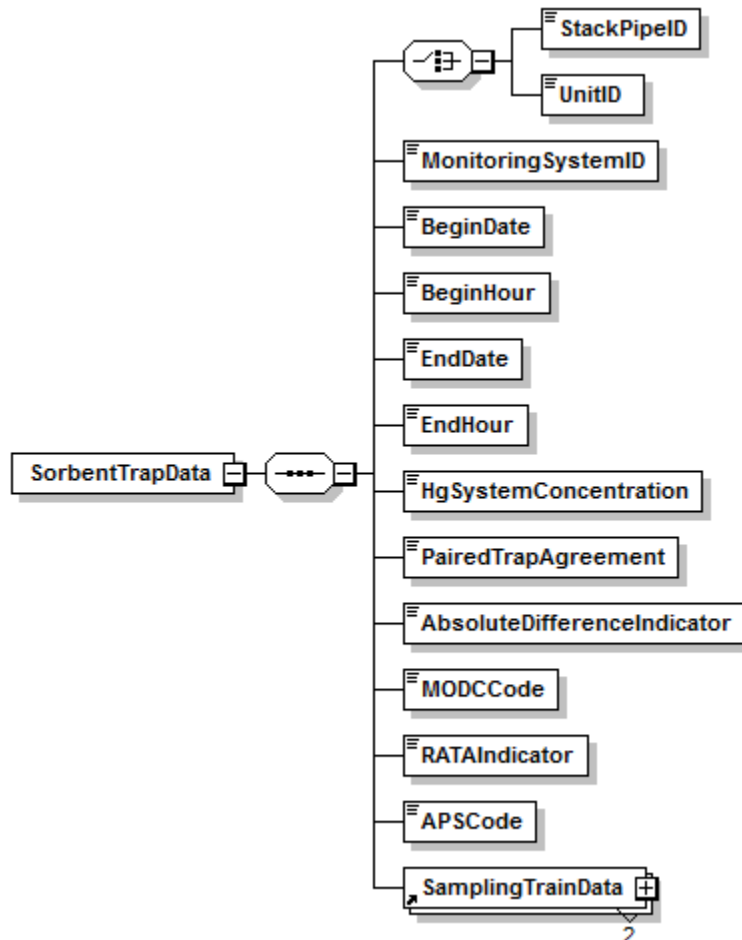
To the extent practicable, time the sample collection periods so that they do not cross quarter boundaries. However, if a sample collection period does extend into the next quarter:

- Be sure to end it early enough to obtain and process the results before the deadline for submitting the emissions report for the current quarter; and
- Include it in the emissions report for the current quarter, even though its end date is in the next quarter.

Report all relevant hourly MHV and MMHV records for each sample collection period (i.e., records of Hg concentration and all auxiliary parameters needed to convert Hg concentration to the units of the applicable emission standard).

### Sorbent Trap Data XML Model

Figure 19: Sorbent Trap Data XML Elements



### Sorbent Trap Data XML Elements

**Unit ID or Stack Pipe ID** (*UnitID* or *StackPipeID*)

Report either the Unit ID or Stack Pipe ID (i.e., the monitoring location). This is the alphanumeric code assigned by a source to identify a unit, stack, or pipe.

**Monitoring System ID** (*MonitoringSystemID*)

Report the monitoring system ID for the sorbent trap monitoring system represented by this record.

**Begin Date** (*BeginDate*)

Report the date that the sample collection period began.

**Begin Hour** (*BeginHour*)

Report the hour that the sample collection period began.

**End Date** (*EndDate*)

Report the date that the sample collection period ended. This date could be in the next calendar quarter.

**End Hour** (*EndHour*)

Report the last hour of the sample collection period.

**HgSystemConcentration** (*HgSystemConcentration*)

Determine the quality-assured, unadjusted Hg concentration for the monitoring system ( $\mu\text{g}/\text{scm}$ ), as follows:

If the QA Status Code (from section 2.7.1) is “PASSED” for both sampling train (“STRAIN”) components of the system and the relative deviation (RD) criterion is also met, then average the measured Hg concentrations from the two components arithmetically and report the result using one leading non-zero digit and one decimal place, expressed in scientific notation.; For data prior to September 9, 2020, report the result rounded to three significant figures.

If the QA Status Code is “PASSED” for one of the STRAIN components and “FAILED” or “LOST” for the other, multiply the Hg concentration obtained with the passing component by 1.111 and report the result using one leading non-zero digit and one decimal place, expressed in scientific notation. For data prior to September 9, 2020, report the result rounded to three significant figures.

