Appendix D – Database Structure

The main elements of the database structure are presented in the table below. Some of the tables that are not contained in the description below store general information, such as the average annual wind speed at the site.

Figure 1.1 provides an overview of the table relationships of the central database structure.

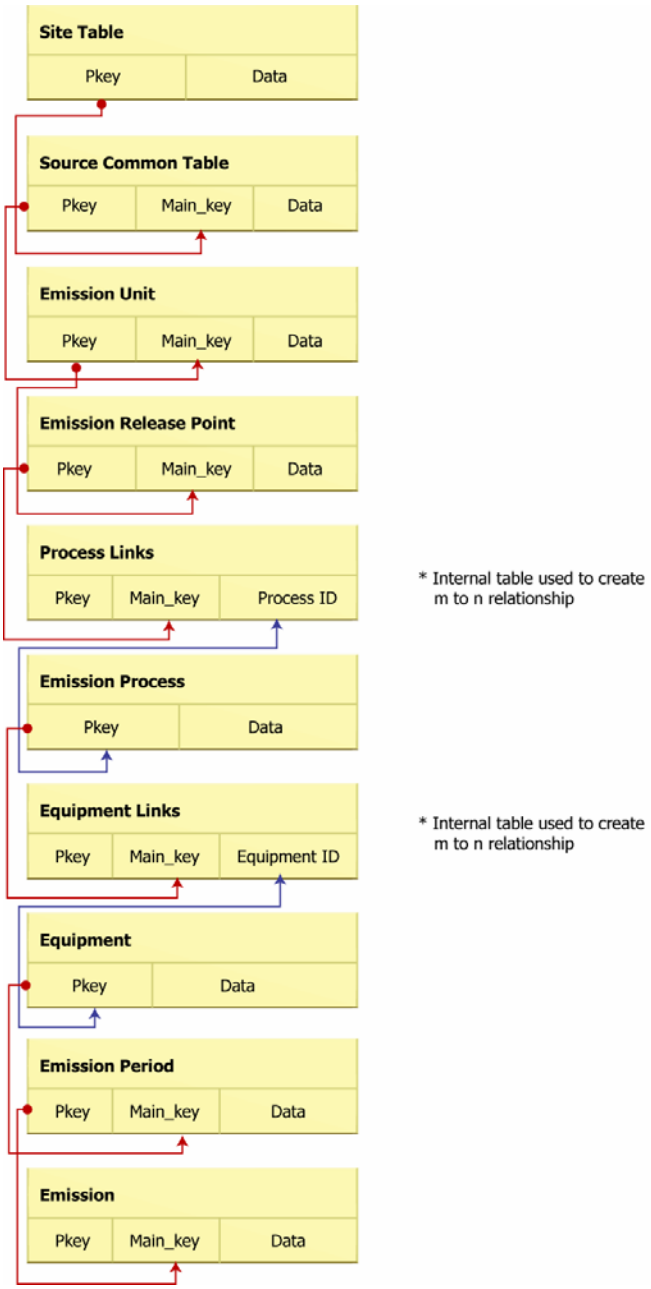

Figure 1.1 – Relationship overview of the central database structure of TEISS View.

Short indications:

* - key field;
Types of fields in tables:
A - String;
I - integer;
S – Short Integer;
N - Float;
D – Date
B – Boolean (CHAR(1)) = “T” (True) or “F” (False).
† – NIF Data Field

D.1. REFERENCE TABLES.

Table D1.1. StateFIP. Table contains list of USA sates.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	StateID	I *	The FIPS Code for the State.
3.	ST_ABBR	A [2]	The abbreviator for the State.
4.	State_Proper	A [80]	Name of the State

Table D1.2. Address. Table contains address type code.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Address type code
3.	TYPE_DESC	A [80]	Description

Table D1.3. Contact. Table contains contact type code.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Contact type code
3.	TYPE_DESC	A [80]	Description

Table D1.4. County. Table contains county information.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	StateID	I *	Link to the state table **StateFIP** (StateID)
3.	FIPSCNTY	A [5]	County code
4.	County_Name	A [80]	County name
5.	LATITUDE	N	Latitude of the county
6.	LONGITUDE	N	Longitude of the county
7.	UTMEAST	N	UTM East
8.	UTMNORTH	N	UTM North
9.	UTMZONE	I	UTM Zone
10.	EPARegion	I	EPA Region

Table D1.5. ControlDevice. Table contains control device codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [5]	Control device code

3.	TYPE_DESC	A [80]	Description

Table D1.6. EmissCalcMethod. Table contains list of emission calculation methods.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Emission calculation method code
3.	TYPE_DESC	A [80]	Description

Table D1.7. EmissRelPoint. Table contains emission release point type.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Type code
3.	TYPE_DESC	A [80]	Description

Table D1.8. EmissType. Table contains emission types.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Type code
3.	TYPE_DESC	A [80]	Description

Table D1.9. FacilityType. Table contains facility types.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Type code
3.	TYPE_DESC	A [80]	Description

Table D1.10. InventoryType. Table contains inventory types.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [10]	Inventory type code
3.	TYPE_DESC	A [200]	Type description

Table D1.11. MACTType. Table contains MACT codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [10]	Type code
3.	TYPE_DESC	A [200]	Type description

Table D1.12. MACTCompl. Table contains MACT compliance status.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Type code
3.	TYPE_DESC	A [200]	Type description

Table D1.13. Material. Table contains material codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	I	Type code
3.	TYPE_DESC	A [80]	Type description

Table D1.14. MaterialIO. Table contains material I/O codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.

