2008 National Emissions Inventory

Emissions Inventory System
Implementation Plan

Section 5
Submitting XML Data to the EIS

Revised

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August 3, 2009	• Updated the domain diagram for Facility Inventory on page 5-39 to change the relationship between Facility Site and Facility NAICS from 0..* to 1 and to change the relationship between the Facility Site and the Release Point from 0..* to 1. • Updated the domain diagram for Point Emissions on page 5-40 to change the relationship between the Reporting Period and Emissions from 0..* to 1..*.

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Section 5
Submitting XML Data to the EIS

This section provides instructions on using the Consolidated Emissions Reporting Schema (CERS) to submit data to the EIS. It is intended for information technology and inventory development staff responsible for implementing the CERS and preparing an EIS submission, and includes:

- A brief overview of XML principles as they apply to the CERS;

- An overview of the Exchange 2.0 Header structure including how the CERS payload should be implemented;

- Best practices for preparing and formatting data for the EIS; and

- An overview of the EIS domain.

This section contains a description for all complex types included in the CERS version 1.1, with an emphasis on identifying those complex types that make up the EIS submission. For category-specific reporting instructions about reporting the data, see Sections 6 through 12. Instructions of which complex types and/or data elements that should not be reported to the EIS are clearly specified in those sections. For information on the resources available from EPA to convert your data into an XML document, see Section 2, "Transitioning to the 2008 NEI."

5.1 Overall Steps to Submitting Your File

The basic steps for submitting your file to the EIS is as follows:

1. Create separate EIS CERS XML files for each data category.

2. Add the Exchange Header document to the EIS CERS XML file.

3. Attach any supporting documents or artifacts for Events or Onroad and Nonroad activity data.

4. Zip the Header document, EIS CERS XML, and supporting attachments into a single file.

5. Log into your node client or the CDX Exchange Network Web Client with your CDX credentials, and select the "submit" option.

6. Log on to your agency noe, node client or the CDX Web Client, select the EIS destination node and dataflow, and chose the single zipped file to submit.

7. Once you submit the file, the node package is sent to the EIS node.

8. EIS unzips the package and processes the contents.

> **Exchange Node 2.0**
>
> The EIS node 2.0 compliant. This section includes specifications for 2.0 exchanges. Revisions and other specification for 1.1 compatibility will be in the Flow Configuration Document (FCD).

5.2 Overview of XML and the CERS

This section provides a basic overview of XML and the CERS and includes references to complex types that should not be reported to the EIS. The CERS is used to report data to many other data flows and therefore includes additional reporting capabilities.

5.2.1 Terminology

The following terminology is used throughout this document.

Figure 5-1
Key XML Terms

Key XML Terms

Namespace: A namespace uniquely identifies a set of names such that there is no ambiguity when objects having different origins but the same names are mixed together.

Markup Language: A way to combine text and extra information to show the structure and layout of a document. This information is expressed using markup, which is typically intermingled with the primary text. A commonly known markup language is HTML.

Tuple: An ordered list of objects, each of a specific type. The CERS uses valued pairs consisting of a parameter name and a parameter value to report optional data elements to the EIS.

XML: A markup language for documents containing structured information. The XML specification defines a standard way to add markup to documents. Its primary purpose is to facilitate the sharing of structured data across different information systems, particularly via the internet.

XML Schema: An XML schema describes the structure of an XML document. An XML schema defines the set of rules to which the XML document must conform in order to be considered "valid" according to its schema. An instance of an XML schema is an XML schema document and is a file with the extension .xsd.

XML Document: An XML document is a file containing data organized into a structured document using XML markup. An XML document is considered to be "well-formed" if it conforms to all XML syntax rules. An XML document is considered to be "valid" if it conforms to all the semantic rules defined by an associated XML schema. An XML document cannot be processed if it is not well-formed or valid. XML documents have the file extension .xml.

XML Element: An XML element is a unit of the XML document that is expressed as tags in the form "<tagname>." XML elements must have either a start and end tag as in <FacilitySite> </FacilitySite> or a single empty tag name as in <FacilitySite/>. XML elements may be nested within one another in a structured hierarchy and sequence specified in an XML schema.

XML Attribute: An XML attribute contains additional information about an XML element placed at the start tag of the XML element. XML attributes have the form attributeName = "attributeValue," as in <StateCode="CA">. EIS will use XML attributes to report identifying information or to help the EIS process the data being reported within the EIS elements.

XML Simple Type: An XML element which has no attributes or nested elements.

XML Complex Type: An XML element which has attributes or nested elements. All EIS components described in other section of this document are XML complex types comprised of XML simple types and other complex types.

Figure 5-2
Key Terms Relating to EIS Data Submission

Key Terms Relating to EIS Data Submissions

CDX: The Central Data Exchange (CDX) serves as the EPA node on the Exchange Network and is the gateway for receiving environmental information through the Web.

Component: A component is a group of XML elements. This term is used in other sections of this document to be synonymous with "complex type."

Content Type: Denotes the particular form of content. For the purposes of this document, the content types referenced in the EIS schema are elements, attributes, complex types, and attachments.

Data Block: A logical grouping of data elements and other data blocks defined for the purposes of reporting data.

Data Category: The category of emissions inventory data to be reported. For the EIS, these are:
- *Facility inventory;*
- *Point emissions;*
- *Nonpoint emissions;*
- *Onroad/nonroad activity;*
- *Onroad/nonroad emissions; and*
- *Event emissions.*

Data Element: The smallest discrete unit of information that can be reported and still have meaning between systems. Examples of data elements are Agency identifiers, State codes and stack height measure. The EIS will process data elements as part of XML complex types corresponding to complex types defined as part of the reporting instructions.

Data Type: The data format defined for a given data element. Common data types include string, integer, and date. EIS requires that all data elements reported in the XML document have a data type of string. These data will be converted by the EIS to the data types defined for each data element in the reporting instructions. For example, the data element EndDate must be reported in XML as a string, but will be converted by the EIS to a date as defined in the various sections of the reporting instructions.

Exchange Network: A secure Internet- and standards-based approach for exchanging data.

Major Data Group: A logical grouping of related Data Blocks that fully describe business area, functions, and entities.

Node: A web server that facilitates the interface between database systems and the Exchange Network. It is a partners "point of presence" on the Exchange Network.

Node Client: A type of node that can submit, request, and receive data on the Network, but cannot respond to data queries from other Nodes.

Submittal Data Block: The set of data blocks that can be submitted together for a category of data. These submittal data blocks are defined for each data category and contain the minimal complex types necessary to report data such that the EIS can successfully process and integrate the data into the inventory.

Web Client: A web-based submission tool that sends data to the CDX Node over the Exchange Network. It cannot receive data on the network or respond to data queries from other nodes.

5.2.2 Purpose of the XML Schema

An XML schema is the definition that constrains the structure and content of an XML document written in XML Schema language as defined by the World Wide Web Consortium (W3C). An XML schema defines:

- The elements and attributes that are expected;
- The allowable data types for each element;
- The hierarchy and order in which elements must appear;
- Which elements are optional and which are required; and
- The maximum number of occurrences allowed for each element.

Like the architectural blueprint that describes the structural design of a house, an XML schema describes the structural design of an XML file.

Files submitted to the EIS are accepted or rejected based on their conformity to the EIS XML schema.

5.2.3 Mapping the Domain Models to XML Structures

The domain model views (see Section 5.8) show the associations between entities and therefore may resemble a relational model, similar to how a database may be represented. In comparison, the CERS structure is hierarchical, though it is possible to see a partial representation of the relational aspects of the EIS domain model in the schema complex types. The complex types themselves loosely correspond to tables; each complex type has elements that describe identity and contains data values.

Within the CERS, the hierarchical structure is a partial representation of the relational aspects of the complex types. This can be seen in the way that each complex type nests within another complex type. The nesting of that complex type in the schema demonstrates that the data in that complex type is likely to be stored in a table joined to another table in a relational database.

XML elements are individual pieces of data that correspond to columns in a table in a database. Complex types have only XML elements. These complex types contain data that is related to the owning entity by virtue of the nesting hierarchy in the XML schema.

5.2.4 General Principles Used in Developing the CERS

XML schemas can be created in many different ways, however there are principles that govern the definition and use of the CERS for reporting to the EIS. The following approach to developing and managing the XML schema has been adopted:

- Components have been logically decomposed in order to maximize their reusability among the data categories.

- XML element tag names adhere as closely as possible to EPA's XML data standards.

- XML element tag names specific to a data category reflect this where possible in order to minimize ambiguity, e.g., "FacilitySiteComment" rather than "Comment."

- No two different elements share the same tag name. XML elements are defined unambiguously. No XML element may have more than one semantic meaning for describing data within the XML schema.

- Tag names are understandable to both inventory developers and information technology staff.

- The CERS was not designed to minimize submitted file size. See Section 5.3 for best practices on the maximum size limit for file submission through a network node.

- The CERS may not be the same as the structure of the underlying EIS database.

- Given that several programs use the CERS, very few data types are enforced by the CERS. Most data elements are reported as strings but must conform to the required reporting formats defined in this document. These data types will be checked by the EIS to ensure they can be converted into the required format after the data are submitted.

- The CERS contains few restrictions on the content of the submission, and is limited primarily to indicating whether the submission is a valid and well-formed XML file. The schema contains no business rules. Business rules are applied to the content of the XML file after the data have been submitted to the EIS. This allows more flexible management of quality assurance checks and more informative feedback on check results. The submitter will receive feedback on all business checks and technical checks, including invalid reporting codes, through a feedback report sent by the EIS during the quality assurance process. For more information on the EIS QA approach see Section 1, "Introduction to the NEI and EIS," especially 1.11.11, "QA Checks."

5.3 Creating the XML Document

The following section explains how to create a CERS conformant XML document. It includes advice on best practices for reporting your data as well as how to construct your XML document.

5.3.1 Creating the XML file using Microsoft Applications

Many Microsoft applications have the capability to export data and create XML files. However, these files will not be compatible with the CERS structure. In particular, you **cannot** use MS Access to export your data and use the built-in functionality to create an XML document. You **cannot** use MS Excel to either export your data or create the XML document. These applications will create an XML document that is not in compliance with EPA's guidelines and will not validate against the CERS.xsd.

5.3.2 Size of the Submission File

The business rules for facility inventory and emissions data, and to limit the size of the file during transport, require that you limit each submission to one data category. During peak submission periods, large volume files may be processed at a lower priority in the system's queue. Limiting the content of your file to include only data that is new or should be updated will reduce the size of the file. This practice will also result in smaller feedback reports and

reliable response time during transport of files over the network node and when downloading your feedback reports.

5.3.3 Reporting Comments

If an XML tag contains the word "comment," it is an optional element in which you can provide explanations, caveats or any other information about the data in the complex type. If you provide a comment as part of a resubmission of the same complex type, the EIS will compare the comment to the previous comments. If the comment is different, it will retain the prior comment and store the incoming comment as a new comment. If you would like to edit or delete the earlier comment, you cannot use the batch submission process. You must go to the EIS Gateway and edit the comment there.

5.3.4 Codes

If the last word in an XML tag is "code," the element must contain data in a specified list of values from a code list. EPA has published the acceptable values and they can be found in the EIS Gateway. The code tables are provided in Appendix 6, "EIS Code Tables." Codes are validated by the EIS QA check process, not the schema itself. Code values have changed from those used in past inventories, and updated values may be found on the EIS Gateway. The use of invalid codes will result in data rejection.

5.3.5 How to Report Identifiers

If an XML tag contains the word "identifier," it must contain an alphanumeric identifier assigned to an element or type of data for identification purposes. An identifier uniquely identifies that data within an information system. Identifiers from different systems may have different formats, lengths, and characteristics. There are two approaches that you can take when using identifiers. You must submit the appropriate program system code with all identifiers.

5.3.5.1 EIS Identifiers

The EIS will assign unique identifiers to each facility site, emissions unit, emissions process, and release point. For the 2008 submission cycle, the facility inventory in EIS is populated with unique identifiers assigned by the EIS. These identifiers will be included in all reports available for download from the EIS Gateway. You are encouraged, but not required, to store these identifiers in your Agency systems and report these numbers in your XML document. Reporting your point emissions with these unique identifiers is the most efficient and accurate way for the EIS to process your data.

5.3.5.2 Agency Identifiers

Should you choose not to store and report EIS identifiers, you may identify your facility site, emissions unit, emissions process, and release points using identifiers from your local data system. Since these identifiers are not unique within the EIS, you will need to include additional information for the EIS to identify these entities. Include information on the data system that provided these data in the ProgramSystemCode element for each facility site. This ensures that a facility site that might be known by the same identifier in another data system can be uniquely

identified. Other important information to provide includes the StateCode, CountyCode, StateandCountryFIPSCode or TribalCode when identifying facility sites.