If the QA Status Code for both trains is “UNCERTAIN” (indicating that all QA/QC criteria were met for both STRAIN components, but the relative deviation (RD) criterion was not met), you may either invalidate the data or report the higher of the two measured Hg concentrations using one leading non-zero digit and one decimal place, expressed in scientific notation. For data prior to September 9, 2020, report the result rounded to three significant figures.

Report the Hg System Concentration in a MMHV record, for each hour of the sample collection period (see “Specific Considerations” in section 2.5.1.1). Report each concentration value to three significant figures, using scientific notation, keeping only one leading non-zero digit to the left of the decimal point and one decimal place, with the “E” capitalized and no spaces in

between the characters. For example, if the Hg concentration is 0.159 µg/scm, report 1.~~659~~E-1. Do not use “plus” characters after the “E” when reporting concentrations greater than or equal to one. For example, if the Hg concentration is 1.59 µg/scm, report 1.~~659~~E0. For data prior to September 9, 2020, report the Hg concentration value to three significant figures, using scientific notation. For example, if the Hg concentration is 0.159 µg/scm, report 1.59E-1.

Leave this field blank if a quality-assured Hg concentration for the sample collection period is not available. The Hg concentration is considered to be unavailable if:

- The QA Status Code is “EXPIRED” or “INC” for either or both STRAIN components;
- The QA Status Code is “FAILED” or “LOST” for both STRAIN components;
- The QA Status Code for both STRAIN components is “UNCERTAIN” and you elect to invalidate the data; or
- If the flue gases are routed through an unmonitored bypass stack and the Hg concentration is not measured.

#### **Paired Trap Agreement** (*PairedTrapAgreement*)

Report either the relative deviation (RD) or absolute difference between Traps “a” and “b,” rounded to two decimal places. Calculate the RD using Equation 12B-7 in Performance Specification 12B.

Leave this field blank if:

- The QA Status Code is “EXPIRED,” “FAILED,” or “INC” for either or both STRAIN components;
- The QA Status Code is “LOST” for both trains; or
- If the flue gases are routed through an unmonitored bypass stack and the Hg concentration is not measured.

#### **Absolute Difference Indicator** (*AbsoluteDifferenceIndicator*)

If the paired trap difference is determined based on the relative deviation, report “0.” If the absolute difference is used, report “1.”

Leave this field blank if PairedTrapAgreement is also left blank for any of the reasons detailed above.

#### **MODC Code** (*MODCCode*)

Report the method of determination code (MODC) from Table 45 for the hourly Hg concentration.

The QA Status Codes from section 2.7.1 are used to determine the appropriate MODC, as follows:

Report a MODC of “01” (or “02” for a backup monitoring system) if the QA Status Code for both STRAIN components is “PASSED.” Report this same MODC in a MMHV record for each hour of the sample collection period (see section 2.5.1.1).

Report a MODC of “32” if the QA Status Code is “PASSED” for one of the STRAIN components and “FAILED” or “LOST” for the other. Report this same MODC in a MMHV record for each hour of the sample collection period.

Report a MODC of “33” if the QA Status Code for both STRAIN components is “UNCERTAIN” and you elect to report the higher of the two Hg concentrations. Report this same MODC in a MMHV record for each hour of the sample collection period.

Report a MODC of “34” if:

- The QA Status Code is “EXPIRED” or “INC” for either or both STRAIN components;
- The QA Status Code is “FAILED” or “LOST” for both STRAIN components; or
- The QA Status code for both STRAIN components is “UNCERTAIN” and you elect to invalidate the data.

When MODC “34” is reported in this field, also report MODC “34” in a MMHV record for each hour of the sample collection period and report MODC “38” in a MDHV record for each hour of the sample collection period (see section 2.5.2.1).

Report MODC “35” in this field if the flue gases are routed through an unmonitored bypass stack and the Hg concentration is not measured. Report this same MODC in a MMHV record and report MODC “38” in a MDHV record, for each hour of the sample collection period (see section 2.5.2.1).

Report a MODC of “43” if the QA Status Code for both STRAIN components is “PASSED” and the method detection level is reported as the measured emissions level for the sorbent trap (see 63.10007(e)(1)). Report this same MODC in a MMHV record, and report MODC “36” in a MDHV record, for each hour of the sample collection period (see section 2.5.1.1).

Report a MODC of “44” in this field if one trap in a paired train meets the criteria to report the method detection level and the QA Status Code is “FAILED” or “LOST” for the other STRAIN component. (see 63.10007(e)(1)). Report this same MODC in a MMHV record for each hour of the sample collection period, and report MODC “36” in a MDHV record for each hour of the sample collection period (see section 2.5.2.1).