2.	TYPE_CODE	A [5]	Type code
3.	TYPE_DESC	A [80]	Type description

Table 1.15. NAICS. Table contains NAICS codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [6]	Type code
3.	TYPE_DESC	A [200]	Type description

Table 1.16. Pollutant. Table contains pollutant codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [10]	Type code
3.	TYPE_DESC	A [80]	Type description

Table 1.17. Reliability. Table contains reliability indicators codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [1]	Type code
3.	TYPE_DESC	A [80]	Type description

Table D1.18. RuleEffect. Table contains rule effect codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [2]	Type code
3.	TYPE_DESC	A [80]	Type description

Table D1.19. SIC. Table contains SIC codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [4]	Type code
3.	TYPE_DESC	A [300]	Type description

Table D1.20. SourceType. Table contains source type codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [20]	Type code
3.	TYPE_DESC	A [80]	Type description

Table D1.21. TransType. Table contains transaction type codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [20]	Type code
3.	TYPE_DESC	A [80]	Type description

Table D1.22. UnitType. Table contains units of physical measurement.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	MEAS_CATEGORY	A [20]	Unit measurement category
3.	TYPE_CODE	A [15]	Unit code
4.	TYPE_DESC	A [80]	Unit description
5.	CONVERSION_FACTOR	N	Conversion factor
6.	STND_UNIT	A [10]	Standard unit abbreviation

Table D1.23. XYCoordType. Table contains XY coordinate type codes.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [10]	Type code
3.	TYPE_DESC	A [80]	Type description

Table 1.24. SCC_Point. Table contains SCC codes for point sources.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [10]	SCC code
3.	SCC1_DESC	A [200]	Type description SCC 1
4.	SCC3_DESC	A [200]	Type description SCC 3
5.	SCC6_DESC	A [200]	Type description SCC 6
6.	SCC8_DESC	A [200]	Type description SCC 8
7.	MEASURE	A [100]	Measure Unit
8.	MATERIAL	A [100]	Material
9.	ACTION	A [100]	Action (Burned, Travelled, Output etc.)

Table D1.25. SCC_Area. Table contains SCC codes for area sources.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [10]	SCC code
3.	SCC1_DESC	A [200]	Type description SCC 1
4.	SCC3_DESC	A [200]	Type description SCC 3
5.	SCC6_DESC	A [200]	Type description SCC 6
6.	SCC8_DESC	A [200]	Type description SCC 8
7.	MEASURE	A [100]	Measure Unit
8.	MATERIAL	A [100]	Material
9.	ACTION	A [100]	Action (Burned, Travelled, Output etc.)

Table D1.26. SCC_Mobile. Table contains SCC codes for mobile sources.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	TYPE_CODE	A [10]	SCC code
3.	SCC1_DESC	A [200]	Type description SCC 1
4.	SCC3_DESC	A [200]	Type description SCC 3
5.	SCC6_DESC	A [200]	Type description SCC 6
6.	SCC8_DESC	A [200]	Type description SCC 8
7.	MEASURE	A [100]	Measure Unit
8.	MATERIAL	A [100]	Material
9.	ACTION	A [100]	Action (Burned, Travelled, Output etc.)

D.2. Project Tables

Table D2.1. pntSite. The main table contains list of sites (it contains **Transmittal** and **Site** records).

	Field name	Field type	Destination
Transmittal Table			
1.	Pkey	+ [*]	Primary unique index of table.
2.	DataLevel	I	The level of disaggregation of the emission record.

			1 - SITE, 2 - UNIT, 3 - STACK, 4 - PROCESS. Export NIF as **strEmissionDataLevel** (A [10])
3.	StateID †	I *	Link to the state table **StateFIP.** Export NIF as **strStateFIPs** (A [2])
4.	CountyID †	I *	Link to the county table **County.** Export NIF as **strCountyFIPs** (A [3])
5.	StrOrganizationName †	A [40]	Name of organization submitting the dataset.
6.	TransactionID †	I *	Link to the transaction table **TransType.** Export NIF as **strTransactionType** (A [2])
7.	IntInventoryYear †	I	Year of inventory data in dataset.
8.	InventoryID †	I *	Link to inventory table **InventoryType** (TYPE_CODE). Export NIF as **strInventoryTypeCode** (I [8])
9.	TransactionDate †	D	Creation date of transmittal data. (Format: YYYYMMDD). Export NIF as **LngTransactionCreationDate** (A [10])
10.	IntIncrementalSubmissionNumber †	I	A unique report number that differentiates this submission from others. The initial number is 1 and it is incremented by 1 for every submission
11.	SngReliabilityIndicator †	N	DARS Numeric (composite) score for overall inventory.
12.	StrTransactionComments †	A [80]	General comments regarding transmittal.
13.	StrContactPersonName †	A [30]	Lead contact for organization transmitting dataset.
14.	StrContactPhoneNumber †	A [15]	The phone number for the contact name.
15.	StrContactFaxNumber †	A [15]	The fax number for the contact name.
16.	StrContactEmailAddress †	A [30]	The email address for the inventory contact.
17.	StrContactAlternatePhoneNumber †	A [15]	The alternate phone number for the inventory contact.
18.	SourceTypeID †	I *	Link to source types table **SourceType** (TYPE_CODE). Export NIF as **strSourceType** (A [25])
19.	ContactTypeID †	I *	Indicates the contact type ie. Reporting, Preparer etc. Link to contact types table **Contact** (TYPE_CODE). Export NIF as **StrContactTypeCode** (A[2])
20.	SngFormatVersion †	N	Indicates the NEI Input Format version number of the dataset.
Site Table			
21.	StrSiteID †	A [15]	Unique state/ local/ tribal ID reported consistently over time.
22.	StrFederalFacilityID †	A [12]	Unique Federal ID number assigned to a Facility.

23.	FacilityCategoryID †	I *	Indicates if HAP emitting facility is MAJOR or AREA. Link to table **FacilityType** (TYPE_CODE). Export NIF as **strFacilityCategry** (A[2])
24.	StrORISFacilityCode †	A [6]	Unique identifier for electric generating units.
25.	SICID †	I *	Standard Industrial Classification code system. Link to table **SIC** (TYPE_CODE). Export NIF as **strSICPrimary** (A[4])
26.	NAICSID †	I *	North American Industry Classification code. Link to table **NAICS** (TYPE_CODE). Export NIF as **strNAICSPrimary** (A[6])
27.	StrFacilityName †	A [50]	The name of the facility.
28.	StrSiteDescription †	A [40]	Any comments/description for site/facility.
29.	StrStreetLine1 †	A [30]	Line 1 of the address
30.	StrStreetLine2 †	A [30]	Line 2 of the address
31.	StrStreetLine3 †	A [30]	Line 3 of the address
32.	StrCity †	A [30]	The name of the city.
33.	StrZipCode †	A [10]	The U.S. Postal Service zip code.
34.	FacilityStateID †	I *	Link to the state table **StateFIP** (ST_ABBR). Export NIF as **strState** (A[2])
35.	StrCountry †	A [20]	The country name.
36.	AddresTypeID †	I *	Indicates Physical, Mailing or Parent Company address. Link to address type table **Address.** Export NIF as **strAddressTypeCode** (A [2])
37.	PollutantType	I	1 - Criteria Pollutants 2 - Hazardous Air Pollutants - HAPS (Toxics) 3 - Criteria Pollutants & HAPS
38.	StrNTISiteID †	A [20]	ID for the facility in the 1996 NTI.
39.	MACTTypeID †	I *	MACT code for the entire facility. Link to table **MACTType** (TYPE_CODE). Export NIF as **strSiteMACTCode** (A[6])
40.	MACTComplID †	I *	Major/Area classification and status under CAAA Sections 112&129. Link to **MACTCompl** (TYPE_CODE). Export NIF as **strSiteMACTComplianceStatus** (A [6])
41.	StrDunBradstreetNumber	A [10]	Dun & Bradstreet no. for the facility. Export NIF as **strDun&BradstreetNumber** (A [10])
42.	StrTRIID	A [20]	Toxic Release Inventory (TRI) ID for facility.
43.	StrSubmittalFlag	A [4]	Submittal status of record.

Table D2.1a. SrcCommon. Table contains list of sources and their types.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the site table **pntSite**

3.	SrcType	I *	Source Type. 1: POINT; 2: AREA; 3: BIOGENIC; 4: ON-ROAD MOBILE.

Table 2.2. pntEmissUnit. Table contains emission units list for specified site.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the site table **SrcCommon**
3.	StrEmissionUnitID †	A [6]	Unique state/ local/ tribal ID reported consistently over time.
4.	StrORISBoilerID †	A [5]	DOE code for electric utility boiler units
5.	SICID †	I *	Standard Industrial Classification code system. Link to SIC codes table **SIC** (TYPE_CODE). Export NIF as **strSICUnivLevel** (A[4])
6.	NAICSID †	I *	North American Industry Classification code. Link to table **NAICS** (TYPE_CODE). Export NIF as **strNAICSUnitLevel** (A[6])
7.	SngDesignCapacity †	N	Numeric value of average operational capacity for an Emission Unit.
8.	CapacityUnitNum †	I *	The units of capacity for an Emission Unit (ie., MW, KW,lbs/hr). Link to table **UnitType** (TYPE_CODE). Export NIF as **strDesignCapacityUnitNumerator** (A[10)
9.	CapacityUnitDeNum †	I *	The units of capacity for an Emission Unit (ie., MW, KW,lbs/hr). Link to table **UnitType** (TYPE_CODE). Export NIF as **strDesignCapacityUnitNumerator** (A[10)
10.	SngMaxNameplateCapacity †	N	Numeric value of rated design capacity at 100% (max) operation. Report value in same unit of measure as for DESIGN CAPACITY.
11.	StrEmissionUnitDescription †	A [80]	Emission unit description
12.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table D2.3. pntEmissRelease. Table contains Emission Release Points.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the site table **pntEmissUnit**
3.	StrEmissionReleasePointID †	A [6]	State/ local/ tribal ID for point / location where emissions are released to ambient air.
4.	EmissTypeID †	I *	The code for physical configuration of the release point. Link to table **EmissRelPoint** (TYPE_CODE). Export NIF as **strEmissionReleasePointType** (A[2])
5.	IsStack †	B	Stack (TRUE) or Non-Stack

6.	SngStackHeight †	N	The height (in feet) of a stack.
7.	SngStackDiameter †	N	The diameter (in feet) of a stack.
8.	SngStackFencelineDistance †	N	Numeric value for stack to fenceline distance (in feet).
9.	SngExitGasTemperature †	N	The temperature of an exit gas stream (degree Fahrenheit).
10.	SngExitGasVelocity †	N	The velocity of an exit gas stream (feet per second).
11.	SngExitGasFlowRate †	N	Numeric value of stack gas flow rate in (actual cubic feet per second).
12.	Longitude †	N	Longitude (+/-)ddd.dddddd Export NIF as **sngXCoordinate** (N[11] if XYCoordType is Lat/Long)
13.	Latitude †	N	Latitude (+/-)dd.dddddd Export NIF as **sngYCoordinate** (N[10] if XYCoordType is Lat/Long)
14.	Coord_X †	N	UTM Easting (kilometers). Export NIF as **sngXCoordinate** (N[11] if XYCoordType is UTM)
15.	Coord_Y †	N	UTM Northing (kilometers). Export NIF as **sngYCoordinate** (N[10] if XYCoordType is Lat/Long)
16.	IntUTMZone †	I	Zone no. in UTM coordinate system.
17.	CoordTypeID †	I *	Type of Coordinate system used, e.g., UTM or LAT/LON. Link to table **XYCoordType** (TYPE_CODE). Export NIF as **strXYCoordinateType** (A[8])
18.	LngHorizontalAreaFugitive †	I	Horizontal area of fugitive emissions.
19.	LngReleaseHeightFugitive †	I	Release height (above terrain) of fugitive emissions.
20.	FugitiveDimensionsUnit †	I *	Horizontal area and release height dimensions are same. Link to table **UnitType** (TYPE_CODE). Export NIF as **strFugitiveDimensionsUnit** (A[10])
21.	StrEmissionsReleasePTDesc †	A [80]	Description. Export NIF as **strEmissionsReleasePTDescription** (A[80])
22.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table D2.4. pntProcessLink. Table contains links between emission release point and emission process. The table performs M to N relationship.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **pntEmissRelease**
3.	ProcessID	I *	Primary key from emission process table **pntEmissProcess**

Table D2.5. pntEmissProcess. Table contains emission process list for specified emission release point.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	StrProcessID †	A [6]	Unique state/ local/ tribal ID reported consistently over time.

3.	SCCTypeID †	A [10]	EPA Source Category Code for Point Sources. Link to table **SCC_Point** (TYPE_CODE). Export NIF as **strSCC** (A[10).
4.	MACTTypeID †	I *	Maximum Achievable Control Technology for HAP regulated sources. Link to table **MACTType** (TYPE_CODE). Export NIF as **strProcessMACTCode** (A[6])
5.	StrEmissionProcessDescripton †	A [78]	A text description of the Emission Process.
6.	SngWinterThroughputPCT †	N	The percentage a process operates during the winter months.
7.	SngSpringThroughputPCT †	N	The percentage a process operates during the spring months.
8.	SngSummerThroughputPCT †	N	The percentage a process operates during the summer months.
9.	SngFallThroughputPCT †	N	The percentage a process operates during the fall months.
10.	IntAnnualAvgDaysPerWeek †	I	Average number of days per week an emission process is active within year.
11.	IntAnnualAvgWeeksPerYear †	I	Average number of weeks per year an emission process is active.
12.	IntAnnualAvgHoursPerDay †	I	Average number of hours per day an emission process is active within year.
13.	IntAnnualAvgHoursPerYear †	I	Average number of hours per year an emission process is active.
14.	SngHeatContent †	N	The heat content of a fuel in million BTU's per SCC unit.
15.	SngSulfurContent †	N	The sulfur content of a fuel (mass percent).
16.	SngAshContent †	N	The ash content of a fuel (mass percent).
17.	MACTComplTypeID †	I *	Major/Area classification and status under CAAA Sections 112&129. Link to table **MACTCompl** (TYPE_CODE). Export NIF as **strProcessMACTComplianceStatus** (A[6])
18.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table D2.6. pntEquipLink. Table contains equipment links list for specified emission process.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **pntEmissProcess**
3.	EquipmentID	I *	Primary key from equipment table **pntEquipment**

Table D2.7. pntEquipment. Table contains equipment list for specified emission process.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	PollutantTypeID †	I *	Pollutant Code. Link to the table **Pollutant** (TYPE_CODE). Export NIF

			as **strPollutantID** (A[10])
3.	SngPrimaryPCTCtrlEfficiency †	N	The percent effectiveness of primary control device. Export NIF as **sngPrimaryPCTControlEfficiency** (N[5])
4.	SngPCTCaptureEfficiency	N	Numeric value for percentage capture efficiency of system.
5.	SngSecondaryEfficiency	N	The percent effectiveness of secondary control device.
6.	SngThirdEfficiency	N	The percent effectiveness of third control device.
7.	SngFourthEfficiency	N	The percent effectiveness of fourth control device.
8.	SngTotalCaptureCtrlEfficiency †	N	Collective (aggregate) value for all controls. Export NIF as **sngTotalCaptureCtrlEfficiency** (N[5])
9.	PrimaryDeviceTypeID †	I *	The primary type of control equipment used. Link to the table **ControlDevice** (TYPE_CODE). Export NIF as **strPrimaryDeviceTypeCode** (A[4])
10.	SecondaryDeviceTypeID †	I *	Secondary control device type. Link to the table **ControlDevice** (TYPE_CODE). Export NIF as **strSecondaryDeviceTypeCode** (A[4]).
11.	StrControlSystemDescription †	A [40]	Description of control equipment chain.
12.	ThirdDeviceTypeID †	I *	Third control device type. Link to the table **ControlDevice** (TYPE_CODE). Export NIF as **strThirdControlDeviceTypeControl** (A[4])
13.	FourthDeviceTypeID †	I *	Fourth control device type. Link to the table **ControlDevice** (TYPE_CODE). Export NIF as **strFourthControlDeviceTypeControl** (A[4])
14.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table D2.8. pntEmissPeriod. Table contains emission period list for specified equipment.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **pntEquipment**
3.	StartDate †	D	Start date and time of the period in which reported emissions occur. Export NIF as two fields (**lngStartDate** and **intStartTime**)
4.	EndDate †	D	End date and time of the period in which reported emissions occur. Export NIF as two fields (**lngEndDate** and **intEndTime**)
5.	SngActualThroughput †	N	Numeric value of process activity.
6.	ThroughputUnitID †	I *	Throughput unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strThroughputUnitNumerator** (A[10])

7.	MaterialID †	I *	Material code for material processed. Link to the table **Material** (TYPE_CODE). Export NIF as **intMaterial** (I)
8.	MaterialIOID †	I *	A descriptor indicating whether material is used or produced. Link to the table **MaterialIO** (TYPE_CODE). Export NIF as **strMaterialIO** (A[10]).
9.	IntPeriodDaysPerWeek †	I	Avg no. days/wk the process is active within activity time period specified.
10.	IntPeriodWeeksPerPeriod †	I	Avg no. wks/yperiod the process is active within activity time period specified.
11.	IntPeriodHoursPerDay †	I	Avg no. hrs/day the process is active within activity time period specified.
12.	IntPeriodHoursPerPeriod †	I	Avg no. hrs/period the process is active within activity time period specified.
13.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table D2.9. pntEmission. Table contains emission list for specified emission period.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **pntEmissPeriod**
3.	PollutantTypeID †	I *	Pollutant Code. Link to the table **Pollutant** (TYPE_CODE). Export NIF as **strPollutantCode** (A[10])
4.	StartDate †	D	Start date and time of the period in which reported emissions occur. Export NIF as two fields (**lngStartDate** and **intStartTime**)
5.	EndDate †	D	End date and time of the period in which reported emissions occur. Export NIF as two fields (**lngEndDate** and **intEndTime**)
6.	DblEmissionNumericValue †	N	Numeric value of emission
7.	EmissionUnitID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strEmissionUnitNumerator** (A[10])
8.	EmissionTypeID †	I *	Emission type code, i.e., Entire Period, Average Weekday, etc. Link to the table **EmissType** (TYPE_CODE). Export NIF as **strEmissionType** (A[2])
9.	SngEMReliabilityIndicator †	N	DARS Numeric (composite) score for SCC level emissions.
10.	SngFactorNumericValue †	N	The numeric value of the emission factor.
11.	FactorUnitNomID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strFactorUnitNumerator** (A[10])
12.	FactorUnitDenomID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strFactorUnitDenominator** (A[10])
13.	EmissCalcMethodID †	I *	Method used to derive emissions. Link to the table **EmissCalcMethod**

			(TYPE_CODE). Export NIF as **strEmission Calculation Method Code** (A[2])
14.	EFReliabilityID †	I *	A reliability indicator code for emission factor rating. Link to the table **Reliability** (TYPE_CODE). Export NIF as **strEFReliabilityIndicator** (A[5]).
15.	SngRuleEffectivenss †	N	Measure of the percent effectiveness of the control strategy.
16.	RuleEffectMethodID †	I *	The code identifying the rule effectiveness method. Link to the table **RuleEffect** (TYPE_CODE). Export NIF as **strRuleEffectivenessMethod** (A[2])
17.	SngRulePenetration †	N	Percent applicability of the rule to the source category.
18.	ControlStatus †	B	Indicates if reported emissions are controlled or uncontrolled. TRUE – "CONTROLLED" FALSE – "UNCONTROLLED" Export NIF as **strControlStatus** (A[12]).
19.	StrSubmittalFlag †	A [4]	Submittal status of record.

D.3. Area and Nonroad Mobile Sources Tables

Note that for this type of source no Site table is required.

Table 3.1. areaEmissProcess. Table contains emission process list for area sources.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the site table **SrcCommon**
3.	SCCTypeID †	A [10]	EPA Source Category Code for Area and Nonroad Mobile Sources. Link to table **SCC_Area** (TYPE_CODE). Export NIF as **strSCC** (A[10]).
4.	MACTTypeID †	I *	Maximum Achievable Control Technology for HAP regulated sources. Link to table **MACTType** (TYPE_CODE). Export NIF as **strProcessMACTCode** (A[6]).
5.	StrEmissionProcessDescripton †	A [78]	A text description of the Emission Process.
6.	SICID †	I *	Standard Industrial Classification code system. Link to table **SIC** (TYPE_CODE). Export NIF as **strSIC** (A[4]).
7.	NAICSID †	I *	North American Industry Classification code. Link to table **NAICS** (TYPE_CODE). Export NIF as **strNAICS** (A[6]).
8.	SngWinterThroughputPCT †	N	The percentage a process operates during the winter months.
9.	SngSpringThroughputPCT †	N	The percentage a process operates

			during the spring months.
10.	SngSummerThroughputPCT †	N	The percentage a process operates during the summer months.
11.	SngFallThroughputPCT †	N	The percentage a process operates during the fall months.
12.	IntAnnualAvgDaysPerWeek †	I	Average number of days per week an emission process is active within year.
13.	IntAnnualAvgWeeksPerYear †	I	Average number of weeks per year an emission process is active.
14.	IntAnnualAvgHoursPerDay †	I	Average number of hours per day an emission process is active within year.
15.	IntAnnualAvgHoursPerYear †	I	Average number of hours per year an emission process is active.
16.	SngHeatContent †	N	The heat content of a fuel in million BTU's per SCC unit.
17.	SngSulfurContent †	N	The sulfur content of a fuel (mass percent).
18.	SngAshContent †	N	The ash content of a fuel (mass percent).
19.	MACTComplTypeID †	I *	Major/Area classification and status under CAAA Sections 112&129. Link to table **MACTCompl** (TYPE_CODE). Export NIF as **strProcessMACTComplianceStatus** (A[6]).
20.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table 3.2. areaEquipment. Table contains equipment list for specified emission process.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the site table **areaEmissProcess**
3.	PollutantTypeID †	I *	Pollutant Code. Link to the table **Pollutant** (TYPE_CODE). Export NIF as **strPollutantCode** (A[10]).
4.	SngPrimaryPCTCtrlEfficiency †	N	The percent effectiveness of primary control device. Export NIF as **sngPrimaryPCTControlEfficiency**
5.	SngPCTCaptureEfficiency †	N	Numeric value for percentage capture efficiency of system.
6.	SngSecondaryEfficiency †	N	The percent effectiveness of secondary control device.
7.	SngTotalCaptureCtrlEfficiency †	N	Collective (aggregate) value for all controls. Export NIF as **sngTotalCaptureControlEfficiency**
8.	PrimaryDeviceTypeID †	I *	The primary type of control equipment used. Link to the table **ControlDevice** (TYPE_CODE). Export NIF as **strPrimaryDeviceType** (A[4])
9.	SecondaryDeviceTypeID †	I *	Secondary control device type. Link to the table **ControlDevice** (TYPE_CODE). Export NIF as **strSecondaryDeviceType** (A[4])

10.	StrControlSystemDescription †	A [40]	Description of control equipment chain.
11.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table 3.3. areaEmissPeriod. Table contains emission period list for specified equipment.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **areaEquipment**
3.	StartDate †	D	Start date and time of the period in which reported emissions occur. Export NIF as two fields (**lngStartDate** and **intStartTime**)
4.	EndDate †	D	End date and time of the period in which reported emissions occur. Export NIF as two fields (**lngEndDate** and **intEndTime**)
5.	SngActualThroughput †	N	Numeric value of process activity.
6.	ThroughputUnitID †	I *	Throughput unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strThroughputUnitNumerator** (A[10])
7.	MaterialID †	I *	Material code for material processed. Link to the table **Material** (TYPE_CODE). Export NIF as **intMaterial** (I)
8.	MaterialIOID †	I *	A descriptor indicating whether material is used or produced. Link to the table **MaterialIO** (TYPE_CODE). Export NIF as **strMaterialIO** (A[10])
9.	IntPeriodDaysPerWeek †	I	Avg no. days/wk the process is active within activity time period specified.
10.	IntPeriodWeeksPerPeriod †	I	Avg no. wks/yperiod the process is active within activity time period specified.
11.	IntPeriodHoursPerDay †	I	Avg no. hrs/day the process is active within activity time period specified.
12.	IntPeriodHoursPerPeriod †	I	Avg no. hrs/period the process is active within activity time period specified.
13.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table 3.4. areaEmission. Table contains emission list for specified emission period.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **areaEmissPeriod**
3.	PollutantTypeID †	I *	Pollutant Code. Link to the table **Pollutant** (TYPE_CODE). Export NIF as **strPollutantCode** (A[10]).
4.	StartDate †	D	Start date and time of the period in which reported emissions occur. Export NIF as two fields (**lngStartDate** and **intStartTime**)
5.	EndDate †	D	End date and time of the period in which reported emissions occur. Export NIF as two fields (**lngEndDate** and **intEndTime**)

6.	DblEmissionNumericValue †	N	Numeric value of emission
7.	EmissionUnitID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strEmissionUnitNumerator** (A[10])
8.	EmissionTypeID †	I *	Emission type code, i.e., Entire Period, Average Weekday, etc. Link to the table **EmissType** (TYPE_CODE). Export NIF as **strEmissionType** (A[2])
9.	SngEMReliabilityIndicator †	N	DARS Numeric (composite) score for SCC level emissions.
10.	SngFactorNumericValue †	N	The numeric value of the emission factor.
11.	FactorUnitNomID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strFactorUnitNumerator** (A[10])
12.	FactorUnitDenomID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strFactorUnitDenominator** (A[10])
13.	EmissCalcMethodID †	I *	Method used to derive emissions. Link to the table **EmissCalcMethod** (TYPE_CODE). Export NIF as **strEmissionCalculationMethodCode** (A[2])
14.	EFReliabilityID †	I *	A reliability indicator code for emission factor rating. Link to the table **Reliability** (TYPE_CODE). Export NIF as **strEFReliabilityIndicator** (A[5])
15.	SngRuleEffectivenss †	N	Measure of the percent effectiveness of the control strategy.
16.	RuleEffectMethodID †	I *	The code identifying the rule effectiveness method. Link to the table **RuleEffect** (TYPE_CODE). Export NIF as **strRuleEffectivenessMethod** (A[2])
17.	SngRulePenetration †	N	Percent applicability of the rule to the source category.
18.	StrSubmittalFlag †	A [4]	Submittal status of record.

D.4. On-Road Mobile Source Tables

Note that for this type of source no *Site Table* is required.

Table 4.1. moblEmissPeriod. Table contains emission period list for mobile sources.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **SrcCommon**
3.	SCCTypeID †	A [10]	EPA Source Category Code for On-Road Mobile Sources. Link to table **SCC_Mobile** (TYPE_CODE). Export NIF as **strSCC** (A[10]).
4.	StartDate †	D	Start date and time of the period in which reported emissions occur. Export

			NIF as two fields (**lngStartDate** and **intStartTime**)
5.	EndDate †	D	End date and time of the period in which reported emissions occur. Export NIF as two fields (**lngEndDate** and **intEndTime**)
6.	SngActualThroughput †	N	Numeric value of process activity.
7.	ThroughputUnitID †	I *	Throughput unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strThroughputUnitNumerator** (A[10])
8.	StrSubmittalFlag †	A [4]	Submittal status of record.

Table 4.2. moblEmission. Table contains emission list for specified emission period.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **moblEmissPeriod**
3.	PollutantTypeID †	I *	Pollutant Code. Link to the table **Pollutant** (TYPE_CODE). Export NIF as **strPollutantCode** (A[10]).
4.	StartDate †	D	Start date and time of the period in which reported emissions occur. Export NIF as two fields (**lngStartDate** and **intStartTime**)
5.	EndDate †	D	End date and time of the period in which reported emissions occur. Export NIF as two fields (**lngEndDate** and **intEndTime**)
6.	StrEmissionProcessDescripton †	A [80]	A text description of the Emission Process.
7.	DblEmissionNumericValue †	N	Numeric value of emission
8.	EmissionUnitID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strEmissionUnitNumerator** (A[10])
9.	EmissionTypeID †	I *	Emission type code, i.e., Entire Period, Average Weekday, etc. Link to the table **EmissType** (TYPE_CODE). Export NIF as **strEmissionType** (A[2])
10.	SngEMReliabilityIndicator †	N	DARS Numeric (composite) score for SCC level emissions.
11.	StrSubmittalFlag †	A [4]	Submittal status of record.

D.5. Biogenic Sources Table

For this type of source only the *Transmittal Table* and *Emissions Table* are required for NIF.

Table 5.1. bioEmission. Table contains emission list for area sources.

	Field name	Field type	Destination
1.	Pkey	+ [*]	Primary unique index of table.
2.	Main_Key	I *	Link to the table **SrcCommon**
3.	PollutantTypeID †	I *	Pollutant Code. Link to the table **Pollutant** (TYPE_CODE). Export NIF as **strPollutantCode** (A[10]).
4.	StrEmissionProcessDescripton†	A [80]	A text description of the Emission

			Process.
5.	DblEmissionNumericValue †	N	Numeric value of emission
6.	EmissionUnitID †	I *	Unit of measure. Link to the table **UnitType** (TYPE_CODE). Export NIF as **strEmissionUnitNumerator** (A[10])
7.	EmissionTypeID †	I *	Emission type code, i.e., Entire Period, Average Weekday, etc. Link to the table **EmissType** (TYPE_CODE). Export NIF as **strEmissionType** (A[2])
8.	SngEMReliabilityIndicator †	N	DARS Numeric (composite) score for SCC level emissions.
9.	StrSubmittalFlag †	A [4]	Submittal status of record.

Appendix E – Area Emissions Inventory Data Sources

This appendix contains some information on obtaining area source emissions data. This is in a stage of ongoing development with ITEP to give guidance on data origin.

Area sources represent the emissions from:

1. Sources that emit to the atmosphere over a physical area. Examples of true area sources are impoundment lagoons and landfills.
2. Sources that are too numerous and dispersed to efficiently include in a point source inventory. Traditional examples of dispersed area sources include gasoline service stations, small print shops, and dry cleaners.

Area sources can be classified into the following categories:

- Agriculture –
  - Animal waste
  - Fertilizer applications
  - Pesticide applications
  - Beef Cattle feedlots
  - Agricultural Tilling
  - Agricultural Burning

- Gasoline Distribution and Service Stations
- Light industrial and commercial sources
  - Bakeries
  - Construction Activities
  - Restaurant grilling
  - Traffic Markings
- Miscellaneous area sources
  - Paved Road Dust
  - Structure Fires
  - Unpaved Road Dust
  - Wildfires
  - Wind Erosion
- Non-road mobile sources
- Product storage and transport
- Residential Fuel Combustion
- Solvent use
  - Auto Body Refinishing
  - Degreasing
  - Dry Cleaning
  - Graphic Arts
  - Surface Coatings

- Stationary source fuel combustion
- Waste management
  - Publicly Owned Treatment Works (POTWs)
  - Municipal Landfills
  - Incineration

Agricultural Burning

Agricultural burning refers to the burning of field crops, wood, and leaves associated with agricultural activities. Some primary factors include type of crop, fuel loading (how much organic material per unit of land area), and type of burning (headfire or backfire). Other factors include moisture content and arrangement of the organic material to be burned.

Data Requirement	Data Origin
Agricultural Area Burned (by crop type)	Local data
Fuel Loading Factor	AP-42
Emission Factor	AP-42

Agricultural Tilling

Fugitive dust from agricultural operations can be a significant contributor of PM10 emissions In some rural areas. Agricultural operations are typically divided into three classifications: soil preparation, soil maintenance, and crop harvesting. Soil preparation includes such operations as plowing, harrowing, leveling, and dicing.

Data Requirement	Data Origin
Silt Content of Soil	
Agricultural Area Under Cultivation	
Number of Yearly Operations	
Percentage of Land Area Tilled	

Animal Waste

Livestock and other domesticated farm animals are a significant source of ammonia emissions. In a number of locations, animal waste constitute the largest single source of ammonia emissions. These emissions from livestock animals result from the conversion of excreted nitrogen to ammonia and its subsequent volatilization.

The magnitude of livestock ammonia emissions is dependent upon many factors. These factors include type of livestock, animal size and weight, manure storage practices, nitrogen content of livestock feed, and meteorology. (MexArea)

Data Requirement	Data Origin
Livestock Populations	
Livestock Residence Time	
Emission Factors: (kg NH_3/head-yr)	
Beef Cows	
Milk Cows	
Steers	
Bulls	
Calves	
Breeding Sows (>50 kg)	
Breeding Sows (20-50 kg)	
Market Hogs (<27.2 kg)	
Market Hogs (27.2-54.0 kg)	
Market Hogs (54.1-81.2 kg)	
Market Hogs (>81.3 kg)	
Chickens (Mother Animals >6 months)	
Chickens (Laying Hens >18 weeks)	
Chickens (Mother Animals <6 months)	
Chickens (Laying Hens <18 weeks)	
Other Chickens	
Ducks	
Turkeys	
Turkeys (<7 months)	
Turkeys (>7 months)	
Turkeys (fryer-roaster)	
Sheep and Lambs	
Goats	
Rabbits	
Horses	

Architectural Surface Coating

Painting contractors and individuals use architectural surface coatings to protect and enhance building interior and exterior surfaces. Architectural surface coating involves spreading a thin layer of coating such as paint, paint primer, varnish, or lacquer to architectural surfaces, and the use of solvents for thinning and cleanup. (MexArea)

Data Requirement	Data Origin
Population	Census

TOG Emission Factor 1.36 kg/person/yr	

Asphalt Application

Asphalt surfaces and pavements are composed of compacted aggregate and an asphalt binder. The binder holds the aggregate together and prevents movement or loss of aggregate. This source category addresses hydrocarbon emissions from the evaporation of these binders.

Data Requirement	Data Origin
Amount of each type of asphalt applied in the inventory region	Local authority
Physical properties of the asphalt (asphalt cement and diluent)	
TOG Emission Factor (i.e., wt% evaporated) 95 wt% for rapid cure 70 wt% for medium cure 25 wt% for slow cure	AP-42

Bakeries

Hydrocarbon emissions from bakeries consist primarily of ethanol that is produced during yeast fermentation. Other emissions from bakeries due to fuel combustion are not covered in this section; they should be calculated as part of the commercial fuel use category.

Data Requirement	Data Origin
Per capita method: (kg/person-yr)	
Population	Census
TOG emission factor	AP-42

Beef Cattle Feedlots

Beef cattle feedlots and stockyards are areas used for fattening or holding cattle prior to marketing or transfer to another location. The fattening process typically consists of feeding cattle for a period of four or five months. Feedlots and stockyards can be a significant source of fugitive particulate matter. (MexArea) and ammonia.

Data Requirement	Data Origin
PM_{10} Emission Factor[a] 12.0 Mg/1000 head throughput (13.0 tons/1,000 head throughput)	AP-42
PM_{10} Emission Factor[a] 62.4 kg/day-1000 head capacity (134.4 lbs/day-1,000 head capacity)	AP-42

Annual Cattle Throughput	
Average Number of Cattle in Feedlot	
Number of Days Cattle are in Feedlot	

Construction Activities

Building, road, and other construction activities are a potentially significant source of fugitive PM emissions. These emissions can be generated through a variety of activities, including land clearing, drilling and blasting, ground excavation, earth moving, and actual building construction. Emissions due to construction activities vary by site due to different levels of activity, operations, and meteorological conditions. (MexArea)

Data Requirement	Data Origin
Construction Area	Tribal authorities
Construction Duration	Tribal authorities
Emission Factor	AP-42
Site Specific Data	AP-42

Dry Cleaning

The dry cleaning industry is a service industry for the cleaning of clothing, draperies, leather goods, and other fabric items. Dry cleaning operations use halogenated or petroleum distillate organic solvents for cleaning.

Data Requirement	Data Origin
Per Capita Emission Factor Method: Population TOG Emission Factors (kg/person/yr)	Census
Dry cleaning (total)	
Halogenated solvents	
Small facilities	
Commercial/industrial facilities	
Petroleum solvents	
Per Employee Method: Employment by Industry Type TOG Emission Factors (kg/employee/yr)	
Dry cleaning (total)	
Halogenated solvents	
Small facilities	
Petroleum solvents	

Fertilizer Application

Fertilizers are used extensively to add or replenish nutrients that are depleted or otherwise missing from agricultural soil. Because of the large number of soil and crop types, many different types of fertilizers have been formulated. Note that nitrogen-based fertilizers release ammonia to the atmosphere.

Data Requirement	Data Origin
Annual Fertilizer Usage (by fertilizer type)	
Nitrogen Content (by fertilizer type)	
NH_3 Emission Factors: (kg NH_3/Mg total N)	
Anhydrous Ammonia	
Aqua Ammonia	
Nitrogen Solution	
Urea	
Ammonium Nitrate	
Ammonium Phosphates	
Ammonium Sulfate	
Ammonium Thiosulfate	
Other Straight Nitrogen	
N-P-K	

Gasoline Distribution and Service Stations

In the gasoline distribution industry, gasoline is transported from refineries by tanker trucks to bulk plants and terminals, and ultimately to service stations. Evaporative emissions occur at all points in the gasoline distribution process. Those operations that are considered as area sources include gasoline dispensing stations (service stations) and gasoline tank trucks in transit.

Data Requirement	Data Origin
Fuel consumption dispensed	Oil companies
TOG Emission factors (mg/liter of fuel)	AP-42
Submerged filling:	
Splash filling	
Balanced submerged filling	

Graphic Arts

Graphic arts include operations that are involved in the printing of newspapers, magazines, books, and other printed materials. Printing may be performed on various substrates (e.g., coated or uncoated paper, metal, or fabric). The difference between printing on paper coating is that printing always involves the application of ink by a printing press. (MexArea)

Data Requirement	Data Origin
Per Capita Emission Factor Method: Population	Census
TOG Emission Factor (for all types of graphic arts operations) 0.59 kg/person/yr (1.3 lb/person/yr)	U.S. EPA, 1991a

Note: The fifth edition of AP-42 (AP-42, 1995) presents a per capita emission factor of 0.4 kg non-methane volatile organic compound (VOC)/person/yr. However, this emission factor is based on 1981 data and, therefore, the 1991 U.S. EPA guidance is considered to be more current. It may be necessary to develop a tribal specific population based graphic art emissions factor.

Light Industrial and Commercial Fuel Combustion

Data Requirement	Data Origin
Fuel used in inventory area, by type	Fuel supplier
Fuel use by equipment type	Fuel supplier
Point source fuel use, by equipment type	
Fuel characteristics, as needed	Fuel supplier
Emission factors by fuel type, equipment type	AP-42,

Open Burning

In some areas, open burning is the preferred method of disposal of solid waste.

Data Requirement	Data Origin
Population	Census
Per Capita Waste Generation Rate (default - 0.893 kg/person-day)	Local tribal authority
Amount of Waste Disposed in Landfill (default - 70% of total waste)	Local tribal authority

Amount of Waste Recycled	Local tribal authority
Amount of Waste Disposed by Incineration	Local tribal authority
Amount of Waste Disposed by Other Means (abandonment, etc.)	Local tribal authority
Emission Factors	AP-42

Paved Road Dust

Motor vehicles moving over paved road surfaces entrain particulates in their turbulent wake. Paved road emission rates are estimated as a function of the silt loading of the paved surface and the mean weight of the vehicles traveling over the road. Road silt loading, in turn, is a function of the road type.

Data Requirement	Data Origin
Vehicle Miles Traveled (VMT)	Obtain from motor vehicle emissions modeling calculations.
Particle Size Multiplier (k): 4.6 g/VKT for PM_{10}	Appendices C.1 and C.2 of AP-42.
Silt Loading	Local samples (preferably by type of road)
Mean Vehicle Weight	Analysis of motor vehicle fleet, see motor vehicle emissions data for characteristics of the fleet

Pesticide Application

Most air emissions from pesticide use primarily occur because of the volatile nature of the active ingredients, carrier solvents, and other chemicals in pesticide formulations. Volatilization of pesticides can occur both during application and for some time after application. general, volatile pesticides consist of an "active" ingredient and various "inert" ingredients. The terms "active" and "inert" do not refer to photochemical activity; rather, they are a measure of compound toxicity. (MexArea)

Data Requirement	Data Origin
Annual Pesticide Usage (by specific formulation)	
Method of Application	
Types of Active Ingredients in Formulation	Pesticide container, pesticide manufacturer, end-use formulator, or local distributor. Active ingredients for common trade name pesticides provided in AP-42
Vapor Pressures of Active Ingredients	Some vapor pressures provided in AP- 42,
Type of Formulation (e.g., emulsion, solution, granules, among others)	Pesticide container, pesticide manufacturer, end-use formulator, or local distributor.
Percentage of Active and Inert Ingredients	Pesticide container, pesticide manufacturer, end-use formulator, or local distributor.

Volatile Content of Inert Ingredients	Pesticide manufacturer or end-use formulator. Also, estimated average volatile contents provided in AP-42

Residential Fuel Combustion

Data Requirement	Data Origin
Fuel used in inventory area, by fuel type	Fuel supplier
Population or Housing Data	Census
Fuel characteristics, as needed	Fuel supplier
Emission factors by fuel type, equipment type	AP-42,

Solvent Use - Commercial/Consumer

Consumer and commercial products may use hydrocarbons as propellants, to aid in product drying (through evaporation), to act as co-solvents and as cleaning agents. These products, which use hydrocarbons, are large in number, highly dispersed, and individually emit relatively small amounts of TOG. Some typical products, which release TOG, include aerosols, household products, personal care products, automotive aftermarket products, adhesives and sealants, and commercial and household pesticides.

Data Requirement	Data Origin
Per Capita Emission Factor Method: Population	Census
ROG Emission Factors (kg/person/yr)	
Adhesives and Sealants	
Aerosol Products	
Automotive Aftermarket Products	
Commercial/Household Pesticides	
Household Products	
Miscellaneous Products	
Personal Care Products	
TOTAL ROG	
TOG Emission Factors (kg/person/yr)	
Adhesives and Sealants	
Aerosol Products	
Automotive Aftermarket Products	
Commercial/Household Pesticides	
Household Products	
Miscellaneous Products	
Personal Care Products	

TOTAL TOG	

Solvent Use - Industrial Surface Cleaning

Surface cleaning operations involve the use of solvent liquids or solvent vapors to remove water-insoluble contaminants such as grease, oils, waxes, carbon deposits, fluxes, and tars from metal, plastic, glass, and other surfaces. This process takes place in a large variety of manufacturing, scientific, and repair operations. (MexArea)

Data Requirement	Data Origin
Per Capita Emission Factor Method: Population TOG Emission Factors (kg/person/yr)	Census
Solvent Cleaning (total)	
Batch Cold Cleaning Auto Repair Manufacturing	
Batch Vapor and In-line Machines Electronic and Electrical Other	
Per Employee Method: Employment by Industry Type TOG Emission Factors (kg/employee/yr)	
Solvent Cleaning (total)	
Batch Cold Cleaning Auto Repair Manufacturing	
Batch Vapor and In-line Machines Electronics and Electrical Other	

Solvent Use - Industrial Surface Coating

Surface coating operations consist of applying a thin layer of coating such as paint, varnish, lacquer, or paint primer to an object for decorative or protective purposes. Surface coatings are applied during the manufacture of a wide variety of products, including furniture, cans, automobiles, airplanes and other transportation equipment, machinery, appliances, flat wood, wire, and other miscellaneous products. In addition, coatings are used in maintenance operations at industrial facilities. Solvents contained in the surface coatings evaporate as the coating is applied and dries. (MexArea)

Data Requirement	Data Origin
Per Capita Emission Factor Method:	
Population	Census
TOG Emission Factor 1.28 kg/person/yr	
Per Employee Method:	
Employment by Industry Type	

Structure Fires

Structure fires are unlike other combustion sources, since the combustion of materials are unintentional and the amount of material burned can be difficult to estimate.

Determination of structure fires emissions will require an assessment of the tribal lands typical materials for building construction. Continental U.S. homes are predominantly built of wood, while. Commercial buildings are based on steel and aggregates (bricks and cement).

Data Requirement	Data Origin
Number of Fires	Fire department
Average Percent Structural Loss	U.S. default values.
Amount of Combustible Structural Material	U.S. default values.
Amount of Combustible Building Contents	U.S. default values.
Emission Factors (kg/Mg)	ARB, 1995
TOG 6.95	ARB, 1995
CO 84.0	ARB, 1995
NO_x 2.0	ARB, 1995
PM 5.4	ARB, 1995

Traffic Paint

Traffic paint application is the painting of centerlines, edