

Sharing Facility Data Between Air Data Systems

Definitions for sharing data among the Compliance and Emissions Data Reporting
Interface, the Facility Registry Service, and the Emissions Inventory System

Marc Houyoux

U.S. EPA

Office of Air Quality Planning and Standards
Emissions Inventory and Analysis Group

2/25/2019

Table of Contents

1	Introduction	1
2	Facility-Level Data	2
2.1	Facility Coordinates (Latitude/Longitude)	4
2.2	Operating Status	5
2.3	NAICS Codes	6
3	Units	6
3.1	Alternative Unit ID	8
3.2	Indirect mapping between FRS and EIS for some fields	8
3.2.1	Unit Type	8
3.2.2	Capacity Unit of Measure	8
3.2.3	Unit Operating Status	9
4	Release Points	10
4.1	Alternative Release Point IDs	10
4.2	Release Point Types	11
4.3	Non-fugitive Release Points	11
4.4	Fugitive Vent Release Points	12
4.5	Fugitive Two-Dimensional Release Points	13
4.6	Fugitive Three-Dimensional Release Points	15
4.7	Summary of release point parameters, including historical fugitive area releases	16
5	Processes	18
6	Control Measures	19
6.1	Control Measure Type	20
6.2	Pollutants	21

List of Tables

Table 1: Facility-Level Widget Data Fields, Definitions, and Associated EIS Data Field Names.....	3
Table 2: FRS Operating Statuses Mapped to EIS Operating Status Codes	6
Table 3: Unit-Level Widget Data Fields, Definitions, and Associated EIS Data Field Names	7
Table 4: Unit Design Capacity Unit of Measure Mapped to Codes and Descriptions in EIS	9
Table 5: Unit Operating Status Mapped to Codes and Descriptions in EIS.....	10
Table 6: Release Point fields in the Facility Widget Shared by All Release Point Types, Definitions, and Associated EIS Data Field Names	10
Table 7: Release Point Types Mapped to Codes and Descriptions in EIS	11
Table 8: Release Point Data Fields for Non-Fugitive Releases, Definitions, and Associated EIS Data Field Names.....	12
Table 9: Release Point Data Fields for Fugitive Vent Releases and Definitions.....	12
Table 10: Release Point Data Fields for Fugitive Two-Dimensional Releases and Definitions	13
Table 11: Release Point Data Fields for Fugitive Three-Dimensional Releases and Definitions.....	15
Table 12: Summary of Release Parameters Needed for Each Fugitive Release Point Type, Constraints on Values, and Examples.....	17
Table 13: Process-Level Widget Data Fields, Definitions, and Associated EIS Data Field Names.....	18
Table 14: Control Measure Widget Data Fields, Definitions, and Associated EIS Data Field Names	20
Table 15: Selected EIS Pollutants Available in the Facility Widget	21

List of Figures

Figure 1: First Page of Facility Widget as Access from the CEDRI Application.....	2
Figure 2: Example 1 of Fugitive Two-Dimensional Release	14
Figure 3: Example 2 of Fugitive Two-Dimensional Release	15
Figure 4: Example of Fugitive Three-dimensional Release	16

1 Introduction

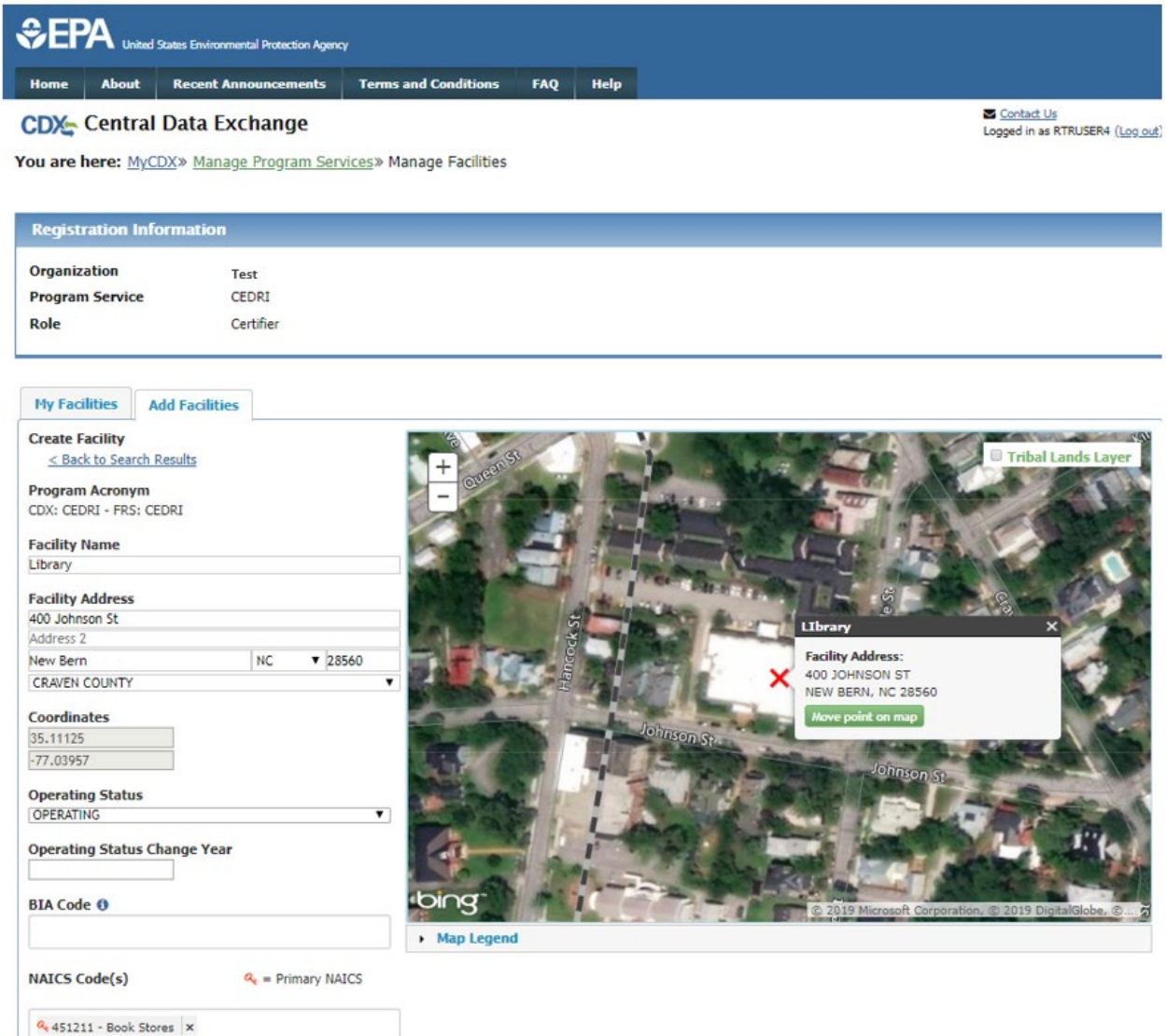
The EPA E-Enterprise for the Environment program is a collaborative partnership between the EPA and the Environmental Counsel of States (ECOS). E-Enterprise seeks to help the regulated community more readily comply with existing regulatory requirements through improved workflow streamlining using modern approaches and technologies. To this end, the Facility Registry Service (FRS) is available from the EPA, so environmental programs can share information about facilities that have environmental impact. Environmental programs can include all environmental media (e.g., water, air, solid waste) and programs at state, local, tribal agencies and at the EPA. The FRS promotes sharing the data, but the information to share must be well-defined and matched across programs to allow effective sharing. This document seeks to define and match facility data fields among the FRS, the Compliance and Emissions Data Reporting Interface (CEDRI), and the Emissions Inventory System (EIS) used to create the National Emissions Inventory (NEI). To a lesser extent, we also address here facility-level fields included as part of these programs and the Toxics Release Inventory (TRI).

