

The Emissions Collection and Monitoring Plan Project

Monitoring Plan XML Schema Version 1.2

Submitted to:

ECMPS Stakeholders

Submitted by:

United States Environmental Protection Agency
Office of Air and Radiation
Clean Air Markets Division
1201 Constitution Ave, NW
Washington, DC 20004

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Monitoring Plan XML Schema Version 1.2

1.0 Introduction

This document is the second in a series that outlines the Extensible Mark-up Language (XML) schema and how data files must be formatted for the Emissions Collection and Monitoring Plan System (ECMPS). A schema has been developed for each data type, i.e., monitoring plan, quality assurance and certification test data, emissions data. The schema will be used for all monitoring plan data that are imported into the ECMPS Client Tool and exported from the Client Tool. The move to XML will allow users to submit only the necessary data for a given submission of data. It will also allow for more robust data validation through the XML schema.

The schema is included in a separate file. The schema may be viewed in any application that is able to display text files or an application specifically designed for viewing XML schema.

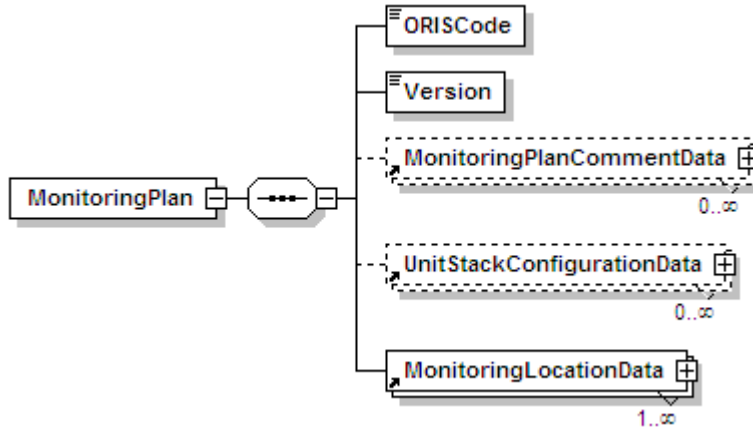
2.0 Monitoring Plan XML Schema Tables

The following tables provide information about the data elements of the Monitoring Plan XML schema. The information includes a description of the data element and the type of the element.

Figures 1 and 2 provide information on the root element of the Monitoring Plan XML schema. Figure 3 lists all of the complex data elements and information that indicates the parent-child relationship between the major data elements. Figures 4 through 53 include information on the complex data elements in the XML schema.

Detailed information about the data types is included in Figure 54. The term "optional" is often used in the names of the various data types. The term "optional" in the name of these data validation data types only refers to the fact that the schema validation will accept a data element tag that does not include a value (an empty tag). Depending on the data being reported, these data elements might require data to be reported.

**Figure 1
MonitoringPlan**



**Figure 2
MonitoringPlan XML Elements**

XML Tag	Type	Definition
ORISCode	ORISCodeType	EIA--assigned identifier or Facility identifier assigned by CAMD (if EIA number is not applicable).
Version	VersionType	Identifies the XML schema version.

**Figure 3
Complex Elements of the MonitoringPlan Root**

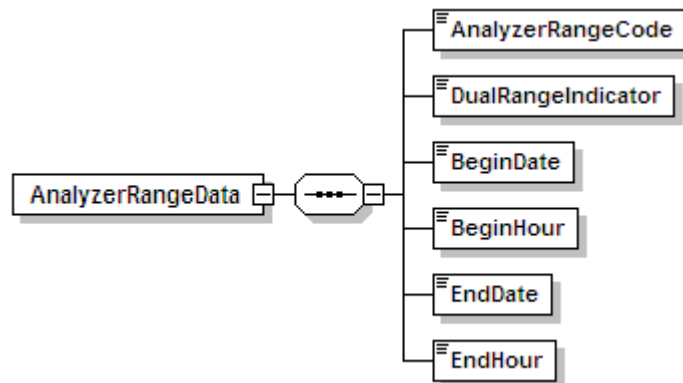
Complex Element	Parent Element	Minimum Occurrences	Maximum Occurrences
AnalyzerRangeData	ComponentData	0	unbounded
ComponentData	StackPipeData or UnitData	0	unbounded
MonitoringDefaultData	StackPipeData or UnitData	0	unbounded
MonitoringFormulaData	StackPipeData or UnitData	0	unbounded
MonitoringLoadData	StackPipeData or UnitData	0	unbounded
MonitoringLocationAttribData	StackPipeData or UnitData	0	unbounded
MonitoringLocationData	MonitoringPlan	1	unbounded
MonitoringMethodData	StackPipeData or UnitData	0	unbounded
MonitoringPlan		1	1

(cont.)

**Figure 3
Complex Elements of the MonitoringPlan Root (cont.)**

Complex Element	Parent Element	Minimum Occurrences	Maximum Occurrences
MonitoringPlanCommentData	MonitoringPlan	0	unbounded
MonitoringQualificationData	StackPipeData or UnitData	0	unbounded
MonitoringQualLEEData	MonitoringQualificationData	0	unbounded
MonitoringQualLMEData	MonitoringQualificationData	0	unbounded
MonitoringQualPercentData	MonitoringQualificationData	0	unbounded
MonitoringSpanData	StackPipeData or UnitData	0	unbounded
MonitoringSystemComponentData	MonitoringSystemData	0	unbounded
MonitoringSystemData	StackPipeData or UnitData	0	unbounded
MonitoringSystemFuelFlowData	MonitoringSystemData	0	unbounded
RectangularDuctWAFData	StackPipeData or UnitData	0	unbounded
StackPipeData	MonitoringLocationData	0	unbounded
SupplementalMATSMonitoringMethodData	StackPipeData or UnitData	0	unbounded
UnitCapacityData	UnitData	0	unbounded
UnitControlData	UnitData	0	unbounded
UnitData	MonitoringLocationData	0	unbounded
UnitFuelData	UnitData	0	unbounded
UnitStackConfigurationData	MonitoringPlan	0	unbounded

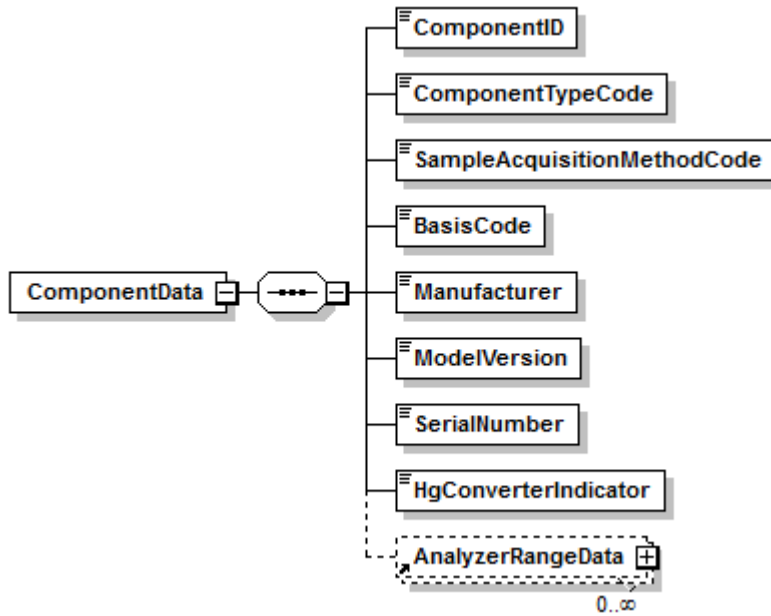
**Figure 4
AnalyzerRangeData**



**Figure 5
AnalyzerRangeData XML Elements**

XML Tag	Type	Definition
AnalyzerRangeCode	AnalyzerRangeCodeType	Code used to identify the analyzer range.
DualRangeIndicator	IndicatorType	Used to indicate whether the component is a dual-range analyzer.
BeginDate	OptionalDateType	Date in which information became effective or activity started.
BeginHour	OptionalHourType	Hour in which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective or date in which activity ended.
EndHour	OptionalHourType	Last hour in which information was effective or hour in which activity ended.

**Figure 6
ComponentData**



**Figure 7
ComponentData XML Elements**

XML Tag	Type	Definition
ComponentID	RequiredIdentifierType	The three digit code assigned by the source to identify the component.
ComponentTypeCode	ComponentTypeCode Type	Code used to identify the component type.
SampleAcquisitionMethodCode	AcquisitionMethodCode Type	Code used to identify the sample acquisition method.
BasisCode	BasisCodeType	Code used to identify the moisture basis.
Manufacturer	ManufacturerType	Name of the manufacturer or developer of the component.
ModelVersion	ModelVersionType	The model of any hardware component or the version number of the software component.
SerialNumber	SerialNumberType	Serial number of the component.
HgConverterIndicator	IndicatorType	Code used to indicate that the Hg analyzer has a converter.