5.3.6 Data Types

Most data types in the CERS are strings, with the exception of date, year and percentile data. When a data element is identified as a string but appears to be storing values, you are expected to provide the correct numeric format as indicated in reporting instructions, Sections 6 through 12. The EIS will convert the string values into the formats defined and apply checks for these data types. Data which are not consistent with these formats defined in these sections will be rejected.

5.3.7 Dates and Years

All date and year tags are handled as xsd:date and xsd:gyear in the schema.

- **Date.** If a tag name contains the word "date," the data element is for a specific day. These should be represented as an eight digit sequences of numeric characters in a string format of YYYY-MM-DD and should include leading zeros between the representative elements containing only one digit. If you are submitting a date, it should be in the prescribed format, otherwise it may be left null.

- **Year.** If a tag name contains the word "year," the data element is for a calendar year. This data should be reported as a four digit sequence of numeric characters in a string format of YYYY, otherwise it may be left null.

5.3.8 Reporting Numbers

There are several different reporting formats for numbers. Although the schema accepts strings for most numeric values, the proper formats for reporting numerical values are provided in each reporting section. These formats include the data type and its attributes, such as width, scale, and precision. The EIS will convert the string into the formats defined in each section and apply checks for data type. Data which are not consistent with these formats will be rejected.

The following table describes each data type:

Figure 5-3
Reporting Formats for Numbers

Content Type	Reporting Format	Example
Integer(width)	Whole number (no decimal places, preceding zeroes not retained). *Width* = Maximum number of digits allowed.	Int (3) Valid: 2, 15, 930 Invalid: 4000, -1
Decimal(width, scale)	Decimal number with fixed number of decimal places. *Width* = Maximum number of digits including those on both sides of the decimal point, and includes the decimal point. *Scale* = Number of decimal places; that is, digits to the right of the decimal point.	Dec (5,1) Valid: 100.0, 34.6, 0.3, 0.0 Invalid: 99.75, 256.45
Float(precision)	Decimal number with floating decimal point; that is, variable number of decimal places. No width is given, as this is variable. Floating decimals may also be represented with scientific notation. *Precision* = Maximum number of significant figures (see below).	Float (3) Valid: 0.00845 *or* 8.45E-3 10.6 *or* 1.06E15 Invalid: 2,347 *or* 2.347E3 43.50 *or* 4.350E1
Percent	Decimal number of three digits with a fixed number of two decimal places.	Percent Valid: 100, 98.3 Invalid: 1 (representing 100 %), .983 (representing 98.3%)

- **Rounding.** If a value is reported with greater than the maximum stated precision, the EIS will round the submitted value and store the modified value instead. Values will not be truncated. The EIS will provide a warning message to the submitter showing the modified value. These values may be resubmitted within maximum precision to avoid EIS rounding or no action need be taken if upon review, the modified values are determine to be acceptable.

- **Percent.** If a tag contains the word "percent" or "percentage" then the data element should be reported as a percent. The number should be reported as a whole number with a decimal rather than a fraction of one, e.g., 85.5% should be reported as 85.5.

- **Precision.** Precision refers to the number of significant digits provided in a floating point decimal number, or the number of decimal places for a fixed decimal number. The EIS will not store precision beyond the maximum stated precision for the data element; it will round off excess precision. See the boxes below for more information on significant figures and rounding:

Figure 5-4
Significant Figures and Rounding

- **Significant figures.** Significant figures include all of the digits in a measurement that are known with certainty as well as the last digit, which is considered an approximation.

- The EIS will assume trailing zeros to be significant; leading zeros are not.

- Examples of numbers with three significant digits include:

0.00253	4.00
100	133E-2
99.9	670
20.3	104E5

- **Rounding**. If a value is reported with greater than the maximum stated precision, the EIS will round the submitted value and store the modified value instead. Values will not be truncated. The EIS will provide a warning message to the submitter showing the modified value. If you receive this message, you should either:

- (a) review the modified value to determine if appropriate, and/or

- (b) resubmit within maximum precision to avoid EIS rounding.

5.3.9 The CERS Namespace

The consistent use of namespaces provides a means for uniquely identifying XML constructs across the Exchange Network. Complex types and XML elements used in the EIS schema must be qualified by a Uniform Resource Identifier (URI) in order to be processed and routed properly by the CDX and the EIS. While there are two patterns for namespace identification, Uniform Resource Name (URN) and Uniform Resource Location (URL), the Exchange Network has recommended the implementation of the URL formatted namespace.

The CERS namespace uses a URL to reference the location of the current version of the CERS on the CDX network, and allows the user to reference it through a prefix "cer:." The major version number of the CERS is also included in the namespace. Without this reference, all complex types and XML elements cannot be validated resulting in an XML file validation error.

Figure 5-5 provides an XML example which declares the CERS namespace through the use of the xmlns (XML Namespace) schema attribute and assigns the namespace a prefix of "cer":

Figure 5-5
Declaring the CERS Namespace

```
<cer:CERS xsi:schemaLocation="http://www.exchangenetwork.net/schema/cer/1
CER_CERS_v1.0.xsd" xmlns:cer="http://www.exchangenetwork.net/schema/cer/1"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
```

The declaration of the namespace is included at the top of each XML file, and allows the user to reference the CERS complex types and elements with the "cer:" prefix followed by a colon (as in cer:Location). Each complex type and XML element, including root elements, must contain the namespace prefix.

5.3.10 Header Document Structure

Any submission files sent to the EIS must use the Header Document structure to meet EPA CDX processing requirements for transporting the file through the Exchange Network. The Header Document serves as a wrapper around the four different types of payloads that the EIS accepts (Facility Inventory, Emissions, Location and Events) and contains the following information, or metadata, about the submission:

- Description of payload.

- Routing information for documents transferred across the Exchange Network.

- Additional information such as the document creator and date of creation.

- Identifies operations to perform by the EIS.

The header is required to be provided for all Submit operations through the Exchange Network

The root element of the header document is the Document element, with two child elements, Header and Payload. The Payload contains the actual EIS data, adhering to the structure of the CERS. Any supporting documents (for the NMIM activity data or GIS files) are attached in the form of .zip attachments. These data attachments are referenced by name in the CERS payload section of the document, but the data attachment content exists as separate documents external to the XML document. Figure 5-6 shows the file submission structure.

Figure 5-6
Submission File Structure
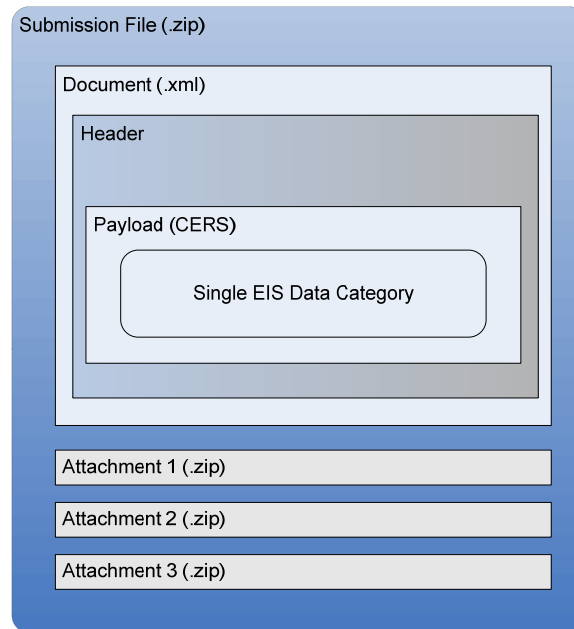
The Document elements are used by the Exchange Network to identifier the document and the default namespace for the header. The CERS payload has a separate namespace for its payload.

Figure 5-7
Exchange Header 2.0 Document Elements

Name	Description	Example	Required
ID	A unique identifier for the payload that is created during the time of submission.	ID123456789	Yes
XML Namespace	The Exchange Header 2.0 namespace. This is not the CERS namespace which is contained in the CERS document.	http://www.exchangenetwork.net/schema/header/2	Yes

The header document contains information on the individual that generated and submitted the XML file (this may not be the same person who prepared the data), the organization that prepared the data, the date and time the file was created, and any additional comments.

Figure 5-8
Exchange Header 2.0 Elements

Name	Description	Example	Required	Notes
AuthorName	Originator of the document. This should be the name of a person or a network node ID if the document is automatically generated.	John Smith	Yes	Used for reference only.
Organization Name	The organization to which the author belongs. It may be a state name, an organization name or a company name. For submissions to the CDX node, this should be the name of the organization.	State X Department of Environmental Quality	Yes	Used for reference only.
DocumentTitle	Title of the document.	Must be "EIS"	Yes	Reference to the flow.
CreationDate Time	This is a timestamp that marks when the document, including payloads and header part, was created.	2006-04-05T09:30:47-05:00	Yes	Must be in valid xsd:datetime format.
Keywords	Words that best describe the payload. Multiple keywords should be separated by commas. This is for transaction categorization and searching.		No	
Comment	Additional comments for processors.	The payload contains Point Data.	No	
DataFlowName	The name of the data flow associated with the payload. It could be the name of the data source for Query results.	EIS_v1_0	Yes	
DataService Name	Not used by EIS.		No	
SenderContact	The sender's additional contact information. It could contain sender's electronic address and/or telephone numbers where the author can be reached.	P.O. Box 1234 Richmond, VA	No	Element is not used by EIS. If data is provided it will be ignored.

(cont.)

Figure 5-8
Exchange Header 2.0 Elements (cont.)

Name	Description	Example	Required	Notes
Application UserIdentifier	The user identifier for the backend system if it is different from the NAAS user ID.		No	Element is not used in the EIS exchange. If a value is provided, it will be ignored by the EIS node and destination processor.
SenderAddress	A well-formed URI where results or reports can be sent.		No	Element is not used by the EIS.
Property	Other properties of the document using named value pairs.		Yes	See Figure 5-10.
Signature	An XML signature associated with the document.		No	Element is not used by the EIS.

Figure 5-9
Exchange Header 2.0 Payload Elements

Name	Description	Example	Required	Notes
ID	A unique identifier for the payload.		No	Element is not used by EIS.
Operation	Identification of the payload content which triggers an operation.		No	Element is not used by EIS.

Figure 5-10
Property Elements

Name	Value	Example	Required
SubmissionType	Production QA	<hdr:PropertyName>SubmissionType</hdr:PropertyName> <hdr:PropertyValue>Production</hdr:PropertyValue>	Yes
DataCategory	FacilityInventory Point Nonpoint Onroad Nonroad Event	<hdr:PropertyName>DataCategory</hdr:PropertyName> <hdr:PropertyValue>FacilityInventory</hdr:PropertyValue>	Yes
NCDDataFile	Name of NCD file	<hdr:PropertyName>NCDDataFile</hdr:PropertyName> <hdr:PropertyValue>NCDActivityData12000.zip</hdr:PropertyValue>	No

The following example demonstrates how the exchange header document is used as a wrapper to the CERS data.

Figure 5-11
Example of XML Header

```
<?xml version="1.0" encoding="UTF-8"?>
<hdr:Document id="ID02" xmlns:hdr="http://www.exchangenetwork.net/schema/header/2" xmlns:xsi="
http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.exchangenetwork.net/schema/header/2
http://www.exchangenetwork.net/schema/header/2/header_v2.0.xsd">
    <hdr:Header>
        <hdr:AuthorName>John Smith</hdr:AuthorName>
        <hdr:OrganizationName>N.C. Department of Environment and Natural Resources - </hdr:OrganizationName>
        <hdr:DocumentTitle>Air Emission Inventory System Submission 2008</hdr:DocumentTitle>
        <hdr:CreationDateTime>2009-07-05T09:30:47-05:00</hdr:CreationDateTime>
        <hdr:Property>
            <hdr:PropertyName>SubmissionType</hdr:PropertyName>
            <hdr:PropertyValue>Production</hdr:PropertyValue>
        </hdr:Property>
        <hdr:Property>
            <hdr:PropertyName>DataCategory</hdr:PropertyName>
            <hdr:PropertyValue>FacilityInventory</hdr:PropertyValue>
        </hdr:Property>
    </hdr:Header>
    <hdr:Payload>
        <cer:CERS xmlns:cer="http://www.exchangenetwork.net/schema/cer/1" xmlns:xsi="
http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.exchangenetwork.net/schema/cer/1
http://www.exchangenetwork.net/schema/cer/1/index.xsd">
            <cer:UserIdentifier>teri.archer@ncdenr.gov</cer:UserIdentifier>
```

5.3.11 Attaching Model Data and Shapefiles

In addition to the XML document, a submission can also include file attachments, such as GIS shapefiles. These are referenced in the document and should be attached to the message during submission. GIS files may be attached when reporting events geospatially, or files may be attached when reporting NMIM activity data. For information on how to extract model data from your NMIM data base or preparing GIS shapefiles for export, see Appendix 9, "Preparing NMIM County Database," and Appendix 11 "Preparing GIS Data for Export." For information on the correct naming conventions and extensions for NMIM activity data, see Section 9, "Reporting Instructions for Onroad and Nonroad Activity Data."

5.3.11.1 Identifying an Attached File through Reference in an XML Document

The following example shows how you would attach file in your XML document. Use the AttachedFile complex type to reference the file name and identify the file content.

Figure 5-12
Attaching a File through Reference

```
<cer:Event>
  <cer:EventIdentifier>5608</cer:EventIdentifier>
  <cer:ProgramSystemCode>MAIRIS</cer:ProgramSystemCode>
  <cer:EventName>Sample Event Attachment</cer:EventName>
  <cer:EventAttachedFile>
    <cer:AttachmentFileName>support_doc.txt</cer:AttachmentFileName>
    <cer:AttachmentFileDescription>Supporting Documentation</cer:AttachmentFileDescription>
    <cer:AttachmentFileSize>64</cer:AttachmentFileSize>
    <cer:AttachmentFileContentTypeCode>DOC</cer:AttachmentFileContentTypeCode>
  </cer:EventAttachedFile>
</cer:Event>
```

5. 4 Schema Validation

The following section describes the various tools that are available and validation rules you should implement prior to submitting your XML document to the EIS. This includes information on how to validate your XML document, the few built-in constraints that the schema will enforce, and the cardinality rules that you should avoid when constructing your data.

5.4.1 Validating Your File Prior to Submission

Before testing your data in the QA environment or submitting your file to the Production environment, you should validate your XML file against the CERS_CERS_v1.1.xsd file structure. This will ensure that your file is well-formed and valid. You can do this by using one of several tools found at EPA's Exchange Document Validation Services Site.

The CERS contains few validation business rules regarding the content of the submission; however, some data types are constrained. You will receive all business logic checks, including invalid reporting codes used through a feedback report sent from the EIS during the quality assurance checking process. For more information on the QA approach with the EIS, see Section 1, "Introduction to the NEI and EIS," especially Section 1.11.11. There are very few basic validation checks that are constructed in the schema. The following table identifies these checks.

Figure 5-13
Schema Validation Checks

Name	Check	Explanation
UserIdentifier	Required Element	Must be a valid registered user of the EIS to submit files. This account may be mapped to an existing EPA account for authentication.
EmissionsYear	Required Element	The EIS only accepts emissions and inventory data for Inventory Years for open submission periods.
ProgramSystemCode	Required Element	Information management system acronym must be provided for source of data.
Date DataType	Format	All dates must be in xsd:date format (YYYY-MM-DD).
Percent DataType	Format	All percents must be reported as decimal as fractionDigits="1" minInclusive="0.0" maxInclusive="100.0"
Year DataType	Format	All years must be reported in xsd:gYear format (YYYY).

5.4.2 Cardinality Rules

While your XML file may pass well-formed schema checks and file validation checks, it may still encounter cardinality errors. In most cases, the following cardinality errors are assumed to be code generation errors and therefore the file submission may be rejected. The EIS will apply the following rules while processing the data contained within the XML document.

Rule 1: No Duplication of XML Elements within a Complex Type

You may not report the same XML element twice within a complex type. This will result in ambiguous identification of information and the data within the complex type or block will be rejected. The example below demonstrates a facility site complex type with two FacilitySiteNames reported when only one is expected. This is assumed to be a systemic error in the system that generated the XML document. This file will be rejected in its entirety.

Figure 5-14
Duplicate XML Elements in a Complex Type

```
<cer:FacilitySite>
  <cer:FacilitySiteName>Ivy Sanitary Landfill</cer:FacilitySiteName>
  <cer:FacilitySiteName>Ivory Sanitation Landfill</cer:FacilitySiteName>
```

Rule 2: No Duplication of Complex Data Types

You may not report the same complex type containing duplicate identifiers with inconsistent information twice. This will result in contradictory information and the data in the complex type will be rejected. The example below demonstrates two complex types reported

with the same emissions release point identifier within the document, each with different stack parameters. This is assumed to be a systemic error in the system that generated the XML document. This file will be rejected in its entirety.

Figure 5-15
Duplication of a Complex Data Type

```
<cer:ReleasePoint>
   <cer:ReleasePointTypeCode>2</cer:ReleasePointTypeCode>
   <cer:ReleasePointDescription>natural gas fired boiler exhaust</cer:ReleasePointDescription>
   <cer:ReleasePointStackHeightMeasure>32</cer:ReleasePointStackHeightMeasure>
   <cer:ReleasePointStackDiameterMeasure>2.4</cer:ReleasePointStackDiameterMeasure>
   <cer:ReleasePointExitGasVelocityMeasure>31.2</cer:ReleasePointExitGasVelocityMeasure>
   <cer:ReleasePointExitGasVelocityUnitofMeasureCode>FPS</cer:ReleasePointExitGasVelocityUnitofMeasureCode>
   <cer:ReleasePointExitGasFlowRateMeasure>141.07</cer:ReleasePointExitGasFlowRateMeasure>
   <cer:ReleasePointExitGasFlowRateUnitofMeasureCode>ACFS</cer:ReleasePointExitGasFlowRateUnitofMeasureCode>
   <cer:ReleasePointExitGasTemperatureMeasure>134</cer:ReleasePointExitGasTemperatureMeasure>
   <cer:ReleasePointStatusCode>OP</cer:ReleasePointStatusCode>
   <cer:ReleasePointStatusCodeYear>2005</cer:ReleasePointStatusCodeYear>
   <cer:ReleasePointIdentification>
      <cer:Identifier>900007</cer:Identifier>
      <cer:ProgramSystemCode>NCDAQ</cer:ProgramSystemCode>
   </cer:ReleasePointIdentification>
</cer:ReleasePoint>
<cer:ReleasePoint>
   <cer:ReleasePointTypeCode>2</cer:ReleasePointTypeCode>
   <cer:ReleasePointDescription>natural gas fired boiler exhaust</cer:ReleasePointDescription>
   <cer:ReleasePointStackHeightMeasure>32</cer:ReleasePointStackHeightMeasure>
   <cer:ReleasePointStackDiameterMeasure>2.4</cer:ReleasePointStackDiameterMeasure>
   <cer:ReleasePointExitGasVelocityMeasure>31.2</cer:ReleasePointExitGasVelocityMeasure>
   <cer:ReleasePointExitGasVelocityUnitofMeasureCode>FPS</cer:ReleasePointExitGasVelocityUnitofMeasureCode>
   <cer:ReleasePointExitGasFlowRateMeasure>141.07</cer:ReleasePointExitGasFlowRateMeasure>
   <cer:ReleasePointExitGasFlowRateUnitofMeasureCode>ACFS</cer:ReleasePointExitGasFlowRateUnitofMeasureCode>
   <cer:ReleasePointExitGasTemperatureMeasure>134</cer:ReleasePointExitGasTemperatureMeasure>
   <cer:ReleasePointStatusCode>OP</cer:ReleasePointStatusCode>
   <cer:ReleasePointStatusCodeYear>2005</cer:ReleasePointStatusCodeYear>
   <cer:ReleasePointIdentification>
      <cer:Identifier>900007</cer:Identifier>
      <cer:ProgramSystemCode>NCDAQ</cer:ProgramSystemCode>
   </cer:ReleasePointIdentification>
</cer:ReleasePoint>
```

Rule 3: No Duplication of Major Data Blocks

You should not report two sets of information regarding the same facility site, location or event within the same submission file. If more than one data block is found for the same location within a submission file for a specific process, the system will overwrite the previous transaction recorded for that location. The example below demonstrates how the submission for the first location recorded a transaction for a process identified as "1A." This was followed by a second submission for the same location, but with a process identified as "1B." EIS will overwrite the information previously submitted for process "1A"with the new submission for process "1B".

Figure 5-16
Duplication of a Location Complex Type

```
<cer:Location>
  <cer:StateAndCountyFIPSCode>53067</cer:StateAndCountyFIPSCode>
  <cer:LocationEmissionsProcess>
    <cer:SourceClassificationCode>2420000055</cer:SourceClassificationCode>
    <cer:ProcessIdentification>
      <cer:Identifier>1A</cer:Identifier>
      <cer:ProgramSystemCode>WS</cer:ProgramSystemCode>
    </cer:ProcessIdentification>
    ...........
</cer:Location>
<cer:Location>
  <cer:StateAndCountyFIPSCode>53067</cer:StateAndCountyFIPSCode>
  <cer:LocationEmissionsProcess>
    <cer:SourceClassificationCode>2420000055</cer:SourceClassificationCode>
    <cer:ProcessIdentification>
      <cer:Identifier>1B</cer:Identifier>
      <cer:ProgramSystemCode>WS</cer:ProgramSystemCode>
    </cer:ProcessIdentification>
    .......
</cer:Location>
```

5.5 File Submission

The following section describes the various steps involved in completing an EIS submission.

5.5.1 Acquiring a CDX Account

In order to submit your XML document to the EIS the submitter is required to have a CDX account. The following steps outline the general process for how users acquire CDX accounts and access to the EIS community.

- User goes to a registration area of the EPA Portal, registers as a new user, and asks for access to the EIS Community.

- The EIS account manager is notified of the request and can approve or deny the account, and community access. This process results in a Web Access Management (WAM) identity, and authorization to access the EIS Community. The authorization will include the authorization to access the EIS Gateway and to submit files.

- The user is notified of successful registration, after which they can then access the EIS and submit files.

5.5.2 The Exchange Network EIS Submission File

To submit the XML document through the Exchange Network to EIS, S/L/Ts will use node-to-node transfers or may submit using the CDX Exchange Network Web Client. The EIS will support the transfer of files using only the 2.0 version of the Exchange Header. Further

information will be provided on how to use the Header on the Exchange Network and the services support in the EIS Flow Configuration Document. The submission file must include the Header, and only one CERS payload, and one or more supporting zip files. The entire submission file must be zipped.

5.5.3 Submitting Your File

All file submissions are required for the user to have an authorized EIS and CDX account and access to the EIS dataflow. All files must utilize EPA's exchange network to transport their files. EPA's network of nodes makes it possible for State, Local, and Tribal Agency users to exchange data with other exchanges, providing they have nodes. However, not all S/L/Ts have nodes. There are several options for how to transport the XML file through the network.

CDX Network Node: A server that facilitates the interface between database systems and the Exchange Network. It is a partners "point of presence" on the Exchange Network. Nodes that supports:

- Server accessibility on the Web;

- Complies with the protocols to ensure secure exchanges;

- Sends and receives standards-based messages;

- Returns requested information as XML; and

- Each partner has only one Node.

Exchange Network Web Client: EPA's site for submitting environmental information via standard web browsers. The web client supports:

- Users to submit data via web-based forms and file uploads;

- Users to receive submission confirmation and processing reports;

- Supports XML for the payload (must be zipped);

- Supports Simple Object Access Protocol (SOAP) as a wrapper for the payload;

- Web Services Description Language (WSDL) for network exchange functions and services; and

- Hypertext Transfer Protocol (HTTP) for secure communication via the Internet.

Once files are pushed into the data flow, CDX will submit the XML document to the EIS back-end node and discards the submission payload; the XML file is archived for one year. Once the EIS back-end node accepts the XML file it generates submittal identification information and begins processing the data content within the payload.

5.5.4 Quality Assurance and Receiving Feedback

All EIS messages are submitted through EPA's CDX environment. To check that the data in your XML document have been prepared and formatted properly for submission to the EIS, you may use the Quality Assurance Environment. You are encouraged to use this

environment as frequently as necessary to help ensure that the submission is of the highest quality. You will receive a feedback report, which indicates critical errors and potential issues, upon submitting your XML document to either the QA environment or the Production environment and after the EIS has completed checking. You are expected to correct the problems with your data content or the XML document structure and resubmit the file to ensure the entire content of the document is checked. After the EIS processes the payload content, the resulting data can be viewed on the EIS Gateway generally within one to two business days. The results from onroad and nonroad activity data generally take longer to process; allow as much as one month before expecting to access the data online. In all cases, you will receive notification when the processing of your data is complete.

For more information, see Section 1, "Introduction to the NEI and EIS," especially 1.11.11.