**Table 45: MODC Codes for Sorbent Trap Data**

<b>Code</b>	<b>Description</b>
01	Primary Monitoring System (and Primary Bypass (PB))
02	Redundant Backup or Regular Non-Redundant Backup Monitoring System
32	Hourly Hg concentration determined from analysis of a single sorbent trap multiplied by a factor of 1.111
33	Hourly Hg concentration determined from the sorbent trap with the higher Hg concentration (relative deviation criterion for the paired traps is not met)
34	Hourly Hg concentration is missing or invalid
35	Hourly Hg concentration not monitored (flue gases routed through an unmonitored bypass stack)
43	Hourly Hg concentration reported as method detection level when the sorbent trap concentration reading is below the method defined analytical detection level (see 63.10007(e)(1))
44	Hourly Hg concentration determined from analysis of a single sorbent trap which reports the method detection level, multiplied by a factor of 1.111 in cases where the other trap was accidentally lost, damaged, or broken and could not be analyzed

**RATAIndicator** (*RATAIndicator*)

If the pair of traps were used as part of a set of RATA runs which were not long enough to collect a Reference SFSR Ratio, report the code "1." For all other traps leave this field blank.

**APSCode** (*APSCode*)

If the pair of traps were used as part of a RATA run and meet the alternative performance specifications of PS12B, report the code "RATA." For all other traps leave this field blank.

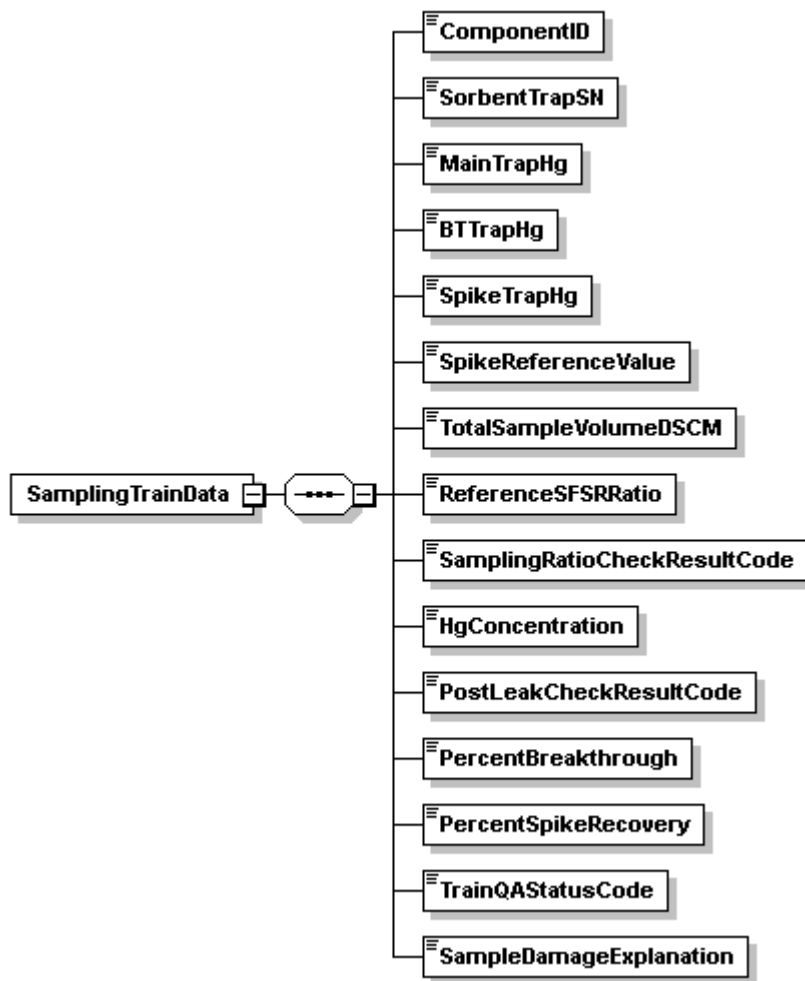
## 2.7.1 Sampling Train Data

### Sampling Train Data Overview

For each SORBENT TRAP DATA record, submit two SAMPLING TRAIN DATA records, i.e., one for each sampling train (“STRAIN”) component of the sorbent trap monitoring system.

### Sampling Train Data XML Model

Figure 20: Sampling Train Data XML Elements



### Sampling Train Data XML Elements

**Component ID** (*ComponentID*)

Report the STRAIN component ID.

**Sorbent Trap SN** (*SorbentTrapSN*)

Report the serial (ID) number of sorbent trap associated with the STRAIN component.



**Main Trap Hg** (*MainTrapHg*)

Report the mass of Hg recovered from the main collection section (Section 1) of the sorbent trap, in micrograms ( $\mu\text{g}$ ) ~~rounded to three significant figures~~ using scientific notation. For example, “0.0144  $\mu\text{g}$ ” should be reported as “1.44E-2.” The “E” must be capitalized, and the field must not contain spaces in between the characters. Do not use “plus” characters after the “E” when reporting concentrations greater than or equal to one. For example, “1.44  $\mu\text{g}$ ” should be reported as “1.44E0.” Report only one ~~figure-leading non-zero digit~~ to the left of the decimal point, and one digit after the decimal point. For data prior to September 9, 2020, report the mass in scientific notation rounded to three significant figures. For example, if the mass of Hg is 0.159  $\mu\text{g}/\text{scm}$ , report 1.59E-1.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**BT Trap Hg** (*BTTrapHg*)

Report the mass of Hg recovered from the breakthrough section (Section 2) of the sorbent trap, in micrograms ( $\mu\text{g}$ ) ~~rounded to three significant figures~~ using scientific notation. For example, “0.0144  $\mu\text{g}$ ” should be reported as “1.44E-2.” The “E” must be capitalized, and the field must not contain spaces in between the characters. Do not use “plus” characters after the “E” when reporting concentrations greater than or equal to one. For example, “1.44  $\mu\text{g}$ ” should be reported as “1.44E0.” Report only one ~~figure-leading non-zero digit~~ to the left of the decimal point, and one digit after the decimal point. For data prior to September 9, 2020, report the mass in scientific notation rounded to three significant figures. For example, if the mass of Hg is 0.159  $\mu\text{g}/\text{scm}$ , report 1.59E-1.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Spike Trap Hg** (*SpikeTrapHg*)

Report the mass of Hg recovered from the spiked section (Section 3) of the sorbent trap, in micrograms ( $\mu\text{g}$ ) ~~rounded to three significant figures~~ using scientific notation. For example, “0.0144  $\mu\text{g}$ ” should be reported as “1.44E-2.” The “E” must be capitalized and the field must not contain spaces in between the characters. Do not use “plus” characters after the “E” when reporting concentrations greater than or equal to one. For example, “1.44  $\mu\text{g}$ ” should be reported as “1.44E0.” Report only one ~~figure-leading non-zero digit~~ to the left of the decimal point, and one digit after the decimal point. For data prior to September 9, 2020, report the mass in scientific notation rounded to three significant figures. For example, if the mass of Hg is 0.159  $\mu\text{g}/\text{scm}$ , report 1.59E-1.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Spike Reference Value** (*SpikeReferenceValue*)

Report the mass of the pre-sampling Hg spike in micrograms ( $\mu\text{g}$ ), calculated according to Equation 12B-1 in Performance Specification 12B ~~rounded to three significant figures~~ using scientific notation. For example, “0.0144  $\mu\text{g}$ ” should be reported as “1.44E-2.” The “E” must be capitalized, and the field must not contain spaces in between the characters. Do not use “plus” characters after the “E” when reporting concentrations greater than or equal to one. For example, “1.44  $\mu\text{g}$ ” should be reported as “1.44E0.” Report only one ~~figure-leading non-zero digit~~ to the left of the decimal point, and one digit after the decimal point. For data prior to September 9, 2020, report the mass in scientific notation rounded to three significant figures. For example, if the mass of Hg is 0.159  $\mu\text{g}/\text{scm}$ , report 1.59E-1.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Total Sample Volume DSCM** (*TotalSampleVolumeDSCM*)

Report the total volume of dry gas metered, in dry standard cubic meters (dscm), rounded to two to four decimal places.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Reference SFSR Ratio** (*ReferenceSFSRRatio*)

From the data recorded in the first hour of the sample collection period, determine the reference ratio of the unadjusted hourly stack gas volumetric flow rate to the average sample flow rate (i.e., the “SFSR” Ratio), according to Equation 12B-2 in Performance Specification 12B. Report the Reference SFSR Ratio as a number between 1 and 100 rounded to one decimal place.

If the stack gas flow rate in the first hour of the sample collection period is a substitute data value, defer calculation of the reference ratio until a quality-assured hourly stack gas flow rate is obtained. Also, if the first hour of the sample collection period is a “transition hour” (i.e., an operating hour in which one pair of sorbent traps is removed from service and a second pair of traps is placed in service), defer calculation of the reference SFSR ratio for the “new” pair of traps until the next hour of the sample collection period.

Maintain the SFSR ratio within  $\pm 25\%$  of the reference ratio for each subsequent hour of the sample collection period (see Table 12B-1 of Performance Specification 12B). However, do not calculate the ratio for hours in which the stack gas flow rate is a substitute data value or if the average sample flow rate is missing or invalid. For a discussion of how to report the hourly SFSR ratio during transition hours, see the “Specific Considerations” in section 2.5.4.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Sampling Ratio Check Result Code** (*SamplingRatioCheckResultCode*)

Based on the criterion in Table 12B-1 of Performance Specification 12B, report the appropriate code from Table 46 to indicate whether the ratio of the stack gas flow rate to the sampling rate was maintained within the required percentage, as follows:

**Table 46: Sampling Ratio Check Result Codes and Descriptions**

Code	Description
PASSED	Test was passed. The hourly ratio was maintained within 25% of the reference ratio throughout the sample collection period.
FAILED	Test was failed. The hourly ratio was not maintained within 25% of the reference ratio throughout the sample collection period.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Hg Concentration** (*HgConcentration*)

Report the Hg concentration determined from the total Hg catch (sum of the mass collected in sections 1 and 2 of the sorbent trap) and the total volume of dry gas metered. Use Equation 12B-6 in Performance Specification 12B to calculate the Hg concentration in  $\mu\text{g}/\text{scm}$  rounded to three significant figures using scientific notation. For example, if the Hg concentration is 0.0245  $\mu\text{g}/\text{scm}$ , report 2.45E-2. The “E” must be capitalized and the field must not contain spaces in between the characters. Do not use “plus” characters after the “E” when reporting concentrations greater than or equal to one. For example, if the Hg concentration is 2.45  $\mu\text{g}/\text{scm}$ , report 2.45E0. Report only one figure-leading non-zero digit to the left of the decimal point, and one digit after the decimal point. For data prior to September 9, 2020, report the mass in scientific notation rounded to three significant figures. For example, if the Hg concentration is 0.159  $\mu\text{g}/\text{scm}$ , report 1.59E-1.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Post Leak Check Result Code** (*PostLeakCheckResultCode*)

Report the results of the post-test leak check conducted at the end of the sample collection period. If the post-test leak check is passed, report “PASSED,” if the leak check is failed, report “FAILED.”

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Percent Breakthrough** (*PercentBreakthrough*)

Report the percent breakthrough, calculated according to Equation 12B-5 in Performance Specification 12B.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” if the measured Hg concentration is not less than 10% of the Hg limit equivalent concentration, or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Percent Spike Recovery** (*PercentSpikeRecovery*)

Report the percent spike recovery, calculated according to Equation 12B-4 in Performance Specification 12B, rounded to one decimal place.

Leave this field blank if the sample was accidentally lost, damaged, or broken and could not be analyzed, if the sample gas flow meter was “out-of-control,” or if the sample gas volume reading for the initial or final hour of the sample collection period was missing or invalid.

**Train QA Status Code** (*TrainQAStatusCode*)

Report the appropriate code from Table 47 below to indicate the QA status of this sampling train.

**Table 47: Train QA Status Codes and Descriptions**

Code	Description
PASSED	The post-monitoring leak check, % breakthrough, stack flow-to-sample flow ratio, and % spike recovery criteria in PS 12B were all met, and the QA status of the sample flow meter was “in control.”
FAILED	The QA status of the sample flow meter was “in control,” but at least one of the following four QA/QC criteria in PS 12B was <u>not</u> met: the post-monitoring leak check; % breakthrough; stack flow-to-sample flow ratio; or % spike recovery.
INC	Gas Flow Meter data are incomplete (missing or invalid for the beginning or ending hour of the sample collection period)
EXPIRED	Required QA (calibration) was not performed on the sample flow meter component. The QA status of the flow meter is “out-of-control.”
LOST	Trap was accidentally lost, damaged, or broken and could not be analyzed
UNCERTAIN	The post-monitoring leak check, % breakthrough, stack flow-to-sample flow ratio, and % spike recovery criteria in PS 12B were all met, and the QA status of the sample flow meter was “in control.” However, the relative deviation (RD) criterion for the paired traps was not met

**Sample Damage Explanation** (*SampleDamageExplanation*)

Whenever the sample is accidentally lost, damaged, or broken and cannot be analyzed (i.e., the Train QA Status Code is “LOST”), provide a brief explanation of the reason why the sample could not be analyzed.

## 2.8 NSPS Subpart TTTT Compliance Reports

### NSPS Subpart TTTT Compliance Reports Overview

If your EGU is subject to the NSPS Greenhouse Gas Rule (40 CFR 60 Subpart TTTT), you must begin submitting quarterly compliance reports after you have accumulated 12 operating months of CO<sub>2</sub> emissions data. The initial quarterly report must include the twelfth operating month in the first 12-operating month compliance period.

Each quarterly compliance report must include the applicable information in this section, 2.8. Note that the annual potential and actual energy output and electrical output values are reported only in the report for the fourth calendar quarter.

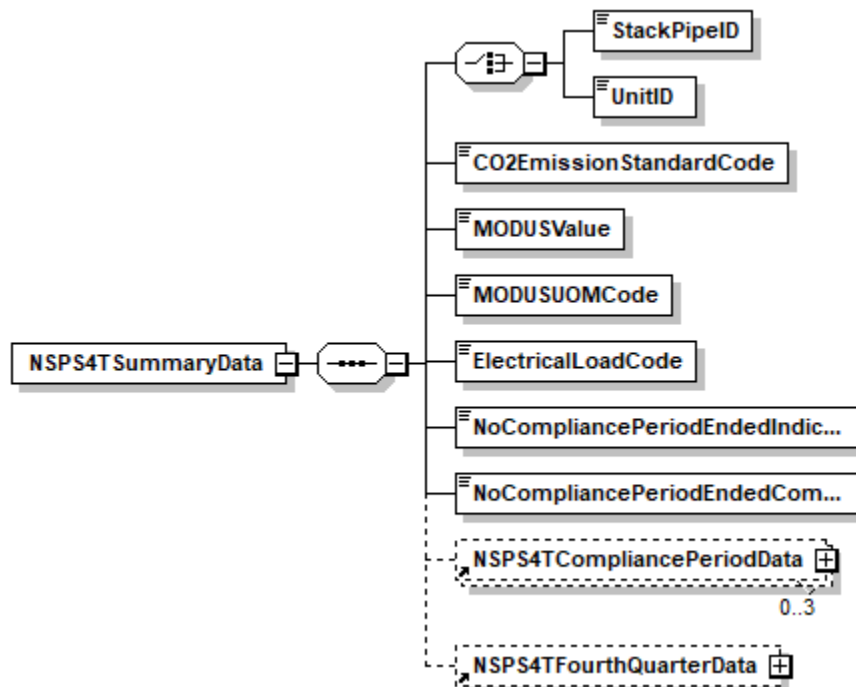
If any month in the calendar quarter is the twelfth operating month in a compliance period, you must also report the applicable information in section 2.8.1 of these instructions for that compliance period.

In the fourth calendar quarter of each year in which you submit quarterly compliance reports, you must also report the applicable information in section 2.8.2 of these instructions.

If your EGU is not subject to the NSPS Greenhouse Gas Rule, do not report any of the data elements in sections 2.8, 2.8.1, or 2.8.2 in your quarterly emissions file.

### NSPS Summary Data XML Model

**Figure 21: NSPS4T Summary Data XML Elements**



NSPS4T Summary Data XML Elements**CO2 Emissions Standard Code (CO2StandardCode)**

Report the code from Table 48, below, which corresponds with the emissions standard from Table 1 or Table 2 of subpart TTTT with which the EGU must comply.

**Table 48: CO2 Emissions Standard Codes**

<b>Code</b>	<b>Description</b>
NEW640	Newly constructed steam generating unit or integrated gasification combined cycle (IGCC) following the standard in Table 1 of Subpart TTTT: <b>640 kg CO<sub>2</sub>/MWh of gross energy output</b>
RCON910	Reconstructed steam generating unit or IGCC that has base load rating of 2,000 MMBtu/h or less following the standard in Table 1 of Subpart TTTT: <b>910 kg of CO<sub>2</sub> per MWh of gross energy output</b>
RCON820	Reconstructed steam generating unit or IGCC that has a base load rating greater than 2,000 MMBtu/h following the standard in Table 1 of Subpart TTTT: <b>820 kg of CO<sub>2</sub> per MWh of gross energy output</b>
MODUS	A modified steam generating unit or IGCC using a unit-specific standard that must be: <b>≥ 820 kg of CO<sub>2</sub> /MWh gross, for units with a base load &gt; 2,000 mmBtu/hr</b> or <b>≥ 910 kg of CO<sub>2</sub> / MWh gross, for units with a base load ≤ 2,000 mmBtu/hr</b>
CTOUT	Newly constructed or reconstructed stationary combustion turbine that supplies more than its design efficiency or 50 percent, whichever is less, times its potential electric output as net-electric sales on both a 12-operating month and a 3-year rolling average basis, and combusts more than 90% natural gas on a heat input basis on a 12-operating-month rolling average basis following the standard in Table 2 of Subpart TTTT: <b>450 kg (<del>4,000 lb</del>) of CO<sub>2</sub> per MWh of gross energy output</b>
<u>CTOLB</u>	<u>Newly constructed or reconstructed stationary combustion turbine that supplies more than its design efficiency or 50 percent, whichever is less, times its potential electric output as net-electric sales on both a 12-operating month and a 3-year rolling average basis, and combusts more than 90% natural gas on a heat input basis on a 12-operating-month rolling average basis following the standard in Table 2 of Subpart TTTT:</u> <b><u>1,000 lb of CO<sub>2</sub> per MWh of gross energy output</u></b>
CTOUTNT	Newly constructed or reconstructed stationary combustion turbine that supplies more than its design efficiency or 50 percent, whichever is less, times its potential electric output as net-electric sales on both a 12-operating month and a 3-year rolling average basis, and combusts more than 90% natural gas on a heat input basis on a 12-operating-month rolling average basis following the standard in Table 2 of Subpart TTTT: <b>470 kg (<del>1,030 lb</del>) of CO<sub>2</sub> per MWh of net energy output</b>
<u>CTOLBNT</u>	<u>Newly constructed or reconstructed stationary combustion turbine that supplies more than its design efficiency or 50 percent, whichever is less, times its potential electric output as net-electric sales on both a 12-operating month and a 3-year rolling average basis, and combusts more than 90% natural gas on a heat input basis on a 12-operating-month rolling average basis following the standard in Table 2 of Subpart TTTT:</u> <b><u>1,030 lb of CO<sub>2</sub> per MWh of net energy output</u></b>

CTHING	<p>Newly constructed or reconstructed stationary combustion turbine that supplies its design efficiency or 50 percent, whichever is less, times its potential electric output or less as net-electric sales on either a 12-operating month or a 3-year rolling average basis, and combusts more than 90% natural gas on a heat input basis on a 12-operating-month rolling average basis following the standard in Table 2 of Subpart TTTT:</p> <p style="text-align: center;"><b>120 lb CO<sub>2</sub> /mmBtu</b></p>
CTHIMF	<p>Newly constructed and reconstructed stationary combustion turbine that combusts 90% or less natural gas on a heat input basis on a 12-operating-month rolling average basis, as determined by the procedures in §60.5525 following the standard in Table 2 of Subpart TTTT:</p> <p style="text-align: center;"><b>120 lb CO<sub>2</sub>/MMBtu) to 160 lb CO<sub>2</sub>/MMBtu</b></p>

**MODUS Value** (*MODUSValue*)

If the EGU is complying with a unit-specific CO<sub>2</sub> emission standard, report the numeric value of the standard. For all other CO<sub>2</sub> emission standards, leave this field blank.

**MODUS Units of Measure Code** (*MODUSUOMCode*)

Report the units of measure from Table 49, below, which correspond to the unit-specific CO<sub>2</sub> emission standard.

**Table 49: CO<sub>2</sub>M Emission Rate Units of Measure Code**

Code	Description
KGMWH	kg/MWh
LBMMBTU	lb/MMBTU
LBMWH	lb/MWh

**Electrical Load Code** (*ElectricalLoadCode*)

Report a code of either “GROSS” or “NET” to indicate if the energy output values used in compliance determination are based solely upon gross or net electrical load.

**No Compliance Period Ended Indicator** (*NoCompliancePeriodEndedIndicator*)

Indicate if a compliance period ended in the quarter for which the report is being prepared. Use a “1” for yes and “0” for no.

**No Compliance Period Ended Comment** (*NoCompliancePeriodEndedComment*)

If there are no compliance periods that end in the quarter for which the report is prepared, include a statement to that effect.

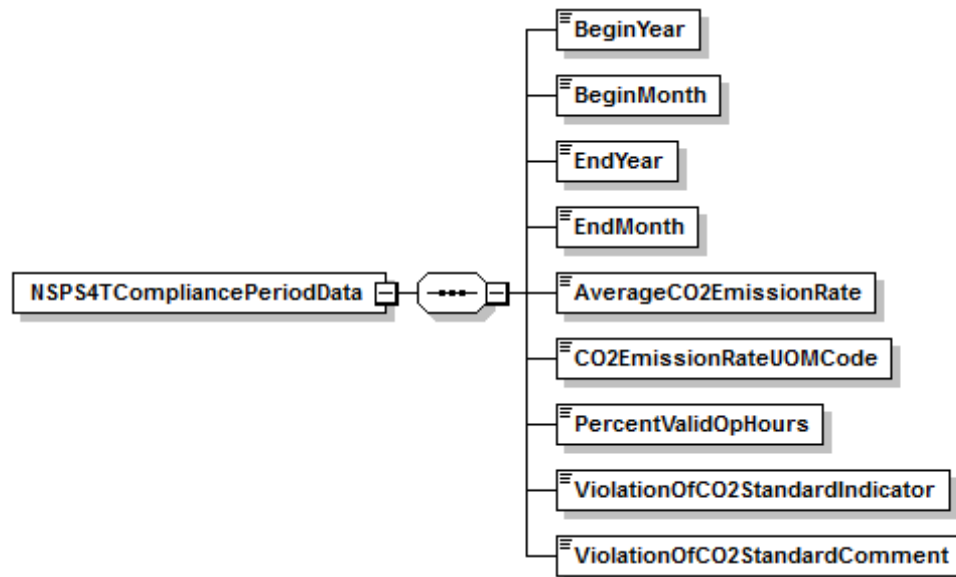
## 2.8.1 NSPS4T Compliance Period Data

### NSPS4T Compliance Period Data Overview

You must report data in the “Compliance Period End” field in each quarterly report. Then, if any month in the calendar quarter is the twelfth operating month in a 12- operating month compliance period, you must report the applicable data elements in this section, 2.8.1, for that compliance period. Do not report these elements if your EGU is not subject to this subpart.

### NSPS4T Compliance Period Data XML Model

Figure 22: NSPS4T Compliance Period Data XML Elements



### NSPS4T Compliance Period Data XML Elements

#### **Begin Year** (*BeginYear*)

Report the year (20xx) in which the first operating month in the compliance period occurred.

#### **Begin Month** (*BeginMonth*)

Report the first operating month in the compliance period for which you performed a CO<sub>2</sub> mass emissions rate calculation as a numerical value 10-12.

#### **End Year** (*EndYear*)

Report the year (20xx) in which the twelfth operating month in the compliance period occurred.

#### **End Month** (*EndMonth*)

Report the twelfth operating month in the compliance period for which a CO<sub>2</sub> mass emission rate was calculated as a numerical value 01-12.

#### **Average CO<sub>2</sub> Emission Rate** (*AverageCO2EmissionRate*)

Report the average CO<sub>2</sub> mass emissions rate for the compliance period.



**CO<sub>2</sub> Emission Rate Units of Measure Code** (*CO2EmissionRateUOMCode*)

Indicate the units of measure of the average CO<sub>2</sub> emission rate using the appropriate code from Table 49. ~~either kg/MWh or lb/mmBtu.~~

**Percent Valid Operating Hours** (*PercentValidOpHours*)

Report the percentage of valid operating hours in each 12-month compliance period. If more than one compliance period ends in the quarter, report one PercentValidOpHours for each compliance period.

**Violation of CO<sub>2</sub> Standard** (*ViolationofCO2StandardIndicator*)

Indicate whether or not the EGU violated the applicable CO<sub>2</sub> emission standard in the compliance period. Report “1” if a violation did occur and “0” if no violation of the standard occurred.

**Violation of CO<sub>2</sub> Standard Comment** (*ViolationofCO2StandardComment*)

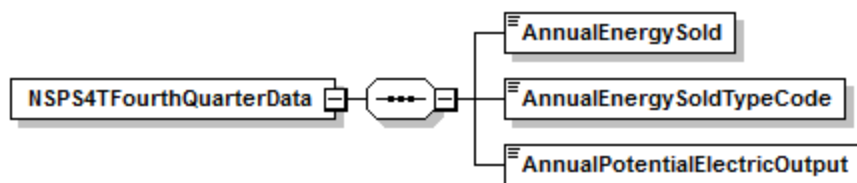
If one or more compliance periods ends in the quarter and there are no violations of the CO<sub>2</sub> emissions standard that occurred for the affected EGU, include a statement indicating this.

## 2.8.2 NSPS4T Fourth Quarter Data

In the report for the fourth calendar quarter of the year, you must include certain data elements not required in other calendar quarters. Do not report these elements if your EGU is not subject to this subpart.

### NSPS4T Fourth Quarter Data XML Model

Figure 23: NSPS4T Fourth Quarter Data XML Elements



### NSPS4T Fourth Quarter Data XML Elements

#### **Annual Energy Sold** (*AnnualEnergySold*)

In the report for the fourth quarter, report the amount of output sold over the four quarters of the calendar year. Leave this field blank if the report is for any other quarter.

#### **Annual Energy Sold Type Code** (*AnnualEnergySoldTypeCode*)

Report a code of either “GROSS” or “NET” to indicate if the annual energy sold to the grid was in terms of gross or net energy for the unit. Leave this field blank if the report is for any other quarter.

#### **Annual Potential Electric Output** (*AnnualPotentialElectricOutput*)

In the report for the fourth calendar quarter of each year, report the potential annual electric output of the EGU in the report, in units of megawatt hours (MWh). Leave this field blank for all other quarterly reports.