**Figure 8
MonitoringDefaultData**

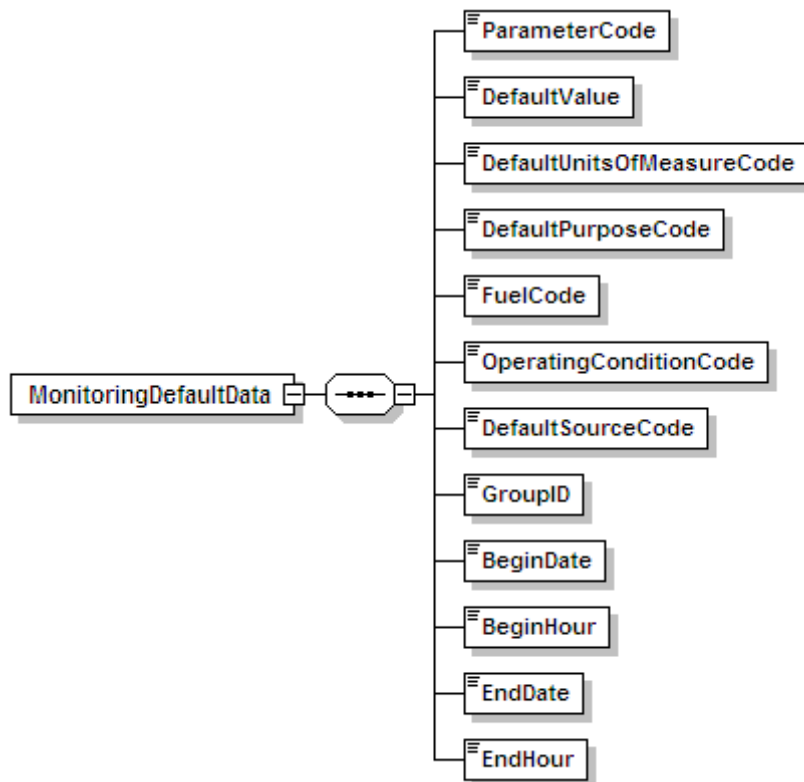


Figure 9
MonitoringDefaultData XML Elements

XML Tag	Type	Definition
ParameterCode	DefaultParameterCode Type	Code used to identify the parameter.
DefaultValue	DefaultValueType	Value of default, maximum, minimum, or constant.
DefaultUnitsOfMeasureCode	DefaultUnitsOfMeasure CodeType	Code used to identify the hourly parameter units of measure.
DefaultPurposeCode	DefaultPurposeCode Type	Code used to identify the purpose or intended use of defaults, maximums, and constants.
FuelCode	FuelCodeType	Code used to identify the type of fuel.
OperatingCondition Code	OperatingCondition CodeType	Code used to identify the operating condition.
DefaultSourceCode	DefaultSourceCodeType	Code used to identify the source of the default value.
GroupID	GroupIDType	For a group of identical units using testing to determine default NO _x rate, this ID identifies the group.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
BeginHour	RequiredHourType	Hour in which information became effective.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records.

Figure 10
MonitoringFormulaData

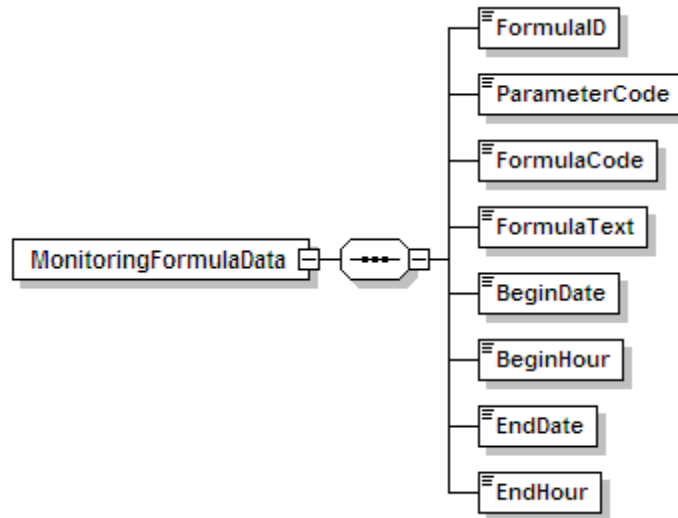


Figure 11
MonitoringFormulaData XML Elements

XML Tag	Type	Definition
FormulaID	RequiredFormulaIdentifierType	The three character formula ID assigned by the source.
ParameterCode	FormulaParameterCodeType	Code used to identify the parameter.
FormulaCode	EquationCodeType	Code used to identify the equation as defined in Part 75.
FormulaText	FormulaTextType	The equation used to calculate the parameter.
BeginDate	OptionalDateType	Date on which information became effective or activity started.
BeginHour	OptionalHourType	Hour in which information became effective.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records.

Figure 12
MonitoringLoadData

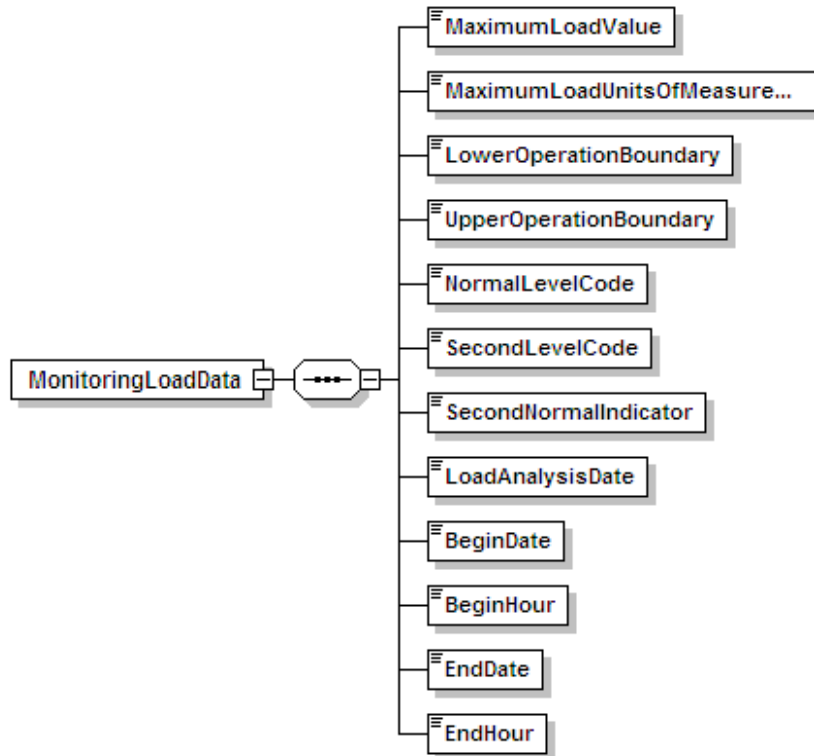


Figure 13
MonitoringLoadData XML Elements

XML Tag	Type	Definition
MaximumLoadValue	MaximumLoadValue Type	Maximum hourly gross load.
MaximumLoadUnitsOfMeasureCode	MaximumLoadUnitsOf MeasureCodeType	Code used to identify the units of measure for maximum load value.
LowerOperation Boundary	LowerOperation BoundaryType	Lower boundary of range of operation.
UpperOperation Boundary	UpperOperation BoundaryType	Upper boundary of range of operation.
NormalLevelCode	LevelCodeType	Code used to identify the normal load or operating level.
SecondLevelCode	LevelCodeType	Code used to identify the second most frequently used load or operating level.
SecondNormalIndicator	IndicatorType	Used to indicate the reporting of an additional normal load or a second operating level.

(cont.)

Figure 13
MonitoringLoadData XML Elements (cont.)

XML Tag	Type	Definition
LoadAnalysisDate	OptionalDateType	The date in which load analysis was performed. This date only applies to CEM and Appendix D locations.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
BeginHour	RequiredHourType	Hour in which information became effective.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records.

Figure 14
MonitoringLocationData

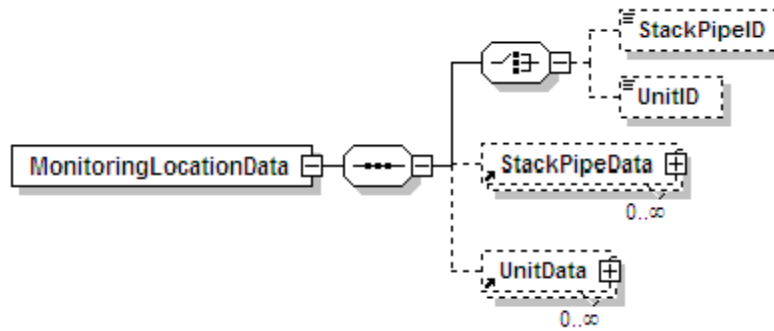


Figure 15
MonitoringLocationData XML Elements

XML Tag	Type	Definition
StackPipeID	RequiredStackPipeType	Three to six alphanumeric character code which is assigned by the source to identify a stack or pipe.
UnitID	RequiredUnitType	One to six alphanumeric character code assigned by the source to identify a unit.

Figure 16
MonitoringLocationAttribData

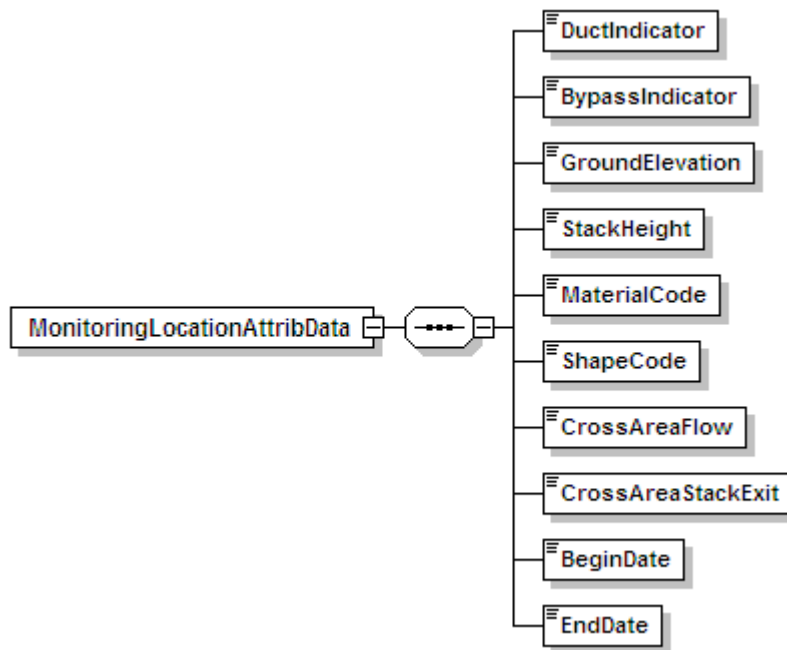


Figure 17
MonitoringLocationAttribData XML Elements

XML Tag	Type	Definition
DuctIndicator	IndicatorType	Used to indicate that this location is a duct.
BypassIndicator	IndicatorType	Used to indicate that the stack is used for bypass.
GroundElevation	GroundElevationType	The number of feet above sea level at ground level of the stack or unit.
StackHeight	StackHeightType	The height in feet of a stack exit above ground level.
MaterialCode	MaterialCodeType	Code used to identify the material that is used in the monitoring location.
ShapeCode	ShapeCodeType	Code identifying the shape of a monitor location.
CrossAreaFlow	CrossAreaFlowType	The reported inside cross-sectional area in square feet of the stack or duct at the flow monitoring location.
CrossAreaStackExit	CrossAreaStackExit Type	The inside cross-sectional area in square feet of the stack at the exit.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.