5.6 Overview of Major Data Groups and Data Blocks

For the 2008 inventory, the CERS accommodates the reporting of the facility inventory and emissions from point, nonpoint, onroad/nonroad, and events sources. The following section contains information on the major groupings of data in the schema. In addition to providing a high-level model, this section describes the basic XML blocks that are used for reporting the various categories of data in the EIS as well as those blocks or elements that *should not* be reported as they are used for other data flows. For more information on the EIS Domain, see Section 5.8.

Supporting implementation documents can be found on the Exchange Network XML Registry. In addition to the CERS, the flow configuration document (FCD), data exchange template (DET) and sample XML documents are available for download.

5.6.1 Background and Definitions

Using EPA's Core Reference Model (CRM) version 2.0 as guidance, the CERS incorporates the four Major Data Groups for reporting data. The CRM is a high-level depiction of major groupings of environmental data and their relationships. It was created to provide federal, state, and tribal environmental agencies with guidance for consistently building and sharing environmental data on the Exchange Network. The CERS logical groupings consist of a series of Data Blocks and describe a business area or reporting functionality. These Major Data Groups include smaller Data Blocks which themselves may consist of other Data Blocks and simple data elements. Figure 5-17 demonstrates how Major Data Groups consist of several Data Blocks and these Data block consists of groups of related data elements.

Figure 5-17
Legend to Block Diagrams
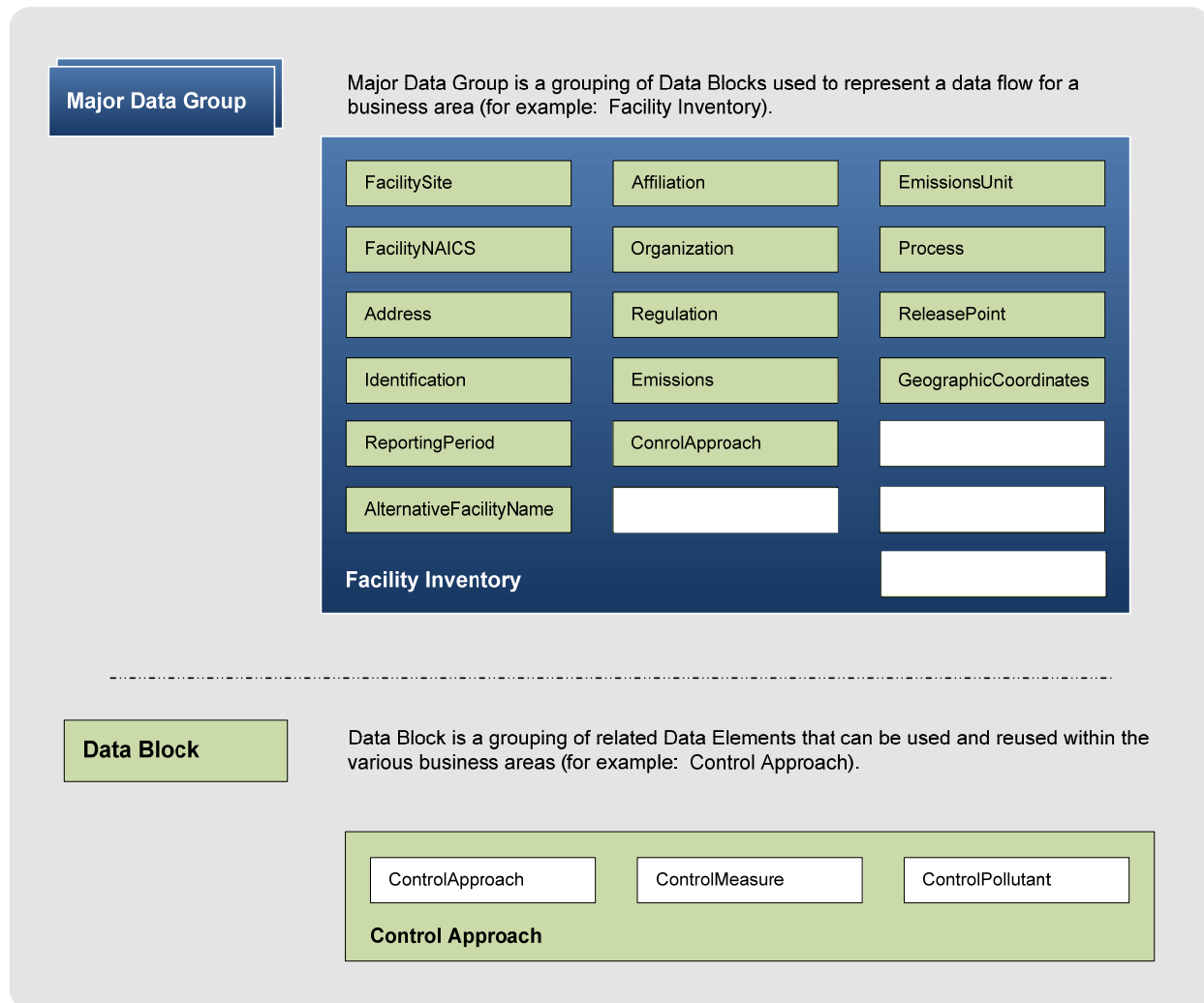
5.6.2 The CERS Conceptual Components

The CERS supports many different data flows and therefore is comprised of a series of Data Blocks which may be used for one program and not for others. There are four Major Data Groups defined for reporting inventory and emissions to the EIS. Three of these groups are facility-based reporting, location-based reporting, and event-based reporting. The fourth Major Data Group is the common set of Data Blocks that comprise the reporting of Emissions for any of the first three Major Data Groups.

- **Facility Inventory -** Facility reporting assumes that emissions of any type (criteria air pollutants, hazardous air pollutants, and GHGs) would be associated with and reported for units and activities at a discrete site. Most data flows include facility reporting, as this is the most frequently used reporting method.

For the reporting of facility information, the CERS supports facility information and identifiers, corporate ownership, responsible persons, geographic information, and information about units, release points, air pollution controls, and applicable regulations. Facilities have either processes or activities that produce air pollution. These are linked directly to the emissions values and supporting information for a specified time period.

- **Location** - Location reporting allows a reporter to aggregate and report emissions for a specific type of activity or process for a given geographic area.

  The CERS supports geographic boundary identification (including country, State, Tribal, county, census block, and tract or geospatial area), as well as areas that are excluded from that location. Emissions occur during a specific time period from activities that occur at that location. Control reduction approaches may be reported for these processes and operating details indicate the seasonal variations. Supplemental parameters allow the reporting of additional input data used to calculate emissions.

  Location reporting is the primary method by which State, Local, and Tribal agencies will report "nonpoint" and mobile emissions for the NEI.

- **Event** - An event may occur over multiple days and may spread to adjoining geographic locations. Event reporting allows the reporting of emissions that are caused by sporadic or unplanned activities, such as a forest fire or agricultural and prescribed burns. An event is defined by its geographic or spatial characteristics and the timeframe in which it occurs.

  The CERS provides for the reporting of either geographic coordinates or geospatial information. An event may be comprised of several smaller events which may merge into one larger complex event. This often is the case when multiple discrete fires become a larger fire.

  Event reporting will be used by State, Local, and Tribal agencies to report events to the NEI.

- **Emissions** - For facility-based, location-based or event-based sources, emissions may be reported for a variety of reporting time periods. The reporting of estimation or calculation methodology is supported along with the ability to identify additional supplemental data used to do the calculation and CO_2 equivalents.

5.6.3 CERS Data Blocks

Data Blocks are small, discrete sets of data elements that are grouped together in the schema. These Data Blocks represent XML complex types and are often shared in Major Data Groups. Data Blocks are frequently reused at various hierarchical levels within the schema.

Figure 5-18 lists all Data Blocks within the CERS and which Major Data Group uses the block. Data Blocks that are in the CERS but ***should not*** be reported to the EIS are identified in this figure as well.

Figure 5-18
CERS Data Blocks

Data Block Name	Description	Facility Inventory	Location	Event	Emissions	Not Used by EIS
		Major Data Groupings				
Address	The location where a facility site or organization is located or an individual may be reached.	X				
Affiliation	Identifies the relationship between the facility site, a quality finding, or an individual and an organization.	X				
AlternativeFacilityName	Identifies any alternative names by which the facility site is known or has been known.	X				
AttachedFile	References a file attached to the schema.		X	X		
CO_2Equivalent	Each pollutant can have a CO_2 equivalent.					X
Communication	The means by which an individual or organization can be sent messages.					X
ControlApproach	Identifies the overall control system or approach, including capture effectiveness, where applied at an emissions unit activity or process to reduce the amount of pollutants released into the environment.	X	X			
ControlMeasure	Identifies the specific control devices or practices that are applied to an emission stream after capture and routing.	X	X			
ControlPollutant	Identifies the pollutants reduced by the control measures and their reduction amounts.	X	X			
EmissionsUnit	Identifies an activity, stationary article, process equipment, machine, or other device from which air pollutants emanate or are emitted either directly or indirectly into the environment at the facility site.	X				
Emissions	Identifies all pollutants being reported for the process and reporting period.		X	X	X	
Event	Identifies the event, reporting land manager, management methods, and data sources.			X		
EventEmissionsProcess	Describes the fuels, fuel conditions, combustion characteristics, and activity that produce emissions.			X		

(cont.)

Figure 5-18
CERS Data Blocks (cont.)

Data Block Name	Description	Facility Inventory	Location	Event	Emissions	Not Used by EIS
EventLocation	Identifies the location where the event occurred.			X		
EventReportingPeriod	The time period for which emissions are reported.			X		
ExcludedLocation Parameter	Identifies the excluded locations from the primary reporting location by identifying one or more tribal codes, census block identifiers, census track identifiers, or shape identifiers as parameters.		X			
FacilityIdentification	Identifies any identifiers by which the facility site is known.	X				
FacilityNAICS	North American Industry Classification System code assigned to facility site based on economic profile.	X				
FacilitySite	Information on the facility site, including the facility category code, company name, NAICS code, and operating status.	X				
GeographicCoordinates	Identifies the geographic location of the facility site, emission release point, or event.	X		X		
GeospatialParameters	Describes geospatial location of event using shapefile information.			X		
Identification	A designator used to uniquely identify a business establishment.	X				
Individual	Information representing the person who is associated with an organization or a facility site.					X
Location	Information on the location of an emissions source.		X			
MergedEvents	Identifies discrete fires that merged into the current complex fire event.			X		
OperatingDetails	Identifies the typical operating schedule for the process during the reporting period.		X		X	
Organization	The organization which directs, is responsible for, or has authority over the activities and operations of the facility site.	X				

(cont.)

Figure 5-18
CERS Data Blocks (cont.)

Data Block Name	Description	Facility Inventory	Location	Event	Emissions	Not Used by EIS
Process	Identifies the specific operational activities that produce emissions either directly or indirectly.	X	X			
QualityFinding	The quality findings applicable to a facility site, emissions unit activity, or a reporting period for which emissions have been reported.					X
Regulation	Identifies regulatory programs that are applicable to an emissions unit activity or process.	X	X			
ReleasePoint	Identifies the point at which emissions are released into the environment, via a stack or fugitive release.	X				
ReleasePoint Apportionment	The percent of emissions for an emissions process that are vented through the emission release point.	X				
ReleasePointTest	Results of tests performed at the release point.					X
ReportingPeriod	Identifies the reporting period for which emissions and related activity data are submitted.		X	X	X	
Root	Identification information regarding the submission file.	X	X	X	X	
Supplemental CalculationParameter	Identifies additional emissions calculation input parameters beyond the general parameters that are used for calculating emissions.		X		X	

5.6.4 CERS Complex Types

Data Blocks are directly associated with XML complex types that are defined in the CERS.xsd. EPA standards specify that all complex types must be named uniquely in an XML schema. When a complex type is unique, it inherits the same name as the Data Block. However, when a complex type is reused, these complex types are named using the parent Data Block as the prefix, concatenated with the name of the reused Data Block. For example, the reused Data Block "Address" when used in the "Organization" Data Block requires the complex type to be named "OrganizationAddress."

Figure 5-19 shows the names of the complex type in the CERS that share common Data Blocks.

Figure 5-19
Reused Data Blocks and CERS Complex Types

Data Block	CERS Complex Type	Not Used by EIS
Address	FacilitySiteAddress	
	IndividualAddress	X
	OrganizationAddress	X
Affiliation	FacilitySiteAffiliation	
AttachedFile	EventAttachedFile	
	FacilitySiteAttachedFile	X
	OrganizationAttachedFile	X
	QualityFindingAttachedFile	X
Communication	IndividualCommunication	X
	OrganizationCommunication	X
ControlApproach	ProcessControlApproach	
	UnitControlApproach	
Emissions	EventEmissionsProcessEmissions	
	ReportingPeriodEmissions	
Identification	IndividualIdentification	X
	OrganizationIdentification	X
	ProcessIdentification	
	ReportingPeriodQualityIdentification	X
	ReleasePointIdentification	
	ReleasePointApportionmentIdentification	
	UnitIdentification	
Individual	AffiliationIndividual	X
	OrganizationIndividual	X
Organization	AffiliationOrganization	
	QualityFindingOrganization	X
Process	LocationEmissionsProcess	
	UnitEmissionsProcess	

(cont.)

Figure 5-19
Reused Data Blocks and CERS Complex Types (cont.)

Data Block	CERS Complex Type	Not Used by EIS
QualityIdentification	FacilitySiteQualityIdentification	X
	UnitQualityIdentification	X
Regulation	ProcessRegulation	
	UnitRegulation	
GeographicCoordinates	EventGeographicCoordinates	
	FacilitySiteGeographicCoordinates	
	ReleasePointGeographicCoordinates	

5.6.5 Rules for Using Schema Complex Types

- **Optional complex types.** The CERS does not contain business rules or have the capability to handle conditional logic on the content of the data. It is capable of supporting the reporting and transport of data for all data categories and multiple data flows. Under the schema rules, all complex types are considered optional; however, EIS business rules specify which complex types are required for each data category, and an omission may result in all or part of the data in the file being rejected during file checking. Further detail on what complex types and data elements are required can be found in the reporting instructions in Sections 6 through 12.

- **Accuracy of tag names.** The CERS must recognize each tag name in a submitted file. An unrecognized tag will cause the file to fail an XML validation against the CERS. The EIS will not accept an XML document that is not well-formed. Validate your XML file against the CERS.xsd to ensure that all tag names are recognized prior to submission. You may do this by using one of the schema validation tools found at EPA's Exchange Document Validation Services site on the Exchange Network.

- **Required XML element tags vs. required data.** If a complex type contains a required tag, that tag must be reported. If the value submitted for a required tag is a null or empty value, the contents will fail the quality assurance check and may be rejected.

- **Optional XML elements.** If an XML element is identified as optional, it is not necessary for that element to be present for the XML to be valid. Optional XML elements which are present with an empty tag or a null value will not cause any quality assurance failures during processing.

5.6.6 Data Blocks used to Report to EIS

The following section provides a closer look at the Data Blocks that comprise each of the Major Data Groupings. The EIS adopts the concept of the Data Block from the Exchange Network Core Reference Model Version 2.0.

The following diagram demonstrates the top-down, or "coarse-to-fine" view of a Major Data Grouping. At the top of the diagram, the coarsest view is the Facility Inventory Major Data Grouping. It contains numerous Data Blocks, however, no representation of the nesting structure or dependency is represented. At the finest level, at the bottom of the diagram, is the data element. This section of the documentation focuses on the coarser views. Detailed information on each data element can be found in NEIP section 1.12, "What are the Processes for Specific Categories?" as well as Sections 6 through 12.

5.6.6.1 Facility Inventory

The Facility Inventory Major Data Grouping contains Data Blocks and Data Elements that uniquely identify a facility site. The Facility Site complex type is the parent complex type within which all dependent nested facility inventory complex types are reported.

When you submit emissions for a facility site, you must identify the site by unique identifiers and include all the necessary dependent complex types for that data category.

Figure 5-21 shows the Data Blocks used for reporting Facility Inventory. Figure 5-20 provides a key for figures 5-21 through 5-24.
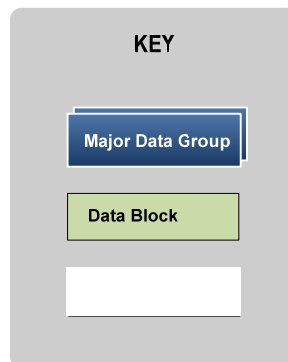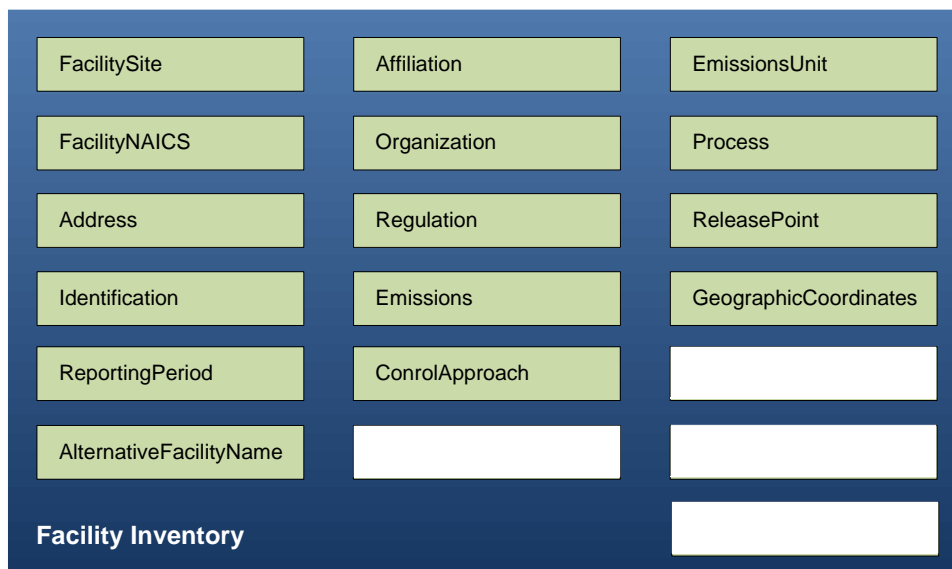
Figure 5-20
CERS Diagram Key

Figure 5-21
Facility Inventory Major Data Grouping

FacilitySite	Affiliation	EmissionsUnit
FacilityNAICS	Organization	Process
Address	Regulation	ReleasePoint
Identification	Emissions	GeographicCoordinates
ReportingPeriod	ConrolApproach	
AlternativeFacilityName		

Facility Inventory

5.6.6.2 Location Major Data Grouping

The Location complex type is the set of Data Blocks and data elements that must be reported to uniquely identify a geographic area. The Location complex type is the parent structure within which all dependent nested complex types are reported.

> Each location complex type can contain only one geographic location.

When you submit emissions for a geographic area, you must define the location by identifying the appropriate data elements within the Location complex type, and include all the necessary dependent complex types for that data category. You may submit multiple location complex types in any order. You must use the XML elements appropriate to the data category (nonpoint, onroad/nonroad, and event).

Figure 5-22 shows the Data Blocks within the Location Major Data Grouping for reporting nonpoint, onroad and nonroad emissions.

Figure 5-22
Location Major Data Grouping
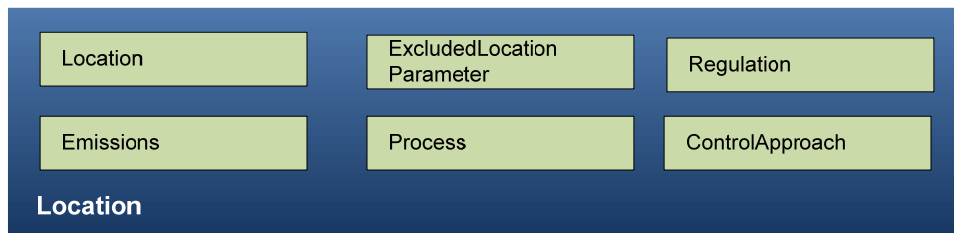
5.6.6.3 Emissions Major Data Grouping

Figure 5-23 shows the primary complex types to report emissions data. This data grouping cannot be reported independent of one of the three Major Data Groupings, however, only the complex types that contain identification information are required. Not all Data Blocks are required to be reported and is dependent on the requirements for each category of data. For example, to report onroad/nonroad emissions, only two of the six Data Blocks (Reporting Period and Emissions) are accepted.

Figure 5-23
Emissions Major Data Grouping
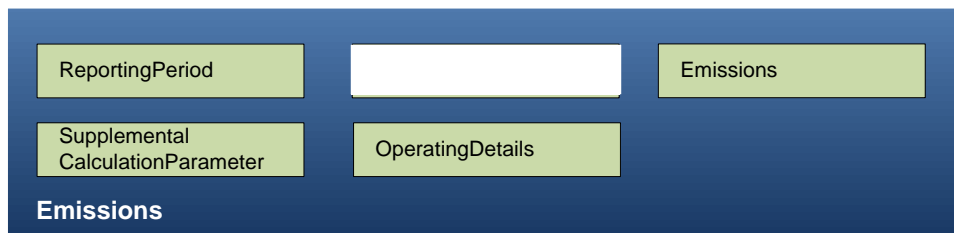
5.6.6.4 Event Major Data Grouping

Emissions reported for events are based on periodic episodes in which emissions occur and can shift or spread across many geographic areas over time. The Event Major Data Grouping allows the reporting of emissions that occur for a specific time duration for an event and the total area affected during that time.

Figure 5-24 shows the Data Blocks that are used in the Events Major Data Grouping.

Figure 5-24
Event Major Data Grouping

5.6.7 Submittal Data Blocks (SDBs)

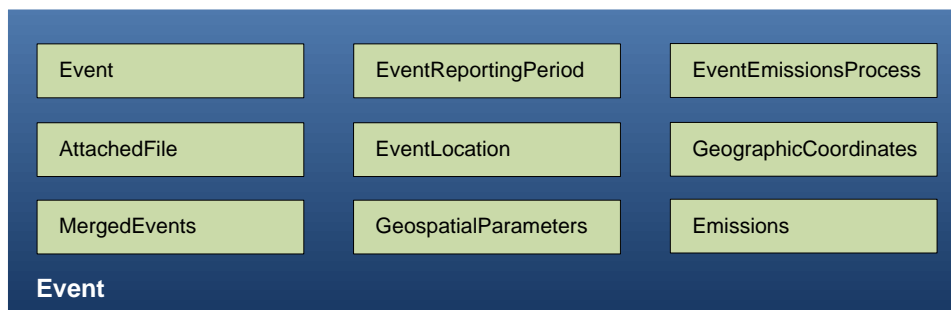A submittal data block (SDB) is a grouping of related Data Blocks that must be submitted and integrated into the inventory together, to ensure the information contained in these blocks can be processed comprehensively and consistently within the inventory. If one or more of the required information for these SDBs are missing, the data cannot be processed correctly and will be rejected by the EIS. The EIS defines a series of SDBs which are comprised of these data blocks and contain the minimal data necessary to report data for each category to the EIS.

The following table defines the SDBs that must always be reported together or the data will be rejected. To identify a SDB for a data category, first determine your intent for reporting data. A submitter will have three reporting intents; maintaining facility inventory, reporting emissions, or reporting events.

Those complex types marked with an "R" indicate complex types that are required to be reported in your XML document. Complex types that must be reported based on certain business rules are marked with a "BR." An example, the unit control approach complex type must be reported if the emissions unit is controlled. See the reporting section for each data category to learn more about these business rules. Complex types marked with an "O" indicates reporting the complex type is always optional.

Figure 5-25
Submittal Data Blocks and the Constituent Complex Types

Purpose	Major Data Grouping	Description	Complex Types	Facility Inventory	Point	Nonpoint	Onroad/ Nonroad	Event
Manage Facility Inventory	Facility Inventory	Complex types needed to report a new or modify an existing facility site.	FacilitySite	R				
			FacilityNAICS	R				
			FacilityIdentification	R				
			AlternativeFacility Name	O				
			FacilitySiteAffiliation	O				
			Organization	O				
			FacilitySiteAddress	R				
			FacilitySite Geographic Coordinates	R				
			EmissionsUnit	R				
			UnitIdentification	R				
			UnitRegulation	O				
			UnitControlApproach	O				
			UnitControlMeasure	BR				
			UnitControlPollutant	BR				
			UnitEmissionsProcess	R				
			ProcessIdentification	R				
			ReleasePoint	R				
			ReleasePoint Identification	R				
			ReleasePoint Geographic Coordinates	O				
			ReleasePoint Apportionment	O				
			ProcessControl Approach	O				
			ProcessControl Measure	BR				

(cont.)

Figure 5-25
Submittal Data Blocks and the Constituent Complex Types (cont.)