The E-Enterprise Combined Air Emissions Reporting (CAER) project is seeking to streamline emissions reporting across the NEI, TRI, CEDRI, and Greenhouse Gas Reporting Program (GHGRP). As part of that effort, many facility data needs have been identified that will help promote shared reporting. The E-Enterprise Facility Team is also working to address the needs of the CAER team and to define business rules for sharing facility data across EPA and state, local, and tribal environmental programs. Since those projects are not complete, this document attempts to provide information to support facility data sharing in advance of more formal business rules and systems that are implemented by future data systems.

This document provides tables with definitions for data fields that users see when they use the Facility Widget. An image of the first webpage of that Widget is shown in Figure 1 below, which illustrates some of the fields associated with the facility. These fields are “facility-level” fields, which means that they are attributes of the entire facility, as compared to attributes of just a part of the facility. The tables provide “Facility Widget Labels” in the left most column. These labels are the words that appear on the widget user interface (exemplified by Figure 1). Other systems may use similar or completely different names for the same data field, and so mapping field names is needed in many cases. Here, we provide mapping to the data fields used by the EIS, to promote understanding and the optional data entry of information that can be shared more readily.

This document also provides definitions and mapping to EIS for sub-facility data fields, called “components” in the FRS. Sub-facility component data in FRS (and therefore the Facility Widget and CEDRI) include units, release points, processes, and control measures. Definitions for these are available in the tables within the sub-sections below.

Figure 1: First Page of Facility Widget as Access from the CEDRI Application



2 Facility-Level Data

The Facility Widget used for TRI and CEDRI collects facility data that are stored in the FRS. The fields listed in Table 1 below include those facility-level fields that can be provided via the Widget along with the definition of the data fields¹. The right-most column in Table 1 provides the name of the mapped EIS CDX Schema Field that is used to gather data for the NEI.

¹ The widget labels are not necessarily the same as a data field name in the FRS database or in associated web services used to transfer the data to and from the FRS database.

Table 1: Facility-Level Widget Data Fields, Definitions, and Associated EIS Data Field Names

Facility Widget Label	Definition	EIS Data Field Name
EPA Registry ID	An ID that FRS assigns for a facility's Registry Record, which is the top-level record in the FRS database and which links program data for the same facility that has been sent to FRS.	n/a
Program ID	The Facility ID used by the reporting program sending data to FRS. For CEDRI, this is the CEDRI ID, whereas for EIS, this is the EIS ID.	EIS ID
Facility Name (Text 150)	The public or commercial name of a facility (i.e., the full name that commonly appears on invoices, signs, or other business documents, or as assigned by the state when the name is ambiguous).	Facility Site Name
Facility Address 1 (Text 100)	The address that describes the physical (geographic) location of the front door or main entrance of a facility site, including urban-style street address or rural address.	Location Address Text
Facility Address 2 (Text 100)	The text that provides additional information about a place, including a building name with its secondary unit and number, an industrial park name, an installation name or descriptive text where no formal address is available.	Supplemental Location Text
City (Text 60)	The name of the city, town, village or other locality, when identifiable, within whose boundaries (the majority of) the facility site is located. (This is not always the same as the city used for USPS mail delivery).	Locality Name
State (Text 5)	The alphabetic codes that represent the name of the principal administrative subdivision of the United States.	Location Address State Code
ZIP Code (Text 14)	The combination of the five-digit Zone Improvement Plan (ZIP) code and the four-digit extension code (if available).	Location Address Postal Code
County (Text, 35)	The name of the county or county equivalent in which the facility is located.	n/a
Latitude (Number 9,6)	The measure of the angular distance on a meridian north or south of the equator. See also Section 2.1.	Latitude Measure
Longitude (Number 10,6)	The measure of the angular distance on a meridian east or west of the prime meridian. See also Section 2.1.	Longitude Measure
Operating Status (Text 20)	The operating status of the facility.	Facility Site Status Code Indirect: See Section 2.2.

Facility Widget Label	Definition	EIS Data Field Name
Operating Status Change Year (Number 4)	The date that the current operating status became applicable.	Facility Site Status Code Year
BIA Code (or EPA Tribal ID for Alaskan facilities) (Text 3)	The code that represents the American Indian tribe, band, or Alaskan Native entity. Permissible values for the Tribal Code data element are based on the BIA official list of tribal codes, e.g., 007 (St. Regis Band of Mohawk Indians of New York) or F09 (Birch Creek Tribe).	Tribal Code
NAICS Code(s) (Text 6 for each code)	The code that represents a subdivision of an industry that accommodates user needs in the United States (six-digits). See also Section 2.3.	NAICS Code
Mailing Address 1 (Text 100)	<i>If not the same as the facility location address,</i> the address that describes the physical (geographic) location of mail receipt for the facility, including urban-style street address or rural address.	
Mailing Address 2 (Text 100)	<i>If not the same as the facility location address,</i> the text that provides additional information about mailing location, including a building name with its secondary unit and number, an industrial park name, an installation name or descriptive text where no formal address is available.	
Mailing City (Text 30)	<i>If not the same as the facility location address,</i> the city for the mailing address (not the city location of the facility).	
Mailing State (Text 5)	<i>If not the same as the facility location address,</i> the state postal code for the mailing address (not the location of the facility).	
Mailing ZIP (Text 14)	<i>If not the same as the facility location address,</i> the 5-digit ZIP code including the 4-digit extension code (if available) for the mailing address (not the location of the facility).	
Responsible Agency Facility ID	The Facility ID assigned by the state, local, or tribal agency that governs operations of the facility.	Facility Site Identifier
Responsible Agency	The name of the state, local, or tribal agency that governs the operations of the facility.	

2.1 Facility Coordinates (Latitude/Longitude)

Facility coordinates provide the location of a facility. Since facilities take up more space than a single point on a map, facility coordinates are by their nature an inexact concept. This section documents the

uses for facility coordinates for relevant data systems and programs, so that stakeholders who provide this information to the EPA can better understand how these data are used.

Facility coordinates are used in two ways by the EPA for the systems addressed in this document (FRS, EIS, CEDRI, and TRI). First, facility coordinates are used for electronic mapping. For this purpose, facility coordinates are best positioned at the center of a facility. This purpose is observed in mapping tools provided by the FRS using data from all programs, for TRI mapping applications, and for mapping data from the NEI.