Figure 18
MonitoringMethodData

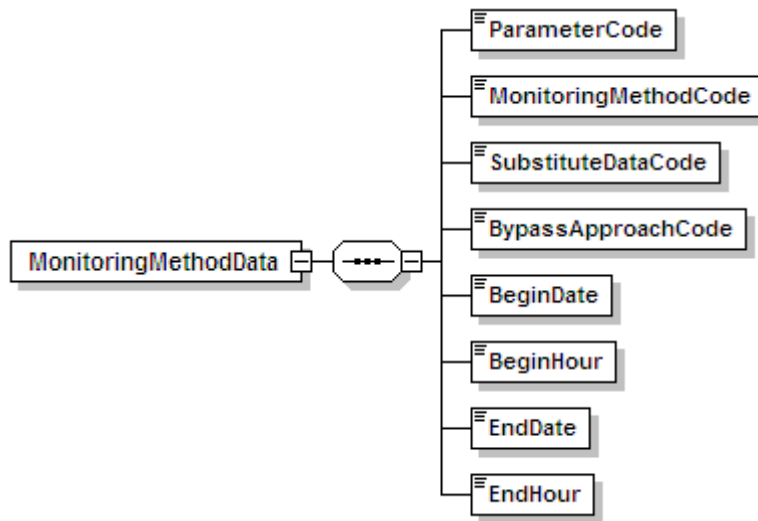


Figure 19
MonitoringMethodData XML Elements

XML Tag	Type	Definition
ParameterCode	MethodParameterCode Type	Code used to identify the parameter.
MonitoringMethodCode	MethodCodeType	Code used to identify the monitoring methodology.
SubstituteDataCode	SubstituteDataCodeType	Code used to identify the substitute data approach type.
BypassApproachCode	BypassApproachCode Type	Code used to identify the value to be used for an unmonitored bypass stack.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
BeginHour	RequiredHourType	Hour in which information became effective.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records.

Figure 20
MonitoringPlanCommentData

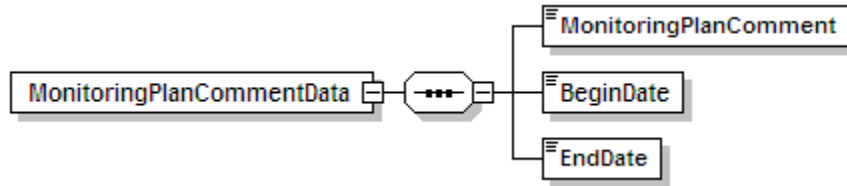


Figure 21
MonitoringPlanCommentData XML Elements

XML Tag	Type	Definition
MonitoringPlanComment	MonitoringPlan CommentType	Comment on a monitoring plan.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.

Figure 22
MonitoringQualificationData

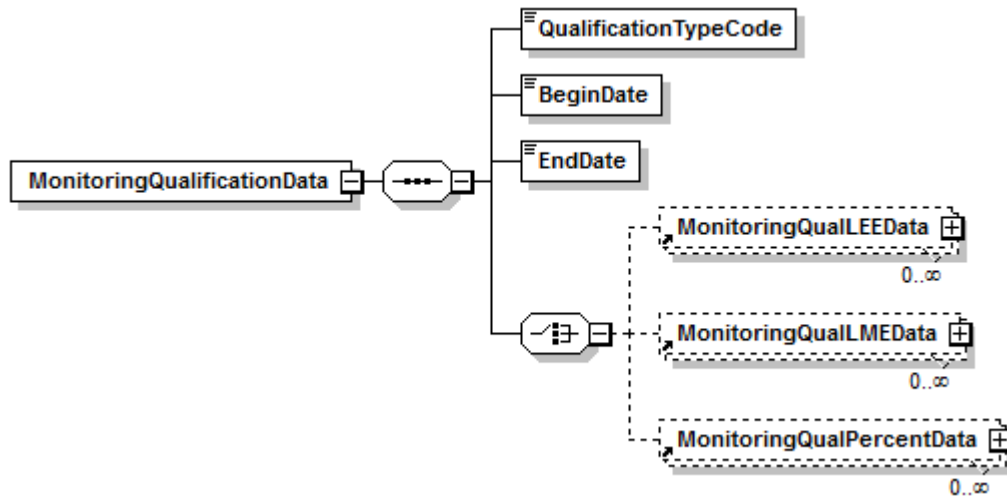
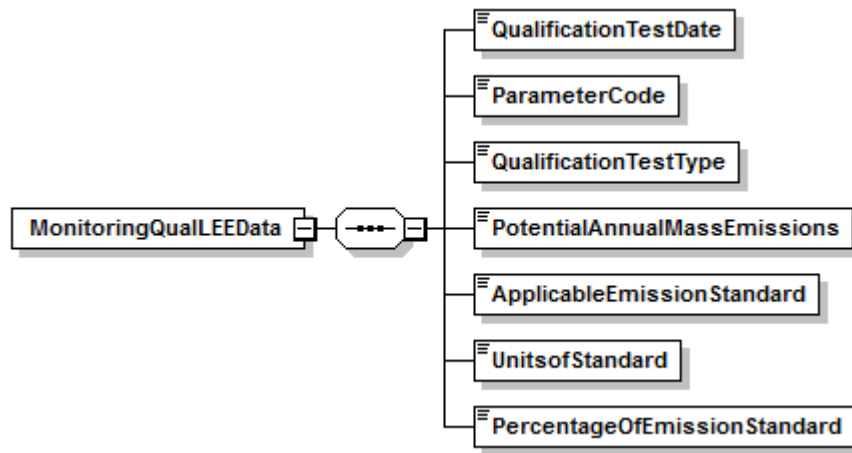


Figure 23
MonitoringQualificationData XML Elements

XML Tag	Type	Definition
QualificationTypeCode	QualTypeCodeType	Code used to identify the qualification type.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.

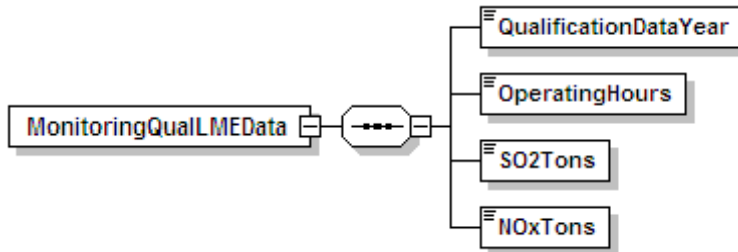
Figure 24
MonitoringQualLEEData



**Figure 25
MonitoringQualLEE Data XML Elements**

XML Tag	Type	Definition
QualificationTestData	RequiredDateType	The end date of the demonstration test.
ParameterCode	MATSLEEPParameterCodeType	Code used to identify the parameter.
QualificationTestType	QualTestCodeType	Indicates if a qualification test is the initial demonstration test or a retest.
PotentialAnnualMassEmissions	HgLbsType	Calculated annual emissions in pounds rounded to one decimal place.
ApplicableEmissionStandard	QualLEEAApplicableEmissionsType	Numerical value of applicable emissions standard.
UnitsofStandard	QualLEEUnitsofMeasureCodeType	Units of measure of the applicable emission standard.
PercentageOfEmissionStandard	PercentageValueType	The results of the demonstration test as a percentage of the standard, rounded to one decimal place.

**Figure 26
MonitoringQualLMEData**



**Figure 27
MonitoringQualLMEData XML Elements**

XML Tag	Type	Definition
QualificationDataYear	RequiredYearType	Year corresponding to the qualification data.
OperatingHours	OperatingHoursType	Annual number of operating hours used to determine qualification.
SO2Tons	SO2TonsType	Annual SO ₂ value used to determine qualification.
NOxTons	NOxTonsType	Annual NO _x emissions to determine qualification.

Figure 28
MonitoringQualPercentData

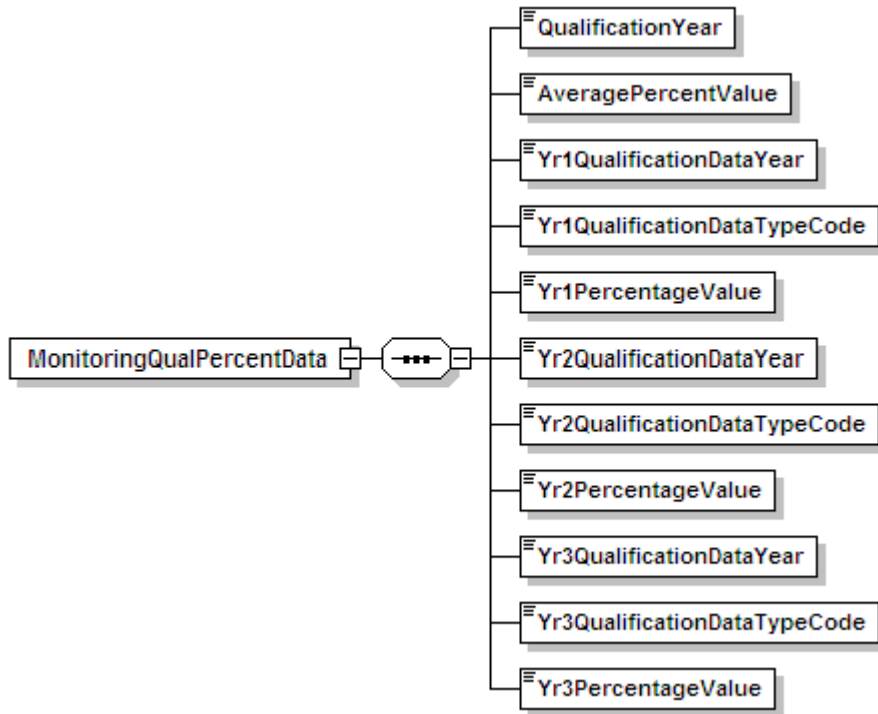


Figure 29
MonitoringQualPercentData XML Elements

XML Tag	Type	Definition
QualificationYear	RequiredYearType	Year corresponding to the qualification data.
AveragePercentValue	AveragePercentValue Type	The average percent capacity or heat input usage.
Yr1QualificationData Year	OptionalYearType	The first year corresponding to the qualification data.
Yr1QualificationData TypeCode	QualDataTypeCodeType	Code used to indicate type of data for year one (actual or projected) used to determine peaking or gas-fired qualification.
Yr1PercentageValue	PercentageValueType	The percent capacity or heat input usage in the first year.
Yr2QualificationData Year	OptionalYearType	The second year corresponding to the qualification data.
Yr2QualificationData TypeCode	QualDataTypeCodeType	Code used to indicate type of data for year two (actual or projected) used to determine peaking or gas-fired qualification.

(cont.)

Figure 29
MonitoringQualPercentData XML Elements (cont.)

Yr2PercentageValue	PercentageValueType	The percent capacity or heat input usage in the second year.
Yr3QualificationData Year	OptionalYearType	The third year corresponding to the qualification data.
Yr3QualificationData TypeCode	QualDataTypeCodeType	Code used to indicate type of data for year three (actual or projected) used to determine peaking or gas-fired qualification.
Yr3PercentageValue	PercentageValueType	The percent capacity or heat input usage in the third year.

Figure 30
MonitoringSpanData

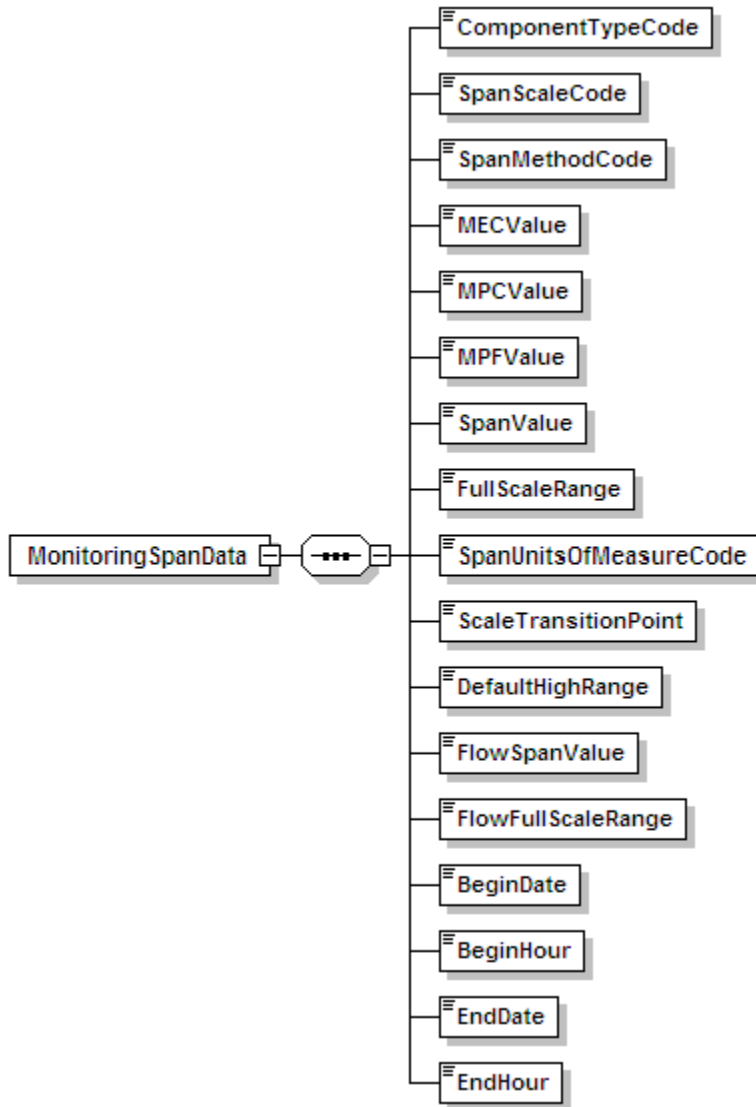


Figure 31
MonitoringSpanData XML Elements

XML Tag	Type	Definition
ComponentTypeCode	SpanComponentTypeCodeType	Code used to indicate the component type.
SpanScaleCode	SpanScaleCodeType	Code used to identify the span scale.
SpanMethodCode	SpanMethodCodeType	Code used to identify the method used to calculate MPC/MEC/MPF.
MECValue	MECValueType	Maximum expected concentration (MEC).
MPCValue	MPCValueType	Maximum potential concentration (MPC).
MPFValue	MPFValueType	Maximum Potential Flow (MPF).
SpanValue	SpanValueType	Span value in units of daily calibration.
FullScaleRange	FullScaleRangeType	Full scale range in units of daily calibration.
SpanUnitsOfMeasureCode	SpanUnitsOfMeasureCodeType	Code used to identify the calibration units of measure.
ScaleTransitionPoint	ScaleTransitionPointType	Maximum value determined by low-scale of a dual-range analyzer.
DefaultHighRange	DefaultHighRangeType	Default High Range value.
FlowSpanValue	FlowSpanValueType	Flow rate span value in SCFH.
FlowFullScaleRange	FlowFullScaleRangeType	Flow rate full scale value in SCFH.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
BeginHour	RequiredHourType	Hour in which information became effective.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records.

Figure 32
MonitoringSystemData

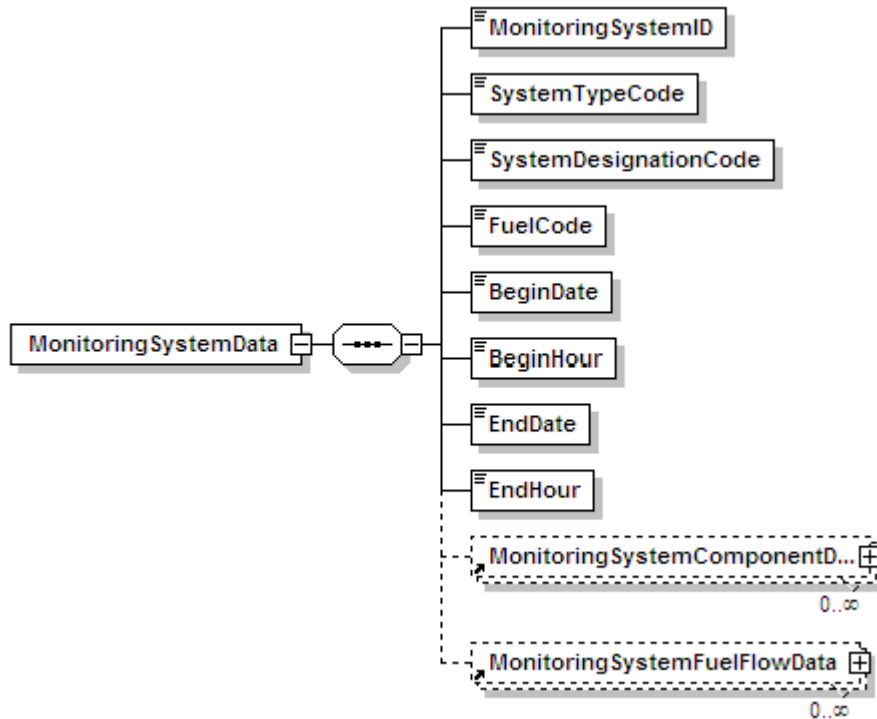


Figure 33
MonitoringSystemData XML Elements

XML Tag	Type	Definition
MonitoringSystemID	RequiredIdentifierType	The three digit code used by the source to identify the monitoring system.
SystemTypeCode	SystemTypeCodeType	Code used to identify the type (parameter) of the system.
SystemDesignationCode	SystemDesignationCode Type	Code used to indicate designation of monitoring system as primary, backup, etc.
FuelCode	SystemFuelCodeType	Code used to identify the type of fuel.
BeginDate	OptionalDateType	Date on which information became effective or activity started.
BeginHour	OptionalHourType	Hour in which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records.

Figure 34
MonitoringSystemComponentData

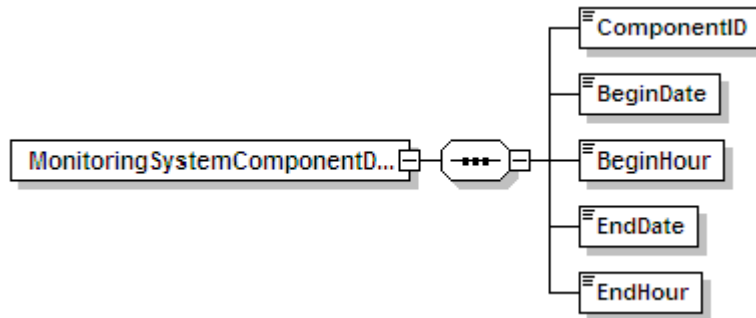


Figure 35
MonitoringSystemComponentData XML Elements

XML Tag	Type	Definition
ComponentID	RequiredIdentifierType	The three digit code assigned by the source to identify the component.
BeginDate	OptionalDateType	Date on which information became effective or activity started.
BeginHour	OptionalHourType	Hour in which information became effective.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records.

Figure 36
MonitoringSystemFuelFlowData

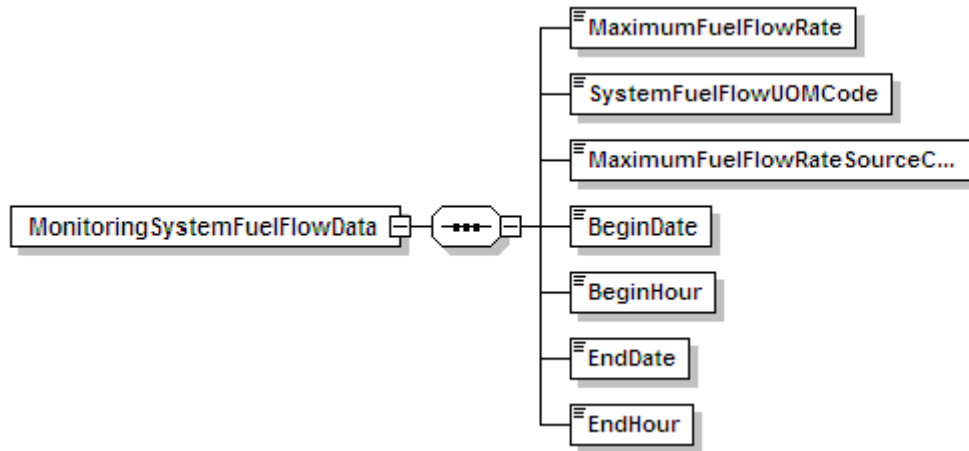


Figure 37
MonitoringSystemFuelFlowData XML Elements

XML Tag	Type	Definition
MaximumFuelFlowRate	MaximumFuelFlowRateType	Maximum fuel flow rate.
SystemFuelFlowUOMCode	SystemFuelFlowUOM CodeType	Code used to identify the fuel flow units of measure.
MaximumFuelFlowRateSourceCode	MaxRateSourceCodeType	Code used to identify the source of maximum fuel flow.
BeginDate	OptionalDateType	Date on which information became effective or activity started.
BeginHour	OptionalHourType	Hour in which information became effective.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective or hour in which activity ended. This value will be null for active records.

Figure 38
RectangularDuctWAFData

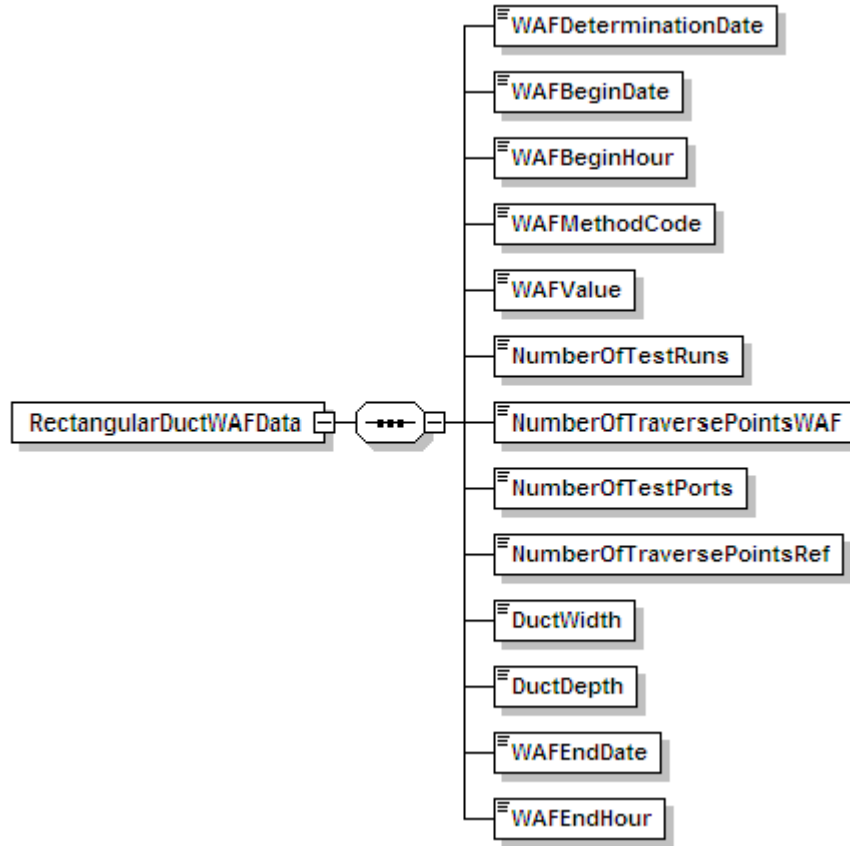


Figure 39
RectangularDuctWAFData XML Elements

XML Tag	Type	Definition
WAFDeterminationDate	OptionalDateType	The date the WAF applied was determined.
WAFBeginDate	RequiredDateType	The date on which the WAF was first applied to the flow rate data.
WAFBeginHour	RequiredHourType	The hour in which the WAF was first applied to the flow rate data.
WAFMethodCode	WAFMethodCodeType	Code used to identify the WAF determination method.
WAFValue	WAFValueType	The WAF applied to the flow rate data, to four decimal places.
NumberOfTestRuns	NumberOfTestRuns Type	The number of runs in the WAF test (must be one for default WAF and at least three for a measured WAF).

(cont.)

Figure 39
RectangularDuctWAFData XML Elements (cont.)

XML Tag	Type	Definition
NumberOfTraversePointsWAF	NumberOfTraversePointsWAFType	The number of Method 1 traverse points in the WAF test runs.
NumberOfTestPorts	NumberOfTestPortsType	The number of test ports at which measurements were made during the WAF test runs.
NumberOfTraversePointsRef	NumberOfTraversePointsRefType	The number of Method 1 traverse points in the "reference" flow RATA test runs.
DuctWidth	DuctWidthType	The width of the rectangular duct at the test location to the nearest 0.1 ft (i.e., dimension Lx in Figure 1 of CTM-041).
DuctDepth	DuctDepthType	The depth of the rectangular duct at the test location to the nearest 0.1 ft (i.e., dimension Ly in Figure 1 of CTM-041).
WAFEndDate	OptionalDateType	The date on which the WAF was last applied to the flow rate data.
WAFEndHour	OptionalHourType	The hour in which the WAF was last applied to the flow rate data.

Figure 40
StackPipeData



Figure 41
StackPipeData XML Elements

XML Tag	Type	Definition
ActiveDate	RequiredDateType	The date that emissions first went through the stack or the effective date for data reporting.
RetireDate	OptionalDateType	The actual date that the stack or pipe was last used for emissions measurement or estimation purposes.

Figure 42
SupplementalMATSMonitoringMethodData

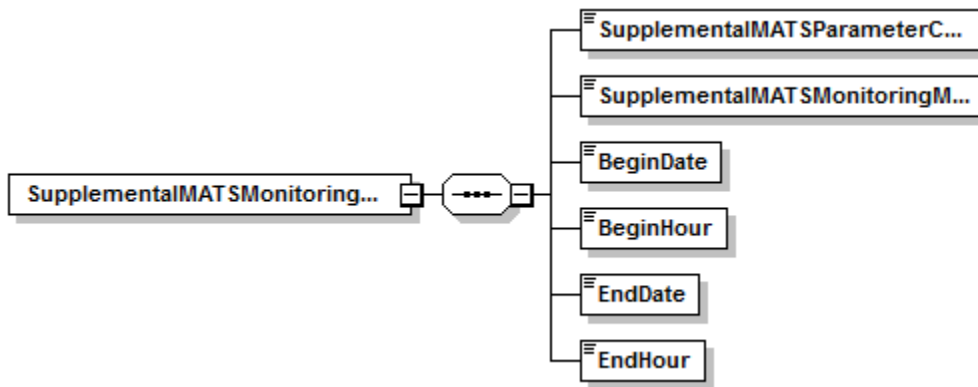
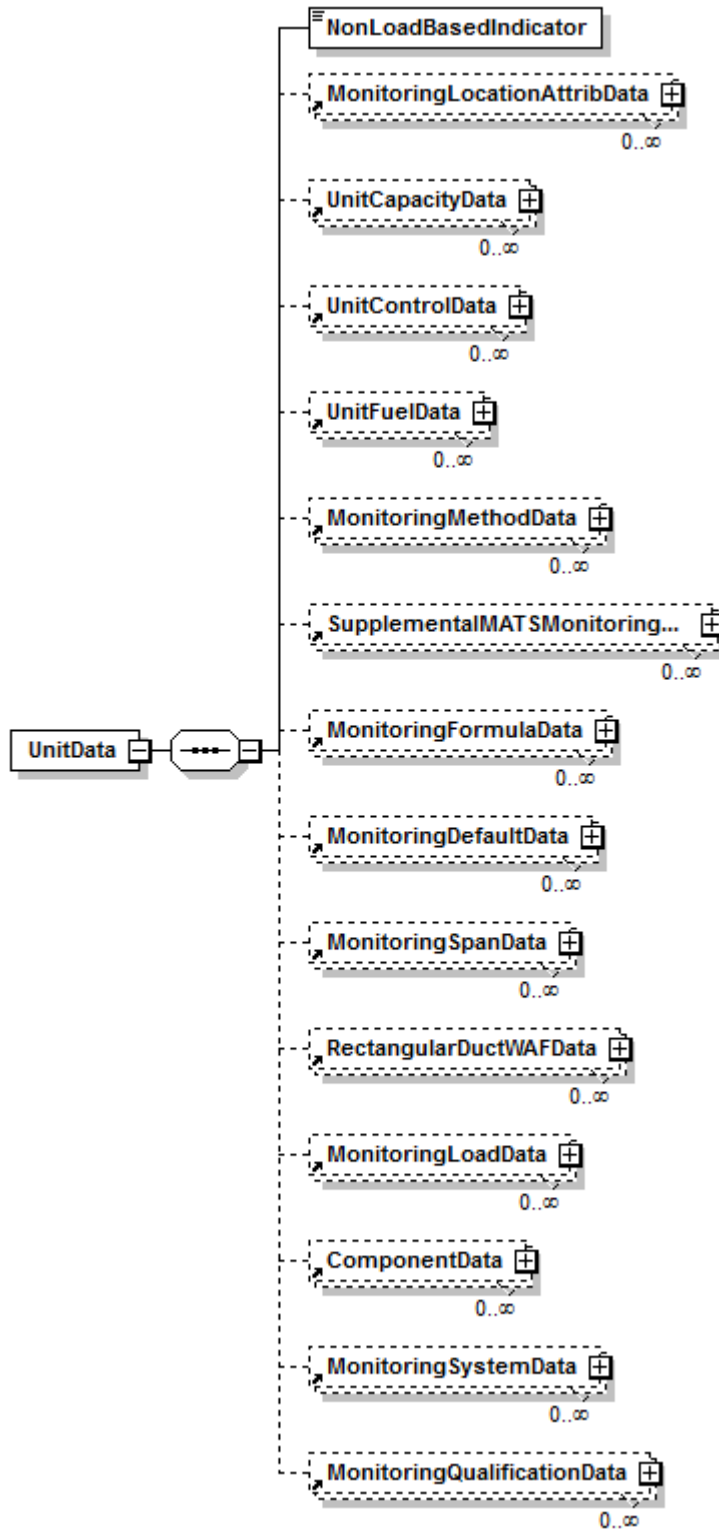


Figure 43
SupplementalMATSMonitoringMethodData XML Elements

XML Tag	Type	Definition
SupplementalMATSPParameterCode	SupplementalMATSPParameterCodeType	Appropriate parameter code
SupplementalMATSMonitoringMethodCode	SupplementalMATSMonitoringMethodCodeType	Compliance method employed for each applicable parameter
BeginDate	RequiredDateType	Date on which information became effective or activity started.
BeginHour	RequiredHourType	Hour in which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.
EndHour	OptionalHourType	Last hour in which information was effective. This value will be null for active records

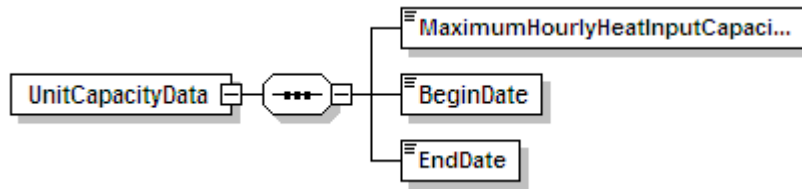
Figure 44
UnitData



**Figure 45
UnitData XML Elements**

XML Tag	Type	Definition
NonLoadBasedIndicator	IndicatorType	Used to indicate whether the unit is non-load based.

**Figure 46
UnitCapacityData**



**Figure 47
UnitCapacityData XML Elements**

XML Tag	Type	Definition
MaximumHourlyHeatInputCapacity	MaximumHourlyHeat InputCapacityType	The maximum hourly heat input (mmBtu/hr) for the unit.
BeginDate	RequiredDateType	Date in which information became effective or activity started.
EndDate	OptionalDateType	Date on which a relationship or an activity ended.

**Figure 48
UnitControlData**

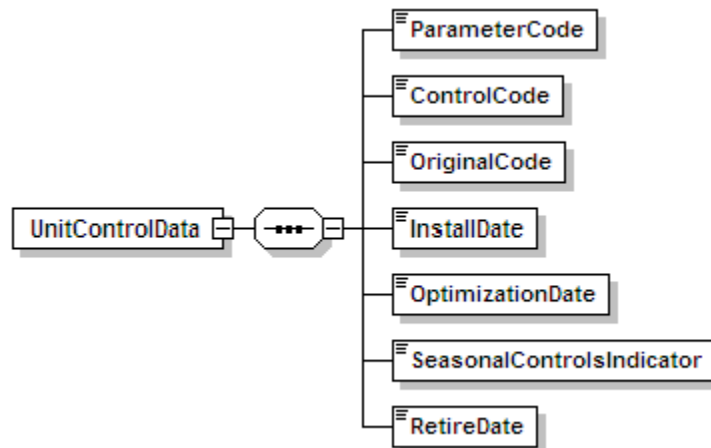


Figure 49
UnitControlData XML Elements

XML Tag	Type	Definition
ParameterCode	UnitControlParameterCodeType	Code used to identify the continuous emissions parameter for the control.
ControlCode	ControlCodeType	Code used to identify the control type.
OriginalCode	IndicatorType	Used to indicate that the control equipment was installed and operated as part of the original unit design.
InstallDate	OptionalDateType	Date on which information became effective or activity started.
OptimizationDate	OptionalDateType	The approximate date on which optimization of control equipment was completed and the equipment made fully operational if the control equipment was not part of the original installation.
SeasonalControlsIndicator	IndicatorType	Used to indicate that the NO _x control equipment is used during the ozone season.
RetireDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.

Figure 50
UnitFuelData

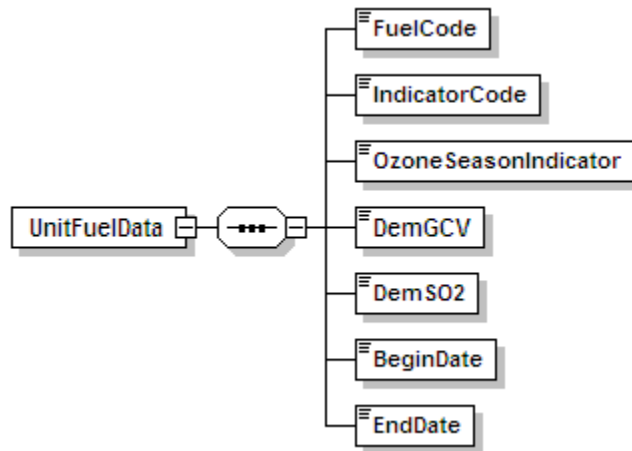


Figure 51
UnitFuelData XML Elements

XML Tag	Type	Definition
FuelCode	UnitFuelCodeType	Code used to identify the type of fuel which the unit is capable or will be capable of combusting.
IndicatorCode	IndicatorCodeType	Code used to identify the fuel usage (primary or secondary).
OzoneSeasonIndicator	IndicatorType	Used to indicate that the fuel is used during ozone season.
DemGCV	DemMethodCodeType	Demonstration method to qualify for monthly fuel sampling for GCV.
DemSO2	DemSO2Type	Demonstration method to qualify for daily fuel sampling for percent sulfur.
BeginDate	RequiredDateType	Date in which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective. This date will be null for active records.

Figure 52
UnitStackConfigurationData

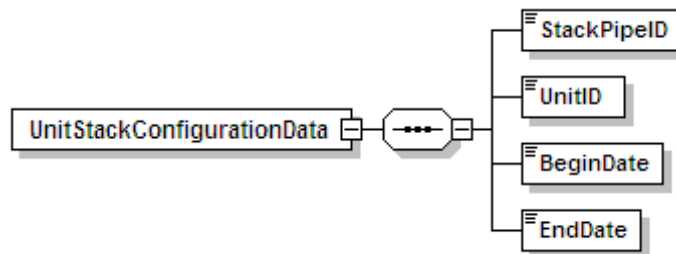


Figure 53
UnitStackConfigurationData XML Elements

XML Tag	Type	Definition
StackPipeID	RequiredStackPipeType	Three to six alphanumeric character code which is assigned by the source to identify a stack or pipe.
UnitID	RequiredUnitType	One to six alphanumeric character code assigned by the source to identify a unit.
BeginDate	RequiredDateType	Date on which information became effective or activity started.
EndDate	OptionalDateType	Last date in which information was effective or date in which activity ended.

Figure 54
Simple Types Used for Validation

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
Acquisition MethodCode Type	ComponentData/ SampleAcquisitionMethodCode	String	Yes	ADSP COR DIL DIN DOD DOU DP EXT IS ISC ISP NOZ O ORF PDP T TUR U VCON VEN VTX WXT	
AnalyzerRange CodeType	AnalyzerRangeData/ AnalyzerRangeCode	String	No	A H L	
AveragePercent ValueType	MonitoringQualPercent Data/ AveragePercentValue	Decimal	Yes	Total Digits = 5 Decimal Places = 1	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
BasisCodeType	ComponentData/Basis Code	String	Yes	B D W	
BypassApproach CodeType	MonitoringMethodData/ BypassApproachCode	String	Yes	BYMAX BYMAXFS	
ComponentType CodeType	ComponentData/ ComponentTypeCode	String	No	BGFF BOFF CALR CO2 DAHS DL DP FLC FLOW GCH GFFM H2O HCL HF HG MS NOX O2 OFFM OP PLC PM PRB PRES SO2 STRAIN TANK TEMP	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
ControlCodeType	UnitControlData/ ControlCode	String	No	APAC B C CAT CM DA DL DLNB DSI ESP FBL H2O HESP HPAC LNB LNBO LNC1 LNC2 LNC3 LNCB MO NH3 O OFA SORB REAC SB SCR SNCR STM UPAC WESP WL WLS WS	
CrossAreaFlow Type	MonitoringLocation AttribData/ CrossAreaFlow	Decimal	Yes	Total Digits = 4 Decimal Places = 0	
CrossAreaStack ExitType	MonitoringLocationAttrib Data/ CrossAreaStackExit	Decimal	Yes	Total Digits = 4 Decimal Places = 0	
DefaultHigh RangeType	MonitoringSpanData/ DefaultHighRange	Decimal	Yes	Total Digits = 5 Decimal Places = 0	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
DefaultParameter CodeType	MonitoringDefaultData/ ParameterCode	String	No	CO2N CO2R CO2X FLOX H2O H2ON H2OX MHHI MNGF MNHI MNNX MNOF NOCX NORX NOXR O2N O2X SO2R SO2X SORX	
DefaultPurpose CodeType	MonitoringDefaultData/ DefaultPurposeCode	String	Yes	DC DM F23 LM MD PM	
DefaultSource CodeType	MonitoringDefaultData/ DefaultSourceCode	String	Yes	APP CONT DATA DEF MAXD PERM SAMP TEST	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
DefaultUnitsOfMeasureCode Type	MonitoringDefaultData/DefaultUnitsOfMeasureCode	String	Yes	BBLHR GALHR HSCF LBHR LBMMBTU M3HR MMBTUHR PCT PPM SCFH TNMMBTU	
DefaultValue Type	MonitoringDefaultData/DefaultValue	Decimal	No	Total Digits = 15 Decimal Places = 4	
DemMethodCode Type	UnitFuelData/ DemGCV	String	Yes	GGC GHS GOC	
DemSO2Type	UnitFuelData/ DemSO2	String	Yes	SGC SHS	
DuctDepthType	RectangularDuctWAFData/ DuctDepth	Decimal	Yes	Total Digits = 5 Decimal Places = 1	
DuctWidthType	RectangularDuctWAFData/ DuctWidth	Decimal	Yes	Total Digits = 5 Decimal Places = 1	
EquationCode Type	MonitoringFormulaData/ FormulaCode	String	Yes	19-1 19-14 19-2 19-3 19-3D 19-4 19-5 19-5D 19-6 19-7 19-8 19-9 A-2 A-3 A-4 D-12 D-15 D-15A D-1H	

(cont.)

**Figure 54
Simple Types Used for Validation (cont.)**

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
EquationCode Type (cont.)	MonitoringFormulaData /FormulaCode	String	Yes	D-2 D-3 D-4 D-5 D-6 D-8 E-2 F-1 F-11 F-14A F-14B F-15 F-16 F-17 F-18 F-19 F-19V F-2 F-20 F-21A F-21B F-21C F-21D F-23 F-24A F-25 F-26A F-26B F-28 F-29 F-31 F-5 F-6 F-7A F-7B F-8 G-1 G-2 G-3 G-4 G-4A G-5 G-6 G-8	

(cont.)

**Figure 54
Simple Types Used for Validation (cont.)**

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
EquationCode Type (cont.)	MonitoringFormulaData/ FormulaCode	String	Yes	HC-2 HC-3 HC-4 HF-2 HF-3 HF-4 K-5 M-1K MS-1 N-GAS N-OIL NS-1 NS-2 S-2 S-3 S-4 SS-1A SS-1B SS-2A SS-2B SS-2C SS-3A SS-3B T-FL X-FL	
FlowFullScale RangeType	MonitoringSpanData/ FlowFullScaleRange	Decimal	Yes	Total Digits = 10 Decimal Places = 0	
FlowSpanValue Type	MonitoringSpanData/ FlowSpanValue	Decimal	Yes	Total Digits = 10 Decimal Places = 0	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
FormulaParameterCodeType	MonitoringFormulaData/ParameterCode	String	No	CO2 CO2C CO2M FC FD FGAS FLOW FOIL FW H2O HCLRE HCLRH HFRE HFRH HGRE HGRH HI HIT NOX NOXR OILM SO2 SO2R SO2RE SO2RH	
FormulaTextType	MonitoringFormulaData/FormulaText	String	No	Minimum Length = 0 Maximum Length = 200 characters	
FuelCodeType	MonitoringDefaultData/FuelCode	String	Yes	ANT BFG BT BUT C CDG COG CRF DGG DSL LFG LIG LPG MIX NFS NNG	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
FuelCodeType (cont.)	MonitoringDefaultData/ FuelCode	String	Yes	OGS OIL OOL OSF PDG PNG PRG PRP PRS PTC R RFG SRG SUB TDF W WL	
FullScaleRange Type	MonitoringSpanData/ FullScaleRange	Decimal	Yes	Total Digits = 13 Decimal Places = 3	
GroundElevation Type	MonitoringLocation AttribData/ GroundElevation	Decimal	Yes	Total Digits = 5 Decimal Places = 0	
GroupIDType	MonitoringDefaultData/ GroupID	String	Yes	Maximum Length = 10 characters	
HgLbsType	MonitoringQualLEEData/ PotentialAnnualMassEmissi ons	Decimal	Yes	Total Digits = 5 Decimal Places = 1	
IndicatorCode Type	UnitFuelData/ IndicatorCode	String	Yes	E I P S	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
IndicatorType	AnalyzerRangeData/ DualRangeIndicator ComponentData/ HgConverterIndicator MonitoringLoadData/ SecondNormalIndicator MonitoringLocationAttribD ata/ BypassIndicator MonitoringLocationAttribD ata/ DuctIndicator UnitControlData/ OriginalCode UnitControlData/ SeasonalControlsIndicator UnitData/ NonLoadBasedIndicator UnitFuelData/ OzoneSeasonIndicator	String	Yes	0 1	
LevelCodeType	MonitoringLoadData/ NormalLevelCode MonitoringLoadData/ SecondLevelCode	String	Yes	H L M	
LowerOperation BoundaryType	MonitoringLoadData/ LowerOperation Boundary	Decimal	Yes	Total Digits = 6 Decimal Places = 0	
Manufacturer Type	ComponentData/ Manufacturer	String	No	Maximum Length = 25 characters	
MaterialCode Type	MonitoringLocationAttrib Data/ MaterialCode	String	Yes	BRICK OTHER	
MATSLEEPParam eterCodeType	MonitoringQualLEEData/ ParameterCode	String	No	HCL HF HG	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
MaximumFuelFlowRateType	MonitoringSystemFuelFlowData/ MaximumFuelFlowRate	Decimal	No	Total Digits = 9 Decimal Places = 1	
MaximumHourlyHeatInputCapacityType	UnitCapacityData/ MaximumHourlyHeatInputCapacity	Decimal	Yes	Total Digits = 7 Decimal Places = 1	
MaximumLoadUnitsOfMeasureCodeType	MonitoringLoadData/ MaximumLoadUnitsOfMeasureCode	String	Yes	KLBHR MMBTUHR MW	
MaximumLoadValueType	MonitoringLoadData/ MaximumLoadValue	Decimal	Yes	Total Digits = 6 Decimal Places = 0	
MaxRateSourceCodeType	MonitoringSystemFuelFlowData/ MaximumFuelFlowRateSourceCode	String	Yes	UMX URV	
MECValueType	MonitoringSpanData/ MECValue	Decimal	Yes	Total Digits = 6 Decimal Places = 1	
MethodCodeType	MonitoringMethodData/ MonitoringMethodCode	String	No	AD ADCALC AE AMS CALC CEM CEMF23 CEMNOXR CEMST COM EXP F23 FSA LME LTFCALC LTFE MDF MHHI MMS MTB MWD NOXR PEM ST	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
MethodParameterCodeType	MonitoringMethodData/ParameterCode	String	No	CO2 CO2M H2O HCLRH HFRE HFRH HGRE HGRH HI HIT NOX NOXM NOXR OP SO2 SO2M SO2RE SO2RH	
ModelVersionType	ComponentData/ModelVersion	String	No	Maximum Length = 15 characters	
MonitoringPlanCommentType	MonitoringPlanCommentData/MonitoringPlanComment	String	No	Minimum Length = 1 Maximum Length = 4,000 characters	
MPCValueType	MonitoringSpanData/MPCValue	Decimal	Yes	Total Digits = 6 Decimal Places = 1	
MPFValueType	MonitoringSpanData/MPFValue	Decimal	Yes	Total Digits = 10 Decimal Places = 0	
NOxTonsType	MonitoringQualLMEDData/NOxTons	Decimal	Yes	Total Digits = 4 Decimal Places = 1	
NumberOfTestPortsType	RectangularDuctWAFData/NumberOfTestPorts	Decimal	Yes	Total Digits = 2 Decimal Places = 0	
NumberOfTestRunsType	RectangularDuctWAFData/NumberOfTestRuns	Decimal	Yes	Total Digits = 2 Decimal Places = 0	
NumberOfTraversePointsRefType	RectangularDuctWAFData/NumberOfTraversePointsRef	Decimal	Yes	Total Digits = 2 Decimal Places = 0	

(cont.)

**Figure 54
Simple Types Used for Validation (cont.)**

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
NumberOf TraversePoints WAFType	RectangularDuctWAFData/ NumberOfTraversePointsW AF	Decimal	Yes	Total Digits = 2 Decimal Places = 0	
Operating ConditionCode Type	MonitoringDefaultData/ OperatingConditionCode	String	Yes	A B C P U	
OperatingHours Type	MonitoringQualLMEDData/ OperatingHours	Integer	Yes		Must be an integer.
OptionalDate Type	AnalyzerRangeData/ BeginDate AnalyzerRangeData/ EndDate MonitoringDefaultData/ EndDate MonitoringFormulaData/ BeginDate MonitoringFormulaData/ EndDate MonitoringLoadData/ EndDate MonitoringLoadData/ LoadAnalysisDate MonitoringLocationAttrib Data/ EndDate MonitoringMethodData/ EndDate MonitoringPlan CommentData/ EndDate MonitoringQualification Data/ EndDate	Date	Yes		Must be a date.

(cont.)

**Figure 54
Simple Types Used for Validation (cont.)**

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
OptionalDate Type (cont.)	MonitoringSpanData/ EndDate MonitoringSystemComponentData/ BeginDate MonitoringSystemComponentData/ EndDate MonitoringSystemData/ BeginDate MonitoringSystemData/ EndDate MonitoringSystemFuelFlowData/ BeginDate MonitoringSystemFuelFlowData/ EndDate RectangularDuctWAFData/ WAFDeterminationDate RectangularDuctWAFData/ WAFEndDate StackPipeData/ RetireDate SupplementalMATSMonitoringMethodData/ EndDate UnitCapacityData/ EndDate UnitControlData/ InstallDate UnitControlData/ OptimizationDate UnitControlData/ RetireDate UnitFuelData/ EndDate UnitStackConfigurationData / EndDate	Date	Yes		Must be a date.

(cont.)

**Figure 54
Simple Types Used for Validation (cont.)**

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
OptionalHour Type	AnalyzerRangeData/ BeginHour AnalyzerRangeData/ EndHour MonitoringDefaultData/ EndHour MonitoringFormulaData/ BeginHour MonitoringFormulaData/ EndHour MonitoringLoadData/ EndHour MonitoringMethodData/ EndHour MonitoringSpanData/ EndHour MonitoringSystem ComponentData/ BeginHour MonitoringSystem ComponentData/ EndHour MonitoringSystemData/ BeginHour MonitoringSystemData/ EndHour MonitoringSystemFuel FlowData/ BeginHour MonitoringSystemFuel FlowData/ EndHour	Integer	Yes	Minimum Value (inclusive) = 0 Maximum Value (inclusive) = 23	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
OptionalHour Type	RectangularDuctWAFData/ WAFEndHour SupplementalMATSMonitoringMethodData/ EndHour	Integer	Yes	Minimum Value (inclusive) = 0 Maximum Value (inclusive) = 23	
OptionalYear Type	MonitoringQualPercentData / Yr1QualificationData Year MonitoringQualPercentData / Yr2QualificationData Year MonitoringQualPercentData / Yr3QualificationData Year	Integer	Yes	Minimum Value (inclusive) = 1940 Maximum Value (inclusive) = 2050	Four-digit year between 1940 and 2050
ORISCodeType	MonitoringPlan/ORISCode	Integer	No	Minimum Value (inclusive) = 1 Maximum Value (inclusive) = 999999	
PercentageValue Type	MonitoringQualPercentData / Yr1PercentageValue MonitoringQualPercentData / Yr2PercentageValue MonitoringQualPercentData / Yr3PercentageValue	Decimal	Yes	Total Digits = 5 Decimal Places = 1	
QualDataType CodeType	MonitoringQualPercentData / Yr1QualificationDataType Code MonitoringQualPercentData / Yr2QualificationDataType Code MonitoringQualPercentData / Yr3QualificationDataType Code	String	Yes	A D P	
QualLEE Applicable EmissionsType	MonitoringQualLEEData/ ApplicableEmission Standard	Decimal	Yes	Total Digits = 9 Decimal Places = 4	

(cont.)

**Figure 54
Simple Types Used for Validation (cont.)**

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
QualLEEUunitsOfMeasureCodeType	MonitoringQualLEEData/UnitsofStandard	String	Yes	LBGWH LBMMBTU LBMWH LBTBTU	
QualTestCodeType	MonitoringQualLEEData/QualificationTestType	String	Yes	INITIAL RETEST	
QualTypeCodeType	MonitoringQualificationData/QualificationTypeCode	String	No	COMPLEX GF HGAVG LEE LMEA LMES LOWSULF PK PRATA1 PRATA2 SK	
RequiredDateType	MonitoringDefaultData/BeginDate MonitoringLoadData/BeginDate MonitoringLocationAttribData/BeginDate MonitoringMethodData/BeginDate MonitoringPlanCommentData/BeginDate MonitoringQualificationData/BeginDate MonitoringQualLEEData/QualificationTestDate MonitoringSpanData/BeginDate RectangularDuctWAFData/WAFBeginDate	Date	No		Must be a date.

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
RequiredDate Type (cont.)	StackPipeData/ ActiveDate SupplementalMATSMonitoringMethodData/ BeginDate UnitCapacityData/ BeginDate UnitFuelData/ BeginDate UnitStackConfigurationData / BeginDate	Date	No		Must be a date.
RequiredHour Type	MonitoringDefaultData/ BeginHour MonitoringLoadData/ BeginHour MonitoringMethodData/ BeginHour MonitoringSpanData/ BeginHour RectangularDuctWAFData/ WAFBeginHour SupplementalMATSMonitoringMethodData/ BeginHour	Integer	No	Minimum Value (inclusive) = 0 Maximum Value (inclusive) = 23	
Required IdentifierType	ComponentData/ ComponentID MonitoringSystem ComponentData/ ComponentID MonitoringSystemData/ MonitoringSystemID	String	No	[A-Z0-9]{1,3}	One to three character alphanumeric string.
RequiredFormula IdentifierType	MonitoringFormulaData/ FormulaID	String	No	[A-Z0-9\-\]{1,3}	One to three character alphanumeric string.

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
RequiredIndicatorType		String	No	0 1	
RequiredStackPipeType	MonitoringLocationData/ StackPipeID UnitStackConfigurationData/ StackPipeID	String	No	(C c M m X x)(S s P p) [A-z0-9 \-]{1,4}	Three to six character string beginning with "CS," "CP," "MS," "MP," or "XS."
RequiredUnitType	MonitoringLocationData/ UnitID UnitStackConfigurationData/ UnitID	String	No	[A-z0-9 \-]*#}{1,6}	One to six character alphanumeric string; also allow asterisk (*), hyphen (-), and pound sign (#).
RequiredYearType	MonitoringQualLMEDData/ QualificationDataYear MonitoringQualPercentData/ QualificationYear	Integer	No	(19[0-9][0-9] 20[0-9][0-9])	Four-digit year between 1900 and 2099.
ScaleTransitionPointType	MonitoringSpanData/ ScaleTransitionPoint	Decimal	Yes	Total Digits = 6 Decimal Places = 1	
SerialNumberType	ComponentData/ SerialNumber	String	No	Maximum Length = 20 characters	
ShapeCodeType	MonitoringLocation AttribData/ ShapeCode	String	Yes	RECT ROUND	
SO2TonsType	MonitoringQualLMEDData/ SO2Tons	Decimal	Yes	Total Digits = 4 Decimal Places = 1	
SpanComponentTypeCodeType	MonitoringSpanData/ ComponentTypeCode	String	No	CO2 FLOW HCL HF HG NOX O2 SO2	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
SpanMethodCode Type	MonitoringSpanData/ SpanMethodCode	String	Yes	F FS GS HD ME OL PL TB TR	
SpanScaleCode Type	MonitoringSpanData/ SpanScaleCode	String	Yes	H L	
SpanUnitsOf MeasureCode Type	MonitoringSpanData/ SpanUnitsOfMeasureCode	String	Yes	ACFH ACFM AFPM AFSEC AMSEC INH2O KACFH KACFM KAFPM KSCFH KSCFM KSFPM MACFH MSCFH PCT PPM SCFH SCFM SFPM SMSEC UGSCM	
SpanValueType	MonitoringSpanData/ SpanValue	Decimal	Yes	Total Digits = 13 Decimal Places = 3	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
Supplemental MATSMethod CodeType	SupplementalMATSMonitoringMethodData/ SupplementalMATSMonitoringMethodCode	String	No	CEMS LEE LEST NA PMCEMS PMCPMS PMO PMQST QST	
Supplemental MATSParameter CodeType	SupplementalMATSMonitoringMethodData/ SupplementalMATSParameterCode	String	No	HG HF HCL TM TNHGM IM INHGM LU	
StackHeightType	MonitoringLocationAttribute/ StackHeight	Decimal	Yes	Total Digits = 4 Decimal Places = 0	
SubstituteData CodeType	MonitoringMethodData/ SubstituteDataCode	String	Yes	FSP75 FSP75C MHHI NLB NLBOP OZN75 REV75 SPTS	
System DesignationCode Type	MonitoringSystemData/ SystemDesignationCode	String	Yes	B CI DB P PB RB RM	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
SystemFuelCode Type	MonitoringSystemData/ FuelCode	String	Yes	BFG BUT CDG COG DGG DSL LFG LPG MIX NFS NNG OGS OIL OOL PDG PNG PRG PRP RFG SRG	
SystemFuelFlow UOMCodeType	MonitoringSystemFuel FlowData/ SystemFuelFlowUOMCode	String	No	BBLHR GALHR HSCF LBHR M3HR SCFH	
SystemTypeCode Type	MonitoringSystemData/ SystemTypeCode	String	No	CO2 FLOW GAS H2O H2OM H2OT HCL HF HG LTGS LTOL NOX NOXC NOXE NOXP	

(cont.)

Figure 54
Simple Types Used for Validation (cont.)

SimpleType Name	Used By	Base	Allow Null Values	Validation Patterns, Restrictions, and Values	Notes
SystemTypeCode Type (cont.)	MonitoringSystemData/ SystemTypeCode	String	No	O2 OILM OILV OP PM SO2 ST	
UnitControl ParameterCode Type	UnitControlData/ ParameterCode	String	No	HCL HF HG NOX PART SO2	
UnitFuelCode Type	UnitFuelData/ FuelCode	String	No	C CRF DSL LPG NNG OGS OIL OOL OSF PNG PRG PRS PTC R TDF W WL	
UpperOperation BoundaryType	MonitoringLoadData/ UpperOperationBoundary	Decimal	Yes	Total Digits = 6 Decimal Places = 0	
VersionType	MonitoringPlan/ Version	String	Yes	Maximum Length = 10 characters	
WAFMethod CodeType	RectangularDuctWAFData/ WAFMethodCode	String	Yes	AT DF FT	
WAFValueType	RectangularDuctWAFData/ WAFValue	Decimal	No	Total Digits = 6 Decimal Places = 4	