Purpose	Major Data Grouping	Description	Complex Types	Facility Inventory	Point	Nonpoint	Onroad/ Nonroad	Event
Manage Facility Inventory (cont.)	Facility Inventory	Complex types needed to report a new or modify an existing facility site.	ProcessControl Pollutant	BR				
Report Emissions (Point Source)	Facility Inventory	Uniquely identifies the location of an existing facility site. Supports the identification of emissions processes and the reporting of emissions.	Facility Site		R			
			FacilityIdentification		R			
			EmissionsUnit		R			
			UnitIdentification		R			
			UnitEmissionsProcess		R			
			ProcessIdentification		R			
	Emissions		ReportingPeriod		R			
			OperatingDetails		O			
			Supplemental CalculationParameter		O			
			ReportingPeriod Emissions		R			
Report Emissions (Location Based)	Location	Uniquely identifies the location of an area source. Supports the identification of emissions processes and the reporting of emissions.	Location			R	R	
			ExcludedLocation Parameter			O	O	
			LocationEmissions Process			R	R	
			ProcessControl Approach			BR		
			ProcessRegulation			O		
	Emissions		ReportingPeriod			R	R	
			OperatingDetails			O		
			Supplemental CalculationParameter			O		
			ReportingPeriod Emissions			R	R	

(cont.)

Figure 5-25
Submittal Data Blocks and the Constituent Complex Types (cont.)

Purpose	Major Data Grouping	Description	Complex Types	Facility Inventory	Point	Nonpoint	Onroad/ Nonroad	Event
Report Events	Event	Identify and report emissions for events that occur during time intervals at various locations.	Event					R
			MergedEvent					O
			EventReportingPeriod					R
			EventLocation					R
			GeospatialParameters					BR
			Geographic Coordinates					BR
			EventEmissions Process					R
			Emissions					R

  * R=Required; BR=Conditionally Required based on Business Rules; O= Optional
 ** Submitters only need to report the identifiers for an existing facility site in order to report new emissions units, emissions
        processes, control approaches, or release points.

5.7 Overview of the Complex Types and Root Data Elements

For every complex type in the CERS described in Sections 6 through 12 of this document, a brief description is provided, indicating how it is used for reporting data. Special tips or instructions for reporting certain data elements are provided. The notes contain information that is useful for the developer in understanding how the data are processed by the EIS. Instructions on the quality assurance checks that will be performed on each data element are also included.

To review the entire content of the CERS you may download the CERS xsd from Exchange Network XML Registry. Documentation on the CERS can be found in the Appendix 2, "CERS and Examples." The following section describes the Root complex type, and all its data elements.

5.7.1 Identifying Complex Types and Data Elements for Submitting Data to the EIS

In the following section on the CERS Root elements, and in Sections 6 through 12, each complex type is described in a figure. These figures show all of the complex types and data elements in the CERS. Some complex types are not reported to the EIS (but are used for other data flows). In this case, the complex type is noted, but the elements that should not be reported to the EIS are depicted with different font and background. For each complex type, a figure is shown with three columns. The first column in the figure identifies the data type. The second

column contains the name of the XML tag. The third column provides processing or development notes that assist the schema developer in constructing their XML document. Figure 5-26 provides a key for how EIS and non-EIS data elements and complex types are shown in all the figures.

Figure 5-26
Example of Elements and Complex Types that Should Not Be Reported to EIS

Data Type	Name	Notes
xsd:string	Data Element	This data element should be reported to the EIS.
complex	Data Element or Complex Type	This data element or complex type should not be reported to the EIS.

5.7.2 CERS Root Elements

The elements under the CERS root must be included in every submission. These XML elements identify the person who prepared the data and the emissions year. If each data category has a different contact person, consider submitting separate submission files for each contact person responsible for the preparation of the data.

How these data elements are processed: Submissions that are missing UserIdentifier and ProgramSystemCode or have a UserIdentifier or a ProgramSystemCode that is not recognized or is invalid will be rejected. EmissionsYear must be reported. Emissions years that are not valid for the open submission window will be rejected. Model, ModelVersion are only used when reporting Event and onroad/nonroad data.

Data that have been converted by EPA's XML File Generator tool that is using an invalid model version, or onroad/nonroad data that have been prepared with a model no longer supported by EPA, will cause the submission file to be rejected by the EIS.

> **Important Note**
>
> You may only report emissions for the year of the current inventory cycle. Emissions for a year in which has passed or for future years will be rejected. For example, emissions for 2005 may not be reported during the 2008 inventory cycle.

Figure 5-27
CERS Root Elements

Data Type	Name	Notes
xsd:string	UserIdentifier	Unique identifier of a user record. This identifier is assigned by the receiving system and is unique for each user. Permissions for updating data are granted based on the user identification.
xsd:string	ProgramSystemCode	The code that represents the information management system which has responsibility for the data in a linked or interrelated information management system.
xsd:gYear	EmissionsYear	The year of the submitted emissions.
xsd:string	Model	The name of the model or the conversion tool used for generating the emissions data.
xsd:string	ModelVersion	The version of the model or conversion tool.
xsd:date	EmissionsCreationDate	Date that the data being submitted were created, or the date when the model generating the data was run.
xsd:string	SubmittalComment	Any comments regarding the file submission.
complex	FacilitySite	Information on the facility site.
complex	Location	Information on the location of an emissions source.
complex	Event	Information about the event identification, fire name, reporting land manager, the classification of the fire, and the duration of the overall event.
complex	QualityFinding	The quality or verification findings for a facility site, emissions unit activity, or a reporting period for which emissions have been reported.

5.8 EIS Domain Model

This section presents the EIS domain model by using a set of domain view diagrams, one for each data category. These diagrams show the relationships among the EIS entities and how they map to the schema's hierarchical structure. The diagrams should not be interpreted as a guide for database development. They are intended to assist you in mapping your current data to the EIS domain for the purposes of creating XML documents. The complex types and elements that will be used to report EIS data are explained in Sections 6 through 12.

5.8.1 How to Read the EIS Domain Model Diagrams

Figures 5-29 through 5-33 are diagrams of the EIS domain model, each presenting a view of one data category. Each view shows, for that data category, the EIS entities in boxes and their relationships to one another using directional lines. An entity may or may not be directly represented by a table in the EIS entity-relationship-diagram (ERD) model. Entities are objects or data

<div style="border:1px solid; background:#ccffcc; padding:4px;">

Important Note

This section of the NEIP contains information **ONLY** on the EIS domain, and not the entire CERS domain. There are numerous entities in the CERS domain that are not used for reporting data to the EIS. For complete information on the CERS domain, see Appendix 2, "CERS and Examples."

</div>

abstractions that have identity and contain value data. The number of occurrences possible for each relationship, or *multiplicity*, is also shown. The table in Figure 5-28 explains how to read the diagrams. Phrases describing the relationship between these entities should be read in the direction of the arrow. For example, in Figure 5-29, the relationship between the Emissions Unit and Emissions Process entities is read as: "An Emissions Unit has at least one Emissions Process."

Figure 5-28
Domain Model Multiplicity

Indicator	Meaning	Explanation
0..1	Zero or one	The relationship may exist once.
1	One only	The relationship must exist, and can only exist once.
0..*	Zero or more	The relationship does not have to exist, but may exist more than once.
1..*	One or more	The relationship must exist, and can exist more than once.

5.8.2 Facility Inventory Domain View

Figure 5-29 is a diagram showing the facility inventory view of the EIS domain model. The facility inventory data category consists of the facility site, emissions units, emissions processes, release points, and the control approaches used to reduce emissions. In addition, regulatory programs are reported here that are applicable to either an emissions unit or an emissions process.
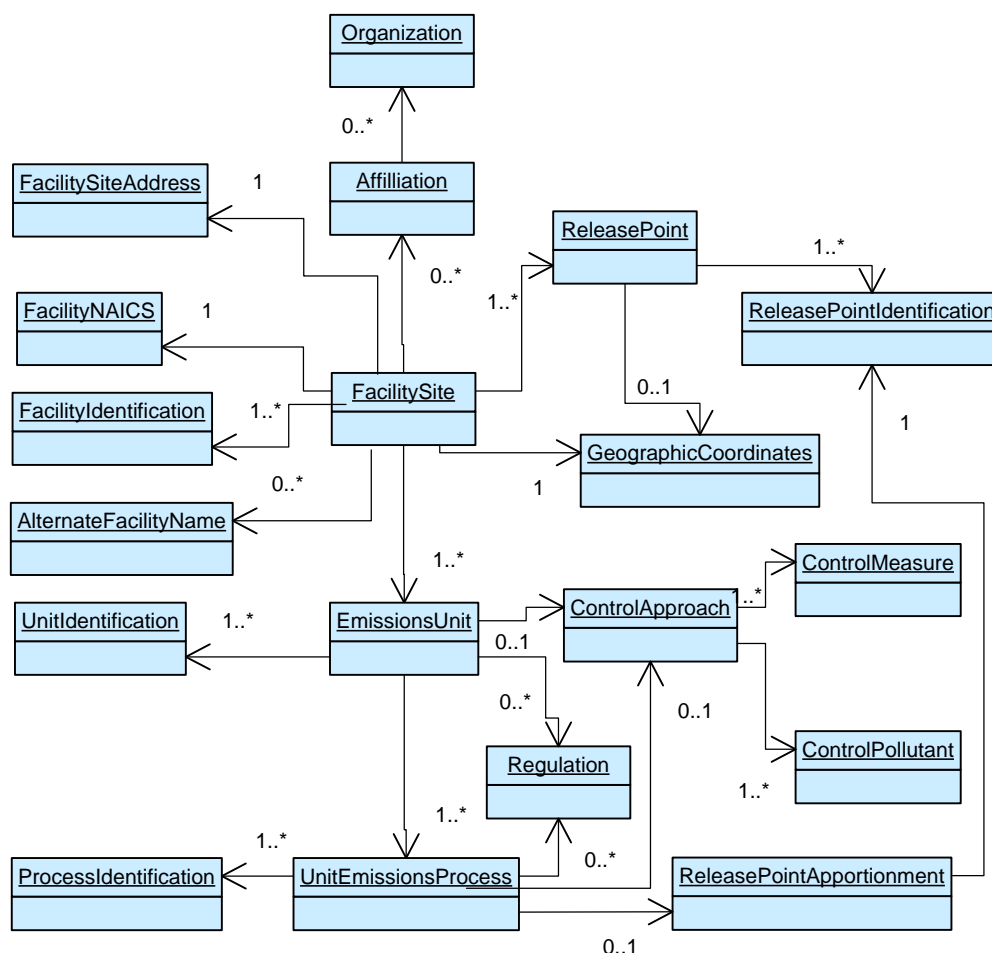
A **FacilitySite** describes the stationary source where emissions activities occur. A **FacilitySite** is known by its EIS Identifier and/or by the S/L/T agency assigned identifier and are referenced accordingly by **FacilityIdentification**. Other **FacilityIdentification** may come for other data sources which the S/L/T will not provide. These include identifiers from the CAMD Business System (CBS), and the Federal Registry System (FRS). The locality of the site is identified by one **FacilitySiteAddress** and one **GeographicalCoordinates** record which provide the latitude and longitude measures of the site. The facility site may also be known by other

AlternativeFacilityNames which an S/L/T may report. This information is provided from the local S/L/T information system. The **Affiliation** between a **FacilitySite** and an **Organization** may be reported.

A **FacilitySite** must always indicate at least one **EmissionsUnit** to report emissions. An **EmissionsUnit** may be known by its EIS identifier and/or by other **UnitIdentification** which an S/L/T may report. As with **FacilityIdentification**, other **UnitIdentification** not submitted by S/L/Ts will be included in the EIS. These identifiers are provided from other agency data systems, such as the CBS. The **EmissionsUnit** is associated with one or more **UnitEmissionsProcess** which are known by EIS or SLT **ProcessIdentification**. **EmissionsUnits** and **UnitEmissionsProcesses** may be controlled by various emissions reduction techniques. This is known as a **ControlApproach**. An **EmissionsUnit** or a **UnitEmissionsProcess** can have no more than one active **ControlApproach**. Each **ControlApproach** identifies one or more pollutants that are being controlled and one or more control measures that are being applied to the emissions unit or emissions process. This relationship is shown with the **ControlPollutant** and **ControlMeasure** entities respectively. A **ControlApproach** cannot be reported for both the same single emissions unit and any of its associated emissions processes.

A **UnitEmissionsProcess** is uniquely identified as a process specific to an **EmissionsUnit**, and therefore cannot be shared by multiple **EmissionsUnits**. The percentage of emissions from an emissions process can be apportioned to one or more release points. This is shown with the **ReleasePointApportionment** entity. **ReleasePoints** at a facility site are described by their type (stack or fugitive) and geographic coordinates. **ReleasePoints** may be known by its EIS identifier and/or by other **ReleasePointIdentification**. If a facility site is subject to any federal or non-federal regulatory program or **Regulation**, these can be reported for an **EmissionsUnit** or a **UnitEmissionsProcess** at the facility site. For more information reporting facility inventory see Section 6, "Reporting Instructions for Facility Inventory."