Second, facility coordinates are used to provide a default location for sub-facility information, such as stacks and fugitive release vents, for use in air quality modeling. When release point data provided to the EIS do not include individual latitudes and longitudes, the EIS assigns the facility coordinates to each of the release points in NEI data that are used for air quality modeling. Such air quality modeling may inform risk analyses, including the National Air Toxics Assessments (NATA), where locations of emissions releases can have a large impact on the risks predicted from a facility. For this purpose, facility coordinates may be best put in the center of the key *emissions generating parts of a facility*, which may not be the center of the facility, particularly for facility sites that are very spread out.

2.2 Operating Status

Operating status denotes the status of the facility in the context of a given program. Since different programs have different definitions of facility, it is possible that different statuses exist for the same facility but associated with different programs. The following list provides the facility statuses available from the Facility Widget along with their working definitions.

- Planned – The facility is planned, but construction has not yet started. A permit may be in place, or this status may be used when an initial permit application is in process.
- Under Construction – The facility has a construction permit (if applicable) and its construction has started.
- Operating – The facility is operating (and has an operating permit, if applicable).
- Seasonal – The facility operates intermittently or only during some seasons of the year.
- Temporarily Closed – The facility is not operating, but an operating permit still exists (if applicable), and operations could resume at any time.
- Permanently Closed – The facility is not operating; a valid permit no longer exists, and/or the facility as described by the data has been dismantled.

As deployed in the CEDRI system, the Facility Widget allows users to provide the FRS operating statuses listed above. In Table 2 below, these FRS operating statuses are mapped to the EIS Operating Status Codes. Since the NEI program only collects emissions data once a facility is operating, not all available FRS statuses map to the statuses available in the EIS.

Table 2: FRS Operating Statuses Mapped to EIS Operating Status Codes

FRS Facility-level Operating Status	EIS Facility Site Status Code
Planned	n/a – EIS only accepts data for sources that are emitting
Under Construction	Usually, n/a; Could be OP (Operating) in the atypical case that a facility is reporting construction-related emissions
Operating	OP (Operating) or ONP (Operating but reporting as a nonpoint ² source) or ONRE (Operating but not reporting emissions)
Seasonal	n/a
Temporarily Closed	TS (Temporarily Shut down)
Permanently Closed	PS (Permanently Shut down)

2.3 NAICS Codes

As stated in the [TRI questions and answers](#), “a facility may be made up of several establishments each of which may have a different primary NAICS code.” According to TRI, “A primary NAICS code generally represents those goods produced or services performed by an establishment that have the highest value added.” In the case of the TRI program, more information is provided on how to determine primary NAICS because it is relevant to whether a facility is required to report to the TRI program or not.

The Facility Widget, used by both the CEDRI and TRI systems, provides users a way to provide multiple NAICS codes that are relevant to their facility. Users can set the Primary NAICS code using the Facility Widget as well.

Other programs, such as the NEI via EIS, allow a single NAICS code for each facility. Ideally, if a facility has emissions reported to the EIS and either or both of CEDRI and TRI, one of the NAICS codes used for CEDRI or TRI would be used for the emissions reported to the EIS. However, this depends on the specifics of the overlapping facilities and whether the parts of a facility generating air toxics (reported to TRI) are included as part of the facility reported to a state, local, or tribal program for the NEI.

For a specific reporting programs, the valid NAICS codes may not be the latest set of NAICS codes published by the Census Bureau. The Census Bureau updates NAICS codes every five years but reporting regulations for a given reporting period may not have been updated to use a newer version of the codes. The latest codes are available at the [Census Bureau NAICS website](#). Users submitting NAICS data to EPA for a given reporting program should refer to the guidance for that program to ensure valid codes are reported.

3 Units

Units are parts of a facility that perform some function important to the operation of the facility. Usually units are pieces of equipment that have some input (such as fuel or raw materials) and some output (such as heat, power, a transformed material, or a chemical). In the environmental context, a unit is something that performs a function but also generates emissions or other environmentally impactful output. As such, a unit can be a collection of materials, such as a pile of coal or a holding pond, that is relevant for environmental accounting purposes because it can generate fugitive emissions

² In EIS, nonpoint sources refer to data that is summed across multiple sources or origins and reported as a county total.

(dust in the case of a coal pile and evaporative emissions for a holding pond). Table 3 below provides the list of unit data fields that Facility Widget can set and how those fields map to fields in the EIS.

Table 3: Unit-Level Widget Data Fields, Definitions, and Associated EIS Data Field Names

Facility Widget Label	Definition	EIS CDX Schema Field
Unit ID	Internal ID set by the FRS.	n/a
Alternate Unit ID (Text 150)	The ID that a user provides for the unit (or group of units) that the user recognizes or is used in the originating data system. If a user wishes for their unit-level data to be able to match other data submitted to the EPA (such as the National Emissions Inventory), then users can provide the sub-facility component IDs assigned by their state, local, or tribal regulatory agency.	Unit Identifier See also Section 0.
Alternate Unit Name (Text 150)	The name that a user provides to the unit that the user recognizes or is used in the originating data system.	n/a
Unit Type Description (Text 100)	The description of the unit type code, which identifies the type of emissions unit activity. Users must select from the provided list. Unit types match those used for the NEI.	Unit Type Code Indirect: See Section 3.2.1.
Unit Description (Text 255)	Text description of the emissions unit.	Unit Description
Unit Design Capacity (Number 30)	The measure of the size of the unit based on the maximum continuous throughput capacity of the unit.	Unit Design Capacity
Capacity Unit of Measure (Text 200)	Unit of measure code for the design capacity of the emissions unit.	Unit Design Capacity Unit of Measure Code Indirect: See Section 3.2.2.
Status of Operating Permit (Text 100)	The status of the operating permit: active, inactive, or not permitted.	n/a
Permit Start Year (Number 4)	The start year of the operating permit, if applicable.	n/a
Permit End Year (Number 4)	The end year of the operating permit, if applicable.	n/a
Unit Installation Date (Date 20)	The date that the unit was installed.	n/a
Unit Operating Status (Text 100)	The operating status of the unit: planned, under construction, operating, seasonal, temporarily closed, permanently closed.	Unit Status Code Indirect: See Section 3.2.3.

3.1 Alternative Unit ID

Many alternative unit IDs can exist for a given unit, since each regulatory or data collection program can assign an ID for it. For the purposes of this document, there are two specific unit ID mappings that are useful to promoting data sharing.

When Widget users provide Alternative Unit IDs for CEDRI, the two best options for those matching to the EIS are: (1) the Responsible Agency Unit ID or (2) the EIS ID. Of these two, the Responsible Agency Unit ID is the one most likely to be known by CEDRI users, since it is the one used by the state, local, or tribal data systems when they collect emissions data for permit fees and to provide to the EPA for the NEI. The EIS ID is not usually known by CEDRI users. Both IDs are available in the process-level data provided online by the NEI program; for example, the 2014 detailed NEI data for point sources are available from the “Data Summaries” tab on the [2014 NEI data page](#). As another option, state, local, or tribal air agencies can use EIS to create “facility configuration reports” that include these IDs. These reports could be provided to industry users to facilitate unit data mapping where desired.

In some cases, the level of detail included for units differs depending on the data collection program. For example, a unit record in a state data system (and therefore EIS) that is recorded as a single unit, could in fact be three separate units in the real world. This can occur because similar units may be aggregated by a state for permitting and/or emissions reporting purposes. The details of the three separate units may be of interest to a program such as CEDRI, and in this case, mapping units across programs is more difficult. To handle these types of cases, the FRS and CAER teams are working to consider how best to use “grouping” features of the FRS data model to support communication about unit groups and other component groups.

3.2 Indirect mapping between FRS and EIS for some fields

As noted in Table 3 above, several unit-level data fields are related *indirectly* between FRS and EIS. This occurs because the EIS stores a code value and uses a separate lookup table for the fully description, while the FRS stores the full description (but not the code).

3.2.1 Unit Type

Unit types are coordinated between the Facility Widget (and CEDRI) and the EIS using a shared table of unit codes and descriptions. This is the list of unit codes and descriptions displayed to users in the Facility Widget “Unit Type” drop-down menu. This list of unit codes and descriptions can also be viewed through the EIS “Reporting Code Tables” page. For example, the unit type code stored by the EIS is “100” while the FRS stores the code as well as the associated description “Boiler”. Ongoing work as part of E-Enterprise intends to make the unit codes list available via a web service, so that FRS, CEDRI, EIS, and other systems can share it more easily and updates are available to all systems at the same time.

3.2.2 Capacity Unit of Measure

Units have a design capacity that can be captured by the Facility Widget, and in some cases, it is required to be provided by reporting programs. For example, the EIS program requires design capacity for boilers. The Capacity Unit of Measure field in the Facility Widget allows users to specify the units of measure for the value provided in the Unit Design Capacity field. The current version of the Facility Widget provides users all the valid EIS units of measure and some additional units of measure added specifically for CEDRI.

Table 4 below lists the valid units of measure for unit design capacity that are supported by the Facility Widget. It also shows the mapping to the relevant codes in the EIS and their associated descriptions. For all the currently valid EIS codes (the first 8 on the list), the units of measure descriptions have been coordinated across the Facility Widget and the EIS. The remaining units of measure shown on the list map imperfectly to EIS units of measure that were retired after the 2005 inventory year. The CAER team is considering how best to resolve this discrepancy.

Table 4: Unit Design Capacity Unit of Measure Mapped to Codes and Descriptions in EIS

Facility Widget Capacity Unit of Measure	EIS Unit Design Capacity Unit of Measure Code	EIS Description
1000 POUNDS PER HOUR	E3LB/HR	1000 POUNDS PER HOUR
BARRELS	BBL	BARRELS
BOILER HORSEPOWER	BLRHP	BOILER HORSEPOWER
GALLONS	GAL	GALLONS
HORSEPOWER	HP	HORSEPOWER
KILOWATTS	KW	KILOWATTS
MEGAWATTS	MW	MEGAWATTS
MILLION BTU PER HOUR	E6BTU/HR	MILLION BTU PER HOUR
OVEN-DRIED TONS	TON/YR	TONS PER YEAR ^a
THOUSAND BOARD-FEET PER YEAR (GLUE LAMINATED BEAMS)	E3BDFT/YR	THOUSAND BOARD-FEET PER YEAR ^a
THOUSAND CUBIC FEET PER YEAR (LVL, LSL, & PSL) ^b	E3FT3/YR	THOUSAND CUBIC FEET PER YEAR ^a
THOUSAND LINEAR FEET PER YEAR (I-JOISTS)	E3FT/YR	1000 FEET PER YEAR ^a
THOUSAND SQUARE FEET PER YEAR	E3FT2/YR	THOUSAND SQUARE FEET PER YEAR ^a
THOUSAND SQUARE FEET PER YEAR 1/2" (FIBERBOARD)	E3FT2/YR	THOUSAND SQUARE FEET PER YEAR ^a
THOUSAND SQUARE FEET PER YEAR 1/8" (HARDBOARD)	E3FT2/YR	THOUSAND SQUARE FEET PER YEAR ^a
THOUSAND SQUARE FEET PER YEAR 3/4" (MDF & PARTICLEBOARD)	E3FT2/YR	THOUSAND SQUARE FEET PER YEAR ^a
THOUSAND SQUARE FEET PER YEAR 3/8" (PLYWOOD AND OSB)	E3FT2/YR	THOUSAND SQUARE FEET PER YEAR ^a

^a As of 2/21/2019, this code has been retired from the EIS after the 2005 inventory year.

^b LVL = laminated veneer lumber; LSL = laminated strand lumber; PSL = parallel strand lumber.

3.2.3 Unit Operating Status

Unit Operating Status is like the other codes mentioned in this section, because FRS stores a full status description while the EIS stores an operating status code. Table 5 provides the relevant mapping between the two data systems. As shown in the table, the FRS Unit Operating Status values of Planned and Under Construction are not mapped to EIS values for this field. Units that are planned or under construction do not have emissions and so these are not relevant. Since the EIS accepts information about quarters of operation for units, Seasonal is treated the same as Operating by the EIS.

Table 5: Unit Operating Status Mapped to Codes and Descriptions in EIS

Facility Widget Unit Operating Status	EIS Operating Status Code	EIS Description
Planned		
Under Construction		
Operating	OP	Operating
Seasonal	OP	Operating
Temporarily Closed	TS	Temporarily Shutdown
Permanently Closed	PS	Permanently Shutdown

4 Release Points

Release points are entities located at a facility that release emissions to the environment. Release points are generally categorized as “stack” and “fugitive” releases, and there several types within those two general categories. Despite the name, release points are not all represented by a single point in space. Some fugitive release point types have attributes to describe their width, length, height, and orientation in the horizontal plane.

Different release point types have different parameters. In this section, we include separate tables to provide definitions and mapping between FRS/CEDRI and EIS. Table 6 provides the definition and cross-walk to the EIS for the two release point fields that are needed for all release point types.

Table 6: Release Point fields in the Facility Widget Shared by All Release Point Types, Definitions, and Associated EIS Data Field Names

Facility Widget Label	Definition	EIS CDX Schema Field
Release Point ID	Internal FRS ID set by the FRS	
Alternate Release Point ID (Text 150)	The ID that a user provides for the release point (or group of release points) that the user recognizes or is used in the originating data system. If a user wishes for their release point data to be able to match other data submitted to the EPA (such as the National Emissions Inventory), then users can provide the release point IDs assigned by their state, local, or tribal regulatory agency.	Release Point Identifier See also Section 4.1
Release Point Type (Text 30)	A description of the basic type of release structure. The type determines what other parameters are needed to fully describe the release point aspects that are needed for inventories.	Release Point Type Code Indirect: See Section 4.2.

4.1 Alternative Release Point IDs

Different alternative release point IDs can exist for a given unit, since each regulatory or data collection program can assign an ID for it. For the purposes of this document, there are two specific unit ID mappings that are useful to promoting data sharing.

When Widget users provide Alternative Release Point IDs for CEDRI, the two best options for those matching to the EIS are: (1) the Responsible Agency Release Point ID or (2) the EIS ID. Of these two, the Responsible Agency Release Point ID is the one most likely to be known by CEDRI users, since it is the one used by the state, local, or tribal data systems when they collect emissions data for permit fees and to provide to the EPA for the NEI. The EIS ID is not usually known by CEDRI users. Both IDs are available in the process-level data provided online by the NEI program; for example, the 2014 detailed NEI data for point sources are available from the “Data Summaries” tab on the [2014 NEI data page](#). As another option, state, local, or tribal air agencies can use EIS to create “facility configuration reports” that include these IDs. These reports could be provided to industry users to facilitate release point mapping where desired.

In some cases, the level of detail included for units differs depending on the data collection program. For example, a release point record in a state data system (and therefore EIS) that appears to be a single release point, could in fact multiple release points from the perspective of a different program. This can occur because release points may be aggregated by a state for permitting and/or emissions reporting purposes. Fugitive releases at a facility are sometimes treated this way. The details of the release points may be of interest to a program such as CEDRI, and in this case, mapping release points across programs is more difficult. As another example, all stack release points from EIS perspective must be grouped together for reporting to TRI as facility stack emissions. To handle these types of cases, the FRS and CAER teams are working to consider how best to use “grouping” features of the FRS data model to support communication about release point groups and other component groups.

4.2 Release Point Types

The release point types available in the Facility Widget and CEDRI are listed in Table 7 below. The table shows these mapped to the current release point types in the EIS (as of February 2019). The CAER team is working to align the release point types across the two systems.

Table 7: Release Point Types Mapped to Codes and Descriptions in EIS

Facility Widget Release Point Types	EIS Release Point Type Code	EIS Description
Vertical Stack	2	Vertical
Horizontal	3	Horizontal
Goose Neck	4	Goose Neck
Vertical with Rain Cap	5	Vertical with Rain Cap
Downward Facing Vent	6	Downward-facing Vent
Fugitive Area ^a	1	Fugitive
Fugitive Vent		
Fugitive Two-Dimensional		
Fugitive Three-Dimensional		

^a The ‘Fugitive Area’ Release Point Type appears in the Facility Widget only for historical data that were previously collected by the EIS or other data systems prior to the creation of the Widget. This Release Point Type cannot be used for new data entries in the Widget.

4.3 Non-fugitive Release Points

Depending on the different release point types, different fields are needed and, in some cases, have different meanings. For all non-fugitive release points (Release Point Types of vertical stack, horizontal, goose neck, vertical with rain cap, or downward facing vent), Table 8 provides a list of the remaining

fields (in addition to those defined in Table 6), their definitions, and the EIS fields to which they map. Examples of these types of release points include a stack or a powered building vent.

Table 8: Release Point Data Fields for Non-Fugitive Releases, Definitions, and Associated EIS Data Field Names

Facility Widget Label	Definition	EIS CDX Schema Field
Height (Number 5,1)	The height of the stack from the ground (measured in feet).	Release Point Stack Height Measure
Diameter (Number 7,3)	The internal diameter of the stack (measured in feet) at the release height.	Release Point Stack Diameter Measure
Velocity (Number 10,4)	The velocity of an exit gas stream.	Release Point Exit Gas Velocity Measure
Gas Flow Rate (Number 13,4)	The stack gas flow rate of an exit gas stream. This field is calculated automatically from the velocity and diameter, assuming a round stack. If users have a flow measured but not the velocity, then input the diameter first and then enter the velocity that gives the flow value that has been measured.	Release Point Exit Gas Flow Rate Measure
Temperature (Number 4)	The temperature of an exit gas stream at the point of release to the ambient air (measured in degrees Fahrenheit).	Release Point Exit Gas Temperature Measure
Latitude (Number 9,6)	The measure of the angular distance on a meridian north or south of the equator, assigned at the <i>center of the stack release point</i> .	Latitude Measure
Longitude (Number 10,6)	The measure of the angular distance on a meridian east or west of the prime meridian, assigned at the <i>center of the stack release point</i> .	Longitude Measure

4.4 Fugitive Vent Release Points

For fugitive vent release points, Table 9 provides a list of the remaining fields (in addition to those defined in Table 6) and their definitions. This release point type is intended for source areas less than 10 square feet. An example of this type of release point is a single roof vent/opening/window for building fugitives. Fugitive vents have default values set in the Widget for diameter, velocity, and flow, but these may be changed by users if values are known.

Table 9: Release Point Data Fields for Fugitive Vent Releases and Definitions

Facility Widget Label	Definition	EIS CDX Schema Field ^a
Height (Number 5,1)	The height of the center of the vent from the ground (measured in feet).	
Diameter (Number 7,3)	The diameter of the vent (measured in feet) at the release height.	
Velocity (Number 10,4)	The velocity of an exit gas stream.	
Gas Flow Rate (Number 13,4)	The stack gas flow rate of an exit gas stream. This field is calculated automatically from the velocity and diameter, assuming a round stack. If users have	

Facility Widget Label	Definition	EIS CDX Schema Field ^a
	a flow measured but not the velocity, then input the diameter first and then enter the velocity that gives the flow value that has been measured	
Temperature (Number 4)	The temperature of an exit gas stream at the point of release to the ambient air (measured in degrees Fahrenheit).	
Latitude (Number 9,6)	The measure of the angular distance on a meridian north or south of the equator, assigned at the <i>center of the stack release point</i> .	
Longitude (Number 10,6)	The measure of the angular distance on a meridian east or west of the prime meridian, assigned at the <i>center of the stack release point</i> .	

^a As of February 2019, these fields do not map to the EIS because the EIS does not support this release point type.

4.5 Fugitive Two-Dimensional Release Points

For fugitive two-dimensional release points, Table 10 provides a list of the remaining fields (in addition to those defined in Table 6) and their definitions. This release point type is intended for release points with areas greater than or equal to 10 ft². Examples of this type of release point include a waste water holding pond, a building with elongated roof vent, and a haul road.

Table 10: Release Point Data Fields for Fugitive Two-Dimensional Releases and Definitions

Facility Widget Label	Definition	EIS CDX Schema Field ^a
Height (Number 5,1)	The height from the ground at which the release occurs (measured in feet). While the release is treated as a 2-d plane, that plane can exist at a height between 1 and 1,200 feet, inclusive.	
Width (Number 6,1)	The width of the rectangular fugitive two-dimensional release. Width is always measured perpendicular to the length between the two midpoints. See also Figure 2 and Figure 3.	
Midpoint 1 Latitude (Number 9,6)	The measure of the angular distance on a meridian north or south of the equator, assigned at <i>the midpoint of one end of a rectangle shape covering the area of the release</i> .	
Midpoint 1 Longitude (Number 10,6)	The measure of the angular distance on a meridian east or west of the prime meridian, assigned at <i>the midpoint of one end of a rectangle shape covering the area of the release</i> .	
Midpoint 2 Latitude (Number 9,6)	The measure of the angular distance on a meridian north or south of the equator, assigned at <i>the midpoint of the opposite end from midpoint 1 of a rectangle shape covering the area of the release</i> .	

Facility Widget Label	Definition	EIS CDX Schema Field ^a
Midpoint 2 Longitude (Number 10,6)	The measure of the angular distance on a meridian east or west of the prime meridian, assigned at <i>the midpoint of the opposite end from midpoint 1 of a rectangle shape covering the area of the release.</i>	

^a As of February 2019, these fields do not map to the EIS because the EIS does not support this release point type.

When using the Facility Widget to define the width, midpoint 1, and midpoint 2, the map allows users to move the red “X”s on the map to set the midpoints. The width is set using the data entry box provided. The shape of the “box” shown by the Facility Widget has rounded ends, but the data provided is representing a rectangular region. As shown in Figure 2 and Figure 3, users should align the ends of the oval with the ends of the fugitive release to set the proper midpoint coordinates. Midpoints 1 and 2 can be in any orientation to one another. For example, in Figure 2, midpoint 1 is northeast of midpoint 2, whereas in Figure 3, midpoint 1 is southwest of midpoint 2.

Figure 2: Example 1 of Fugitive Two-Dimensional Release

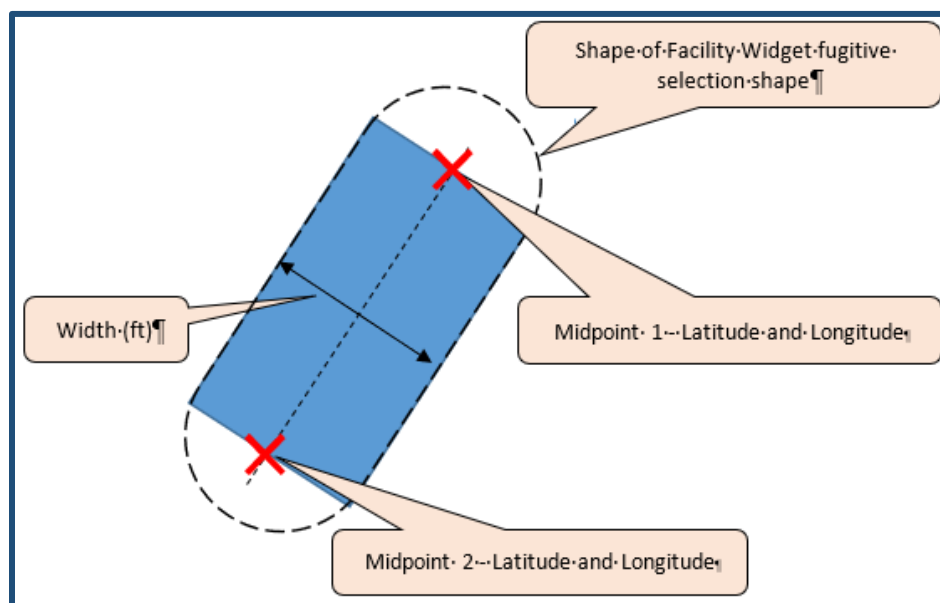
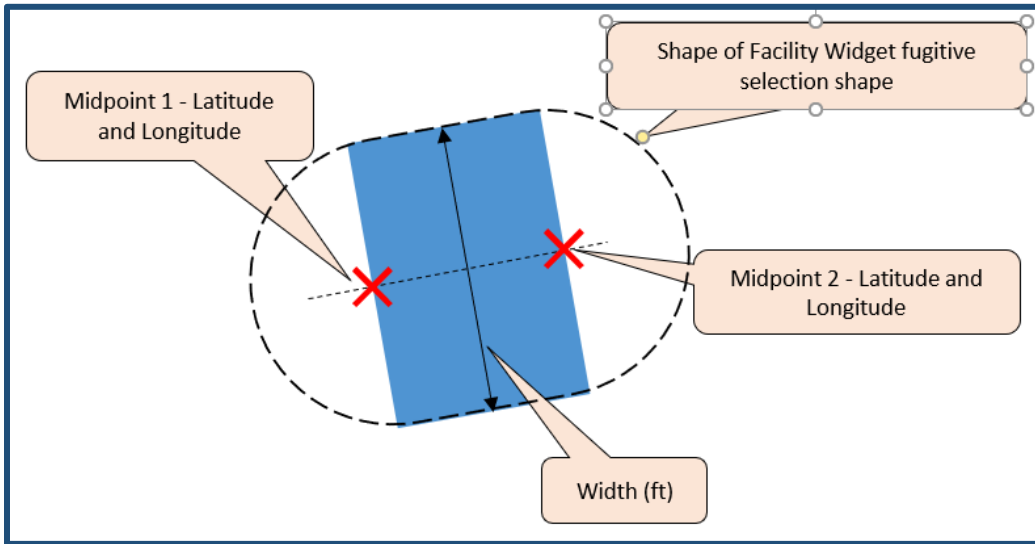


Figure 3: Example 2 of Fugitive Two-Dimensional Release



4.6 Fugitive Three-Dimensional Release Points

For fugitive three-dimensional release points, Table 11 provides a list of the fields and their definitions. This release point type assumes a square shape in the horizontal direction with a height. Unlike two-dimensional release points that emit only at a specific height, the emissions from three-dimensional release points are emitted across the entire height of the release point. Examples of this type of release point include an entire building with multiple release point on walls and/or roof and an outdoor storage pile. While the shape of a storage pile is unlikely to be a shape with a square base, users simply set the width and length so that the horizontal dimension represents as best as possible the actual shape and set the height to represent the height span of the release. If the release is not a square shape, the length and width must be set as best as possible to represent the actual shape of the source, since width and length are required to be the same.

Table 11: Release Point Data Fields for Fugitive Three-Dimensional Releases and Definitions

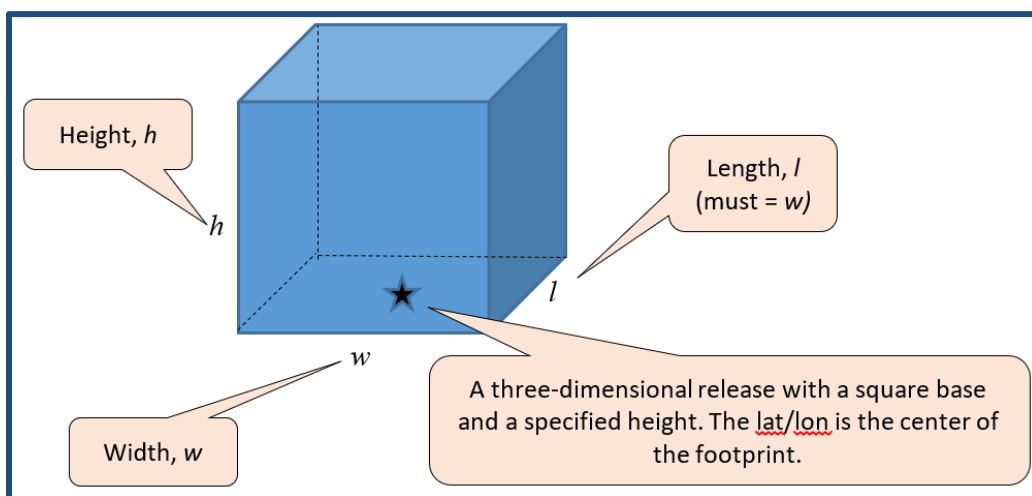
Facility Widget Label	Definition	EIS CDX Schema Field ^a
Height (Number 5,1)	The height from the ground <i>over</i> which the release occurs (measured in feet).	
Width (Number 6,1)	The width of the square fugitive three-dimensional release in feet. See also Figure 4.	
Length (Number 6,1)	The length of the square fugitive three-dimensional release in feet. <i>Even though the widget requires it to be entered manually, it must be equal to the width.</i> See also Figure 4.	
Latitude (Number 9,6)	The measure of the angular distance on a meridian north or south of the equator, assigned at <i>the center of square shape covering the area of the release.</i>	

Facility Widget Label	Definition	EIS CDX Schema Field ^a
Longitude (Number 10,6)	The measure of the angular distance on a meridian east or west of the prime meridian, assigned at <i>the center of square shape covering the area of the release.</i>	

^a As of February 2019, these fields do not map to the EIS because the EIS does not support this release point type.

When using the Facility Widget to define the width, length, height, and coordinates, the map allows users to drag the red “X”s to set the center of the release. The width is set using the data entry box provided, which changes both horizontal dimensions to create a square in the horizontal direction. The Facility Widget does not allow rotation of the square shape, so users should position the shape as best as possible over the fugitive three-dimensional release on the map. Figure 4 illustrates the relationship of the data entry fields provided in the Facility Widget with the actual shape of the release as it will be collected and included with inventory data.

Figure 4: Example of Fugitive Three-dimensional Release



4.7 Summary of release point parameters, including historical fugitive area releases Table 12 below summarizes the above information from Sections 4.3 through 4.6, and additionally includes the defaults and range checks that have been implemented in the Facility Widget for release point parameters. In the last column of Table 12, we also list an additional release point type called ‘Fugitive Area’, which is included only for historical purposes. Fugitive Area release points are defined by a width, length, southwest corner coordinates and an angle, but they are not supported by the Widget, by CEDRI, and may be removed from the Emissions Inventory System in the future.

Table 12: Summary of Release Parameters Needed for Each Fugitive Release Point Type, Constraints on Values, and Examples.

Release Parameters	Fugitive Release Point Types				
	Non-Fugitive (Stack) Releases	Fugitive Vent Releases	Fugitive Two-Dimensional Releases	Fugitive Three-Dimensional Releases	Fugitive Area – Historical Data Only
Release Height (ft)	Required Between 1-1,300 (Use 1 for ground-level)	Required > 0	Required > 0	Required > 0	Required Between 1-1,300
Stack Diameter (ft)	Required < release height and between 0.1 - 100	0.003 (Default)	NA	NA	NA
Exit Gas Velocity (ft/sec)	Required > 0	0.0003 (Default)	NA	NA	NA
Exit Gas Flow Rate (ft ³ /sec)	Calculated based on velocity and stack diameter assuming round stack	0 (Default)	NA	NA	NA
Exit Gas Temperature (°F)	Required ≤ 1,800	Required > 50	NA	NA	NA
Fugitive Length (ft)	NA	NA	NA	Required > 0 and = Width	Required >0
Fugitive Width (ft)	NA	NA	Required >0	Required >0	Required >0
Latitude, Longitude (decimal degrees)	Required	Required	Two sets of lat/long for the midpoints of ends of rectangle	Required, center of source footprint	Required, southwest corner of source
Examples	stack, powered building vent	Source area <10 ft ² Single roof vent/opening/window for building fugitives	Source area >10 ft ² Waste water holding pond, building with elongated roof vent, haul road	Entire building with multiple release point on walls and/or roof, outdoor storage pile	Waste water holding pond, building with elongated roof vent, haul road

5 Processes

Processes are ways in which units are operated at a facility to perform a function of the unit. Like units, processes have some input (such as fuel or raw materials) and some output (such as heat, power, a transformed material, or a chemical). In the environmental context, the process is the function at a unit that generates emissions or other environmentally impactful output. Sometimes processes include a description of a unit type and purpose as well as a fuel that is combusted, operations such as drying or grinding, or physical phenomenon such as evaporation or condensation. The list below provides some specific examples of processes that are relevant to air emissions:

- External Combustion Boilers; Electric Generation; Biomass Solids; Boiler, Stoker
- Chemical evaporation; Petroleum Product Storage at Refineries; Variable Vapor Space; Jet Kerosene: Filling Loss
- Waste Disposal; Solid Waste Disposal – Commercial; Sewage Sludge Incineration; Multiple Hearth Incinerator

Table 13 provides the process fields that are available in the Facility Widget, the definitions, and the EIS data fields to which they map.

Table 13: Process-Level Widget Data Fields, Definitions, and Associated EIS Data Field Names

Facility Widget Label	Definition	EIS CDX Schema Field ^a
Process ID	Internal FRS ID set by the FRS	
Alternative Process ID (Text 150)	The ID that a user provides for the process (or group of processes) that the user recognizes or is used in the originating data system. If a user wishes for their process data to be able to match other data submitted to the EPA (such as the National Emissions Inventory), then users may provide the process IDs assigned by their state, local, or tribal regulatory agency.	Emissions Process Identifier See also information provided below this table
SCC (Text 20)	EPA Source Classification Code (SCC) that identifies an emissions process and is associated with a process description. The examples of processes above are SCC descriptions.	Source Classification Code
Related Release Point (Text 20)	The FRS Release Point ID(s) for a release point or points associated with a given process.	Release Point Identifier
Process Allocation (Number 3)	The average percent of a process as it relates to one or more release points. Values from 1 to 100 are permitted. For example, 50 percent of emissions can flow to release point A while the other 50 percent can flow to release point B.	Average Percent Emissions

^a As of February 2019, these fields do not map to the EIS because the EIS does not support this release point type.

Many alternative unit IDs can exist for a given process. For air programs, primarily the different IDs come from state, local, and tribal air programs and from the EIS. In some cases, state, local, or tribal air agencies do not assign a process ID because of the design of their data system, but rather use the SCC as

the process ID. For the purposes of this document, there are two specific unit ID mappings that are useful to promoting data sharing.

When Widget users provide Alternative Process IDs for CEDRI, the two best options for those matching to the EIS are: (1) the Responsible Agency Process ID or (2) the EIS ID. Both IDs are available in the process-level data provided online by the NEI program; for example, the 2014 detailed NEI data for point sources are available from the “Data Summaries” tab on the [2014 NEI data page](#). As another option, state, local, or tribal air agencies can use the EIS to create “facility configuration reports” that include these IDs. These reports could be provided to industry users to facilitate data process-level mapping where desired.

In some cases, the level of detail included for processes differs depending on the data collection program. For example, a process record in a state data system (and therefore EIS) that appears to be a single process, could in fact be three separate processes in the real world. This can occur because processes may be aggregated by a state for permitting and/or emissions reporting purposes. The details of the three separate processes may be of interest to a program such as CEDRI, and in this case, mapping processes across programs is more difficult. To handle these types of cases, the FRS and CAER teams are working to consider how best to use “grouping” features of the FRS to support communication about process groups and other component groups.

6 Control Measures

Control measures are ways that emissions from processes at units are reduced. Control measures can be devices, practices, or process inputs that reduce emissions from what the emissions would be without the control measure in use. The list below provides some specific examples of control measures that are relevant to air emissions:

- High-efficiency particulate air filter (reduces particulate emissions)
- Dry scrubber (removes sulfur dioxide)
- Low solvent coatings (has lower volatile organic compounds than a higher solvent coating)
- Furnace sorbent injection (removes sulfur dioxide formed during coal combustion by injecting a sorbent such as calcium hydroxide or limestone into a furnace’s high temperature zone)
- Bottom filling (when filling tanks with a volatile liquid, bottom filling reduces the volatile emissions caused by opening the top of the tank and displacing the vapors with liquid)

Table 14 provides the control measure fields that are available in the Facility Widget, the definitions, and the EIS data fields to which they map. As of February 2019, the control measure approach in the EIS is being modified to be more useful and easier to use. It will align with the control measure approach in the FRS, which was designed with the EIS changes in mind.

Table 14: Control Measure Widget Data Fields, Definitions, and Associated EIS Data Field Names

Facility Widget Label	Definition	EIS CDX Schema Field ^a
Control Measure ID	Internal FRS ID set by the FRS	
Alternative Control Measure ID (Text 150)	The ID that a user provides for the control measure (or group of measures) that the user recognizes or is used in the originating data system.	
Capture Efficiency (Number 5,2)	An estimate of the portion of an affected emission stream that is collected and routed to the control measures when the capture or collection system is operating as designed, reported as a percent.	Percent Control Approach Capture Efficiency
Control Effectiveness (Number 5,2)	An estimate, reported as a percent, of the portion of the reporting periods activity for which the overall control system or approach (including both capture and control measures) were operating as designed (regardless of whether the control measure is due to a regulatory or is voluntary).	Percent Control Approach Effectiveness
Start Year (Number 4)	The first year that the control was operational	First Inventory Year
End Year (Number 4)	The last year that the control was operational	Last Inventory Year
Control Measure Type (Text 200)	Description of the Control Measure	Control Measure Code <i>Indirect:</i> See Section 6.1
Pollutant (Number 200)	The name of the pollutant that is controlled by the control measure.	Pollutant Code <i>Indirect:</i> See Section 6.2
Control Measure Reduction Efficiency (Number 5,2)	The percent reduction achieved for the pollutant when all control measures are operating as designed.	Percent Control Measures Reduction Efficiency
Number of Months Active Per Year (Text 2)	Number of months in the inventory year that the control operated as designed.	
Control Order (Text 3)	The numeric order in which the control measure is connected to the unit, process, and/or release point	
Series Parallel Indicator (Text 3)	If selected, indicates that the control measure is installed in parallel with the previous control measure listed in the Widget (in the Related Components section of the sub-facility edit window)	

6.1 Control Measure Type

Control measure types are coordinated between the Facility Widget and the EIS using a shared table of control measure type codes and descriptions. This is the list of control measure codes and descriptions displayed to users in the Facility Widget “Control Measure Type” drop-down menu on the Control Measure edit model window. This list of codes and descriptions can also be viewed from the EIS “Reporting Code Tables” page. For example, the control measure type code stored by the EIS is “141”

while the FRS stores the associated description “Wet Scrubber”. Ongoing work as part of E-Enterprise intends to make the control measure type codes list available via a web service, so that FRS, CEDRI, EIS, and other systems can share it.

6.2 Pollutants

Pollutant codes and names are coordinated between the Facility Widget and the EIS using a shared table of pollutant codes and descriptions. This is the list of pollutant codes and descriptions displayed to users in the Facility Widget “Pollutant” drop-down menu on the Control Measure edit modal window. This list of codes and descriptions can also be viewed from the EIS “Reporting Code Tables” page and as part of the Substance Registry Service (SRS). Examples of key pollutant codes and descriptions are provided in Table 15 below.

Table 15: Selected EIS Pollutants Available in the Facility Widget

EIS Pollutant Code	EIS Pollutant Description
CO	Carbon Monoxide
NOX	Nitrogen Oxides
VOC	Volatile Organic Compounds
SO2	Sulfur Dioxide
NH3	Ammonia
PM10-FIL	PM10 Filterable
PM10-PRI	PM10 Primary (Filt + Cond)
PM25-FIL	PM2.5 Filterable
PM25-PRI	PM2.5 Primary (Filt + Cond)
PM-CON	PM Condensable
7439921	Lead
74908	Hydrogen Cyanide
7647010	Hydrochloric Acid
7439976	Mercury
7440020	Nickel
18540299	Chromium (VI)
50000	Formaldehyde
71432	Benzene
106990	1,3-Butadiene
107028	Acrolein
75218	Ethylene Oxide

To create and download a full list of pollutant codes shared by the EIS and CEDRI, the best source is the EIS; however, the EIS is only available to EPA and state, local, and tribal users. Others should use the SRS website to get a list of valid pollutants. While this page has a way to download a list of SRS pollutants that are included in EIS, the list does not include the EIS Description that is used in the Widget (as of February 2019). In the available spreadsheet download, the “Substance Name” column or (most often) the “Registry Name” column may match the EIS name used by the Widget pollutant lookup.

For example, you may be interested in the pollutant named “p-Nitrophenol” for data entry to the Widget control measure screen. However, if you type “p-Nitrophenol” into the Widget pollutant search box, no pollutant will be available in the Widget with that name. In EIS, this pollutant is called “4-Nitrophenol,” but if you do not know that, then you would need to take other steps to figure out the EIS pollutant name.

To find the EIS pollutant name for a pollutant not found by the Widget, take the following steps to find the EIS synonym:

1. From the main [SRS website](#), use the first search field called “Find chemicals or substances”
2. Select the “By list” link shown above the search box
3. Under the blue “Search” button, fill in “EIS” where the box reads “Filter all columns” and a row with the EIS listed should be displayed
4. Select the check box next to “Emissions Inventory System”
5. Enter the name of the pollutant you wish to search for in the box “Enter a name or number” (e.g., enter p-Nitrophenol or CAS number 100-02-7)
6. Click the blue Search button
7. If the pollutant is found, the search will return a row with responses, and the “Substance Name” column will have a hyperlink. [Click on that hyperlink.](#)
8. Scroll down to the second table on the screen labeled “EPA Applications/Systems”, and in that table, you will find a row for EIS. The value next to EIS for the pollutant “Synonym” is the name that will appear in the Widget control table.

The CAER and FRS teams are working to eliminate this complex procedure for finding EIS pollutant descriptions for use of the Widget for control measure data entry.