Figure 5-29
**Facility Inventory Domain View**

5.8.3 Point Emissions

The point emissions domain view (Figure 5-30) shows the entities that are used for reporting emissions for those stationary sources defined in the facility inventory domain.

To report point emissions, the **FacilitySite** must be present in the EIS. These facility sites are identified by their **FacilityIdentification**. To report emissions, you must always report the **EmissionsUnit** (through the use of its **UnitIdentification**) and its associated **UnitEmissionsProcesses**.

Each **UnitEmissionsProcess** is identified by its **ProcessIdentification** and may be associated with several **ReportingPeriods** for which emissions occur. For more information on the specific reporting time period types see Section 7, "Reporting Instructions for Point Emissions." For each **ReportingPeriod** a single set of **OperatingDetails** may be reported. These data should support the calculation methodologies and supporting parameters used to estimate emissions. **SupplementalCalculationParameter** data may also be reported for combustion sources. **Emissions** are reported for each pollutant for each reporting period.

Figure 5-30
Point Emissions Domain View
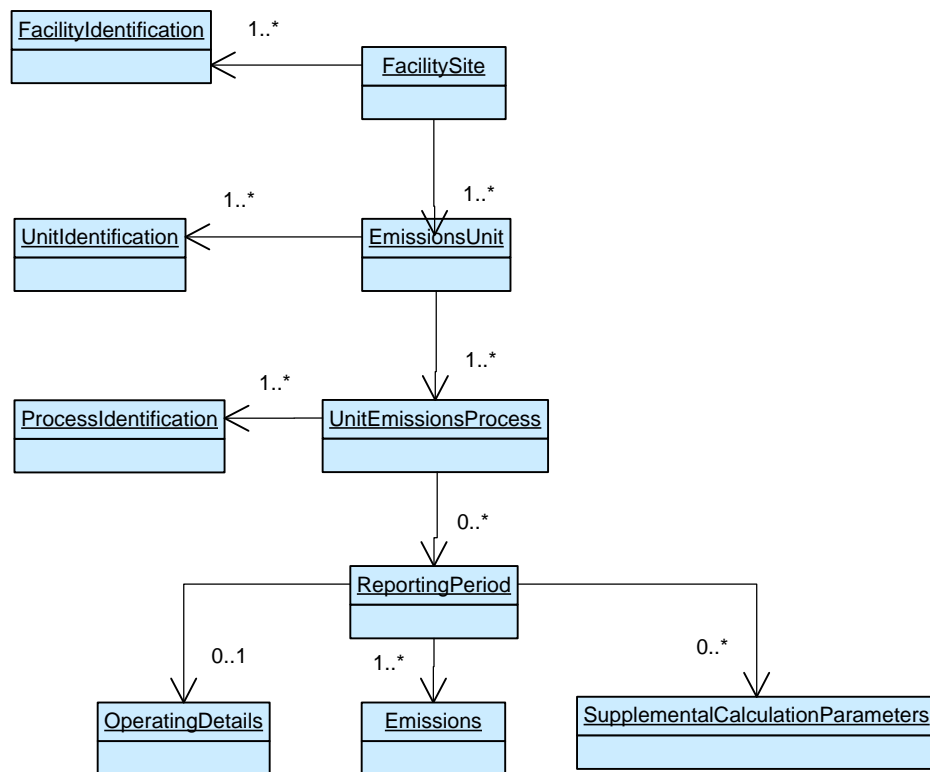
### 5.8.4 Nonpoint Emissions

The nonpoint emissions domain view (Figure 5-31) contains the entities needed to report nonpoint emissions.

Nonpoint sources are defined by their geographic area identifiers which are specified in the **Location** complex type. The geographic boundaries are usually State and County FIPS code or Tribal code, but additional capabilities do exist (see Section 8, "Reporting Instructions for Nonpoint Emissions.") A **Location** for nonpoint emissions may have an **ExcludedLocationParameter** which identify one or more other locations for which another Agency is expected to submit emissions to the EIS and for which you are not reporting emissions.

An S/L/T must report a nonpoint **Location** with at least one **LocationEmissionsProcess**. In some cases a **Location** may also have associated **ExcludedLocationParameter** data. A **LocationEmissionsProcess** may have **Emissions** associated with different **ReportingPeriods**. For each **ReportingPeriod** a single set of **OperatingDetails** may be reported. These data should support the calculation methodologies and supporting parameters used to estimate emissions. **SupplementalCalculationParameter** data may also be reported for combustion sources. **Emissions** are reported for each pollutant for each reporting period.

In addition to reporting emissions, nonpoint submissions may include information pertaining to controls that are applicable to nonpoint emissions processes. This is known as a **ControlApproach**. A **LocationEmissionsProcess** can have no more than one active **ControlApproach**. Each **ControlApproach** identifies one or more **ControlPollutants** that are being controlled and one or more **ControlMeasures** that are being applied to the **LocationEmissionsProcess**. **Regulations** may also be reported for a **LocationEmissionsProcess**.

Figure 5-31
**Nonpoint Emissions Domain View**
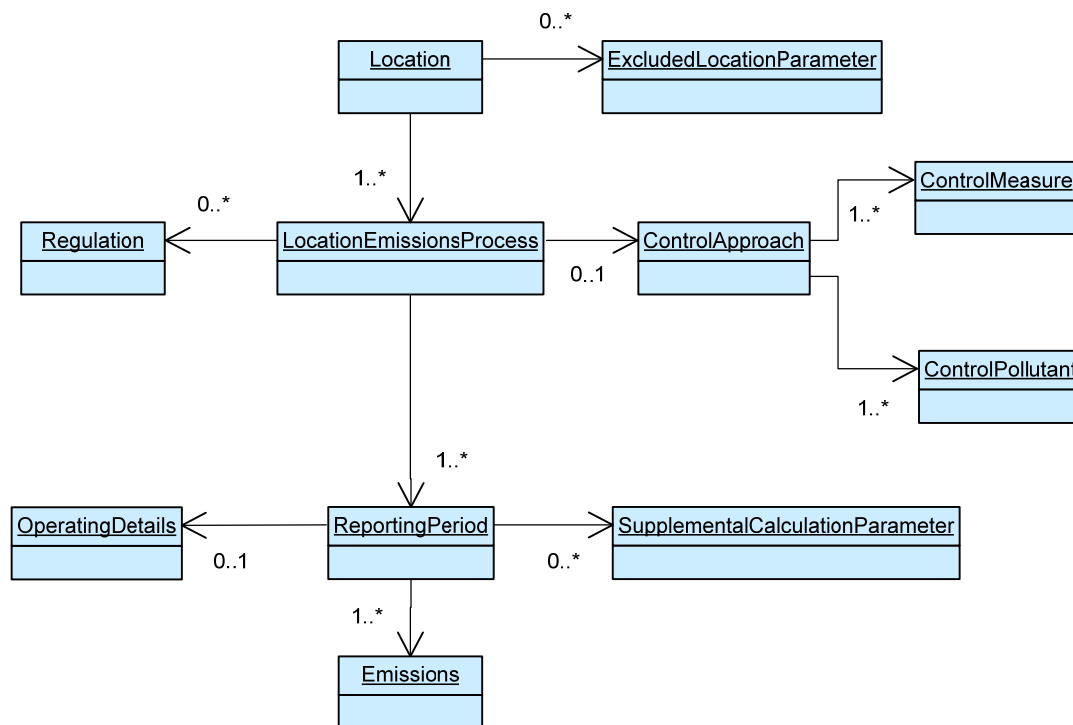
5.8.5 Onroad and Nonroad Emissions

The onroad/nonroad emissions domain view (Figure 5-32) contains the entities needed to report information from models that generate Onroad/Nonroad emissions. Onroad emissions are emissions from vehicles that operate on public roadways. Nonroad emissions are emissions from vehicles and equipment that operate off of public roadways. The **Location** for which both activity and emissions data are submitted is most commonly defined by a State and County FIPS code or Tribal code, but exceptions do exist. See Section 10, "Reporting Instructions for Onroad and Nonroad Emissions."

Both Onroad and Nonroad emissions must report at least one **LocationEmissionsProcess**. A **LocationEmissionsProcess** can be reported for at least one but no more than two different ReportingPeriods. For more information on the specific

ReportingPeriod types see Section 10, "Reporting Instructions for Onroad and Nonroad Emissions." **Emissions** are reported for each pollutant for each **ReportingPeriod**.

**Figure 5-32
Onroad, Nonroad Emissions Domain View**
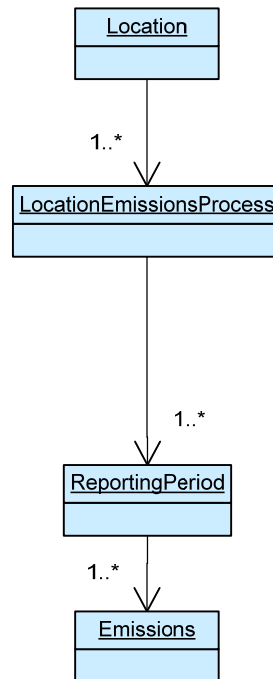
5.8.6 Events

The event domain view (Figure 5-33) contains the entities needed to report emissions resulting from short-term events such as wildfires, prescribed fires, and other non-fire events. These events are reported by their **Event** Identifier which is unique for each event and generally assigned by the land manager who is responsible for the event.

MergedEvents represent two or more events, previously reported as separate events, then reported as one single event complex. For fires these are descriptors that designate whether the fire is being reported as a single total aggregate set of emissions or reported in daily increments. This is reported in **EventReportingPeriod**. An event occurs at an **EventLocation** and may occur over many days. An event can be defined by either its **GeographicCoordinates** (which identify the latitude and longitude and area in which the event occurred) or by referencing **GeospatialCoordinates**. Only one these methods of reporting an Event may be used. Referencing **Geospatial Coordinates** may involve many polygon shapes that describe the size and shape of the location of the event. There can only be two shapes identified for a given day; the shape of the area that is flaming and the shape of the previous day's area that is smoldering. These points or polygon shapes are reported in an **EventAttachedFile** which contains the shapefile associated with the event. Information about the fuels, fuel conditions, combustion characteristics, and activity that produced emissions is known as

EventEmissionsProcesses. At least one **EventEmissionsProcess** is needed to report **Emissions**.

Figure 5-33
Events Domain View
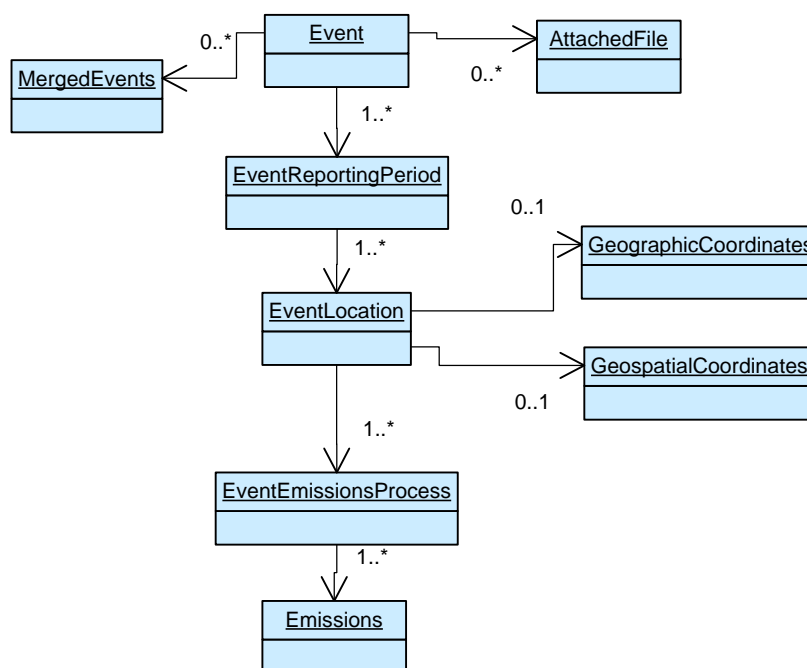
5.9 Reporting Examples

The following sections provide a selection of XML code samples that show how XML tags within the complex types are used to report EIS data. For more details on required complex types, data elements and quality assurance checks for each data category please see Sections 6 through 12.

5.9.1 Identifying a Facility Site

All facility sites are identified in the FacilityIdentification component by using either EIS Identifiers or the Agency assigned Identifiers and ProgramSystemCode along with additional location information.

The preferred method for reporting a facility site is to identify the site using only EIS Identifiers. Figure 5-34 shows and example where a facility site and an emissions unit are reported using EIS identifiers. The code represented in the following two examples is not a complete representation of a Submittal Data Block. The code snippet is presented here to demonstrate the concept of reporting identifiers within a complex type.

Figure 5-34
Identifying a Facility Site and Emissions Unit with EIS Identifiers

```
<cer:FacilityIdentification>
  <cer:FacilitySiteIdentifier>70244</cer:FacilitySiteIdentifier>
  <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
</cer:FacilityIdentification>

<cer:UnitIdentification>
  <cer:Identifier>1476821</cer:Identifier>
  <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
</cer:UnitIdentification>
```

Alternately, an Agency that chooses not to store EIS Identifiers in their local system may instead report a unique facility site using the FacilitySiteIdentifier in conjunction with their ProgramSystemCode, and report as well their StateandCountyFIPSCode, StateandCountryFIPSCode, or TribalCode.

Figure 5-35
Identifying a Facility Site Using Agency Identifiers

```
<cer:FacilityIdentification>
  <cer:FacilitySiteIdentifier>176428</cer:FacilitySiteIdentifier>
  <cer:ProgramSystemCode>IN DEQ</cer:ProgramSystemCode>
  <cer:StateAndCountyFIPSCode>18125</cer:StateAndCountyFIPSCode>
</cer:FacilityIdentification>
```

While the FacilitySite complex type contains additional information about a facility site, it does not uniquely identify the facility site. Identifying the facility site can only be accomplished by reporting identifiers in the FacilityIdentification complex type.

5.9.2 Reporting Point Emissions

Once a facility site, emission units, emission processes, and emission release points have been reported to the EIS, point emissions can be submitted using just their identifiers.

The hierarchy of the CERS links the facility site, emissions unit, and emissions process to point emissions without the need to resubmit the Agency's entire facility inventory. An Agency need only supply the identifying information required to uniquely identify each facility site, emissions unit, emissions process, and then the emissions for the reporting period.

The following example shows how a State Agency would supply the required information to link emissions using the CERS identifiers from previously submitted facility inventory.

Figure 5-36
Reporting Point Emissions Using EIS Identifiers

```
<cer:FacilitySite>
 <cer:FacilityIdentification>
   <cer:FacilitySiteIdentifier>176428</cer:FacilitySiteIdentifier>
   <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
 </cer:FacilityIdentification>
 <cer:EmissionsUnit>
   <cer:UnitIdentification>
     <cer:Identifier>1476821</cer:Identifier>
     <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
   </cer:UnitIdentification>
   <cer:UnitEmissionsProcess>
     <cer:ProcessIdentification>
       <cer:Identifier>1478909</cer:Identifier>
       <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
     </cer:ProcessIdentification>

<cer:ReportingPeriod>
 <cer:ReportingPeriodTypeCode>A</cer:ReportingPeriodTypeCode>
 <cer:EmissionOperatingTypeCode>R</cer:EmissionOperatingTypeCode>
 <cer:CalculationParameterTypeCode>I</cer:CalculationParameterTypeCode>
 <cer:CalculationParameterValue>1475683</cer:CalculationParameterValue>
 <cer:CalculationParameterUnitofMeasure>TON</cer:CalculationParameterUnitofMeasure>
 <cer:CalculationMaterialCode>717</cer:CalculationMaterialCode>
 <cer:CalculationDataYear>2008</cer:CalculationDataYear>
 <cer:CalculationDataSource>Dept. of Energy production records.</cer:CalculationDataSource>
 <cer:ReportingPeriodComment>Dept. of Energy production records.</cer:ReportingPeriodComment>
 <cer:OperatingDetails>
  <cer:ActualHoursPerPeriod>8025</cer:ActualHoursPerPeriod>
  <cer:AverageDaysPerWeek>7</cer:AverageDaysPerWeek>
  <cer:AverageHoursPerDay>24</cer:AverageHoursPerDay>
  <cer:AverageWeeksPerPeriod>52</cer:AverageWeeksPerPeriod>
 </cer:OperatingDetails>
 <cer:ReportingPeriodEmissions>
  <cer:PollutantCode>NOX</cer:PollutantCode>
  <cer:TotalEmissions>2195.9</cer:TotalEmissions>
  <cer:EmissionsUnitofMeasureCode>TON</cer:EmissionsUnitofMeasureCode>
  <cer:EmissionCalculationMethodCode>1</cer:EmissionCalculationMethodCode>
 </cer:ReportingPeriodEmissions>
</cer:ReportingPeriod>
```

5.9.3 Reporting Nonpoint Emissions

Nonpoint data must be reported using the Location complex type. The following
example shows a State reporting their emissions for a single County and SCC . A real-world
submission would include multiple pollutants for this SCC.

Figure 5-37
Reporting Nonpoint Emissions

```
<cer:Location>
    <cer:StateAndCountyFIPSCode>53067</cer:StateAndCountyFIPSCode>
    <cer:LocationEmissionsProcess>
      <cer:SourceClassificationCode>2420000055</cer:SourceClassificationCode>
```

5.9.4 Reporting Onroad/Nonroad Emissions

Onroad and nonroad emissions are submitted using the same XML structure as nonpoint emissions. This is done by identifying a location, SCC and emissions type, and reporting period for emissions. However, since emissions for onroad/nonroad often are generated from mobile models, information regarding the model used should be reported using the EIS root elements. See Section 9, "Reporting Onroad and Nonroad Emissions."

The following example shows an onroad source being reported for a County. The data was generated from NMIM. This information is shown in the CER root elements. For the purposes of this example, a single County is shown, with one SCC and emission type, one reporting period and one pollutant reported. A real-world submission would show multiple SCCs each with multiple emissions reported for every month.

Figure 5-38
Reporting Onroad Emissions

```
<cer:Model>NMIM</cer:Model>
<cer:ModelVersion>20060310</cer:ModelVersion>
<cer:EmissionsCreationDate>2009-06-02</cer:EmissionsCreationDate>
<cer:Location>
  <cer:StateAndCountyFIPSCode>13043</cer:StateAndCountyFIPSCode>
  <cer:LocationEmissionsProcess>
    <cer:SourceClassificationCode>2201070210</cer:SourceClassificationCode>
    <cer:EmissionsTypeCode>B</cer:EmissionsTypeCode>
    <cer:ReportingPeriod>
      <cer:ReportingPeriodTypeCode>A</cer:ReportingPeriodTypeCode>
      <cer:CalculationParameterTypeCode>E</cer:CalculationParameterTypeCode>
      <cer:CalculationParameterValue>1234567890</cer:CalculationParameterValue>
      <cer:CalculationParameterUnitofMeasure>TON</cer:CalculationParameterUnitofMeasure>
      <cer:CalculationMaterialCode>792</cer:CalculationMaterialCode>
      <cer:CalculationDataYear>2008</cer:CalculationDataYear>
      <cer:CalculationDataSource></cer:CalculationDataSource>
      <cer:ReportingPeriodEmissions>
        <cer:PollutantCode>CO</cer:PollutantCode>
        <cer:TotalEmissions>0.29783</cer:TotalEmissions>
        <cer:EmissionsUnitofMeasureCode>TON</cer:EmissionsUnitofMeasureCode>
        <cer:EmissionFactor>2.912</cer:EmissionFactor>
        <cer:EmissionFactorNumeratorUnitofMeasureCode>KG</cer:EmissionFactorNumeratorUnitofMeasureCode>
        <cer:EmissionFactorDenominatorUnitofMeasureCode>TON</cer:EmissionFactorDenominatorUnitofMeasureCode>
        <cer:EmissionCalculationMethodCode>4</cer:EmissionCalculationMethodCode>
      </cer:ReportingPeriodEmissions>
    </cer:ReportingPeriod>
  </cer:LocationEmissionsProcess>
</cer:Location>
```

5.9.5 Reporting Locomotives and Commercial Marine Vessels Emissions

One of the ways emissions for locomotives and commercial marine vessel can be reported is by associating them with a shape. This is done by reporting the shapefile identifier for the line segment of the track or the shape identifier of the shipping port, and then reporting the associated emissions. The library of shape identifiers for these line segments and ports are available on the EIS Gateway. The following example shows how to include the shape identifier within the location complex type for identifying a locomotive line segment.

Figure 5-39
Reporting a Shape Identifier for Locomotive Segments

```
<cer:Location>
  <cer:StateAndCountyFIPSCode>13043</cer:StateAndCountyFIPSCode>
  <cer:ShapeIdentifier>23799</cer:ShapeIdentifier>
```

5.9.6 Excluding a Location

The following example shows how the County of St. Louis in Minnesota has excluded the tribal lands of the Fond du Lac Band of Chippewa from an emissions submission.

Figure 5-40
Excluding a Location

```
<cer:Location>
  <cer:StateAndCountyFIPSCode>37035</cer:StateAndCountyFIPSCode>
  <cer:ExcludedLocationParameter>
    <cer:LocationTypeCode>CTI</cer:LocationTypeCode>
    <cer:LocationParameter>37035102.02</cer:LocationParameter>
  </cer:ExcludedLocationParameter>
  <cer:LocationEmissionsProcess>
    <cer:SourceClassificationCode>2265001030</cer:SourceClassificationCode>
    <cer:EmissionsTypeCode>B</cer:EmissionsTypeCode>
    <cer:ProcessComment></cer:ProcessComment>
    <cer:ReportingPeriod>
      <cer:ReportingPeriodTypeCode>A</cer:ReportingPeriodTypeCode>
      <cer:CalculationParameterTypeCode>E</cer:CalculationParameterTypeCode>
      <cer:CalculationParameterValue>1234567890</cer:CalculationParameterValue>
      <cer:CalculationParameterUnitofMeasure>TON</cer:CalculationParameterUnitofMeasure>
      <cer:CalculationMaterialCode>792</cer:CalculationMaterialCode>
      <cer:CalculationDataYear>2008</cer:CalculationDataYear>
      <cer:ReportingPeriodEmissions>
        <cer:PollutantCode>CO</cer:PollutantCode>
        <cer:TotalEmissions>2.0711</cer:TotalEmissions>
        <cer:EmissionsUnitofMeasureCode>TON</cer:EmissionsUnitofMeasureCode>
        <cer:EmissionFactor>2.912</cer:EmissionFactor>
        <cer:EmissionFactorNumeratorUnitofMeasureCode>KG</cer:EmissionFactorNumeratorUnitofMeasureCode>
        <cer:EmissionFactorDenominatorUnitofMeasureCode>TON</cer:EmissionFactorDenominatorUnitofMeasureCode>
        <cer:EmissionCalculationMethodCode>4</cer:EmissionCalculationMethodCode>
        <cer:EmissionsComment>Local emission factor created during SIP development.</cer:EmissionsComment>
      </cer:ReportingPeriodEmissions>
    </cer:ReportingPeriod>
  </cer:LocationEmissionsProcess>
</cer:Location>
```

5.9.7 Apportioning Emissions to Release Points

To report emissions from a process that is producing emissions from units that are physically routed to multiple release points, report the percent of emissions that are apportioned to each release point in the ReleasePointApportionment complex type. The following example shows emissions being vented to two stacks. The total apportionment must equal 100%. Note how percents are reported as decimals.

Figure 5-41
Apportioning Emissions to Multiple Release Points

```
<cer:EmissionsUnit>
  <cer:UnitTypeCode>999</cer:UnitTypeCode>
  <cer:UnitStatusCode>OP</cer:UnitStatusCode>
  <cer:UnitIdentification>
    <cer:Identifier>47600913</cer:Identifier>
    <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
  </cer:UnitIdentification>
  <cer:UnitEmissionsProcess>
    <cer:SourceClassificationCode>31000104</cer:SourceClassificationCode>
    <cer:ProcessIdentification>
      <cer:Identifier>19379009</cer:Identifier>
      <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
    </cer:ProcessIdentification>
    <cer:ReleasePointApportionment>
      <cer:AveragePercentEmissions>50.0</cer:AveragePercentEmissions>
      <cer:ReleasePointApportionmentIdentification>
        <cer:Identifier>900006</cer:Identifier>
        <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
      </cer:ReleasePointApportionmentIdentification>
    </cer:ReleasePointApportionment>
    <cer:ReleasePointApportionment>
      <cer:AveragePercentEmissions>50.0</cer:AveragePercentEmissions>
      <cer:ReleasePointApportionmentIdentification>
        <cer:Identifier>900007</cer:Identifier>
        <cer:ProgramSystemCode>EIS</cer:ProgramSystemCode>
      </cer:ReleasePointApportionmentIdentification>
    </cer:ReleasePointApportionment>
  </cer:UnitEmissionsProcess>
</cer:EmissionsUnit>
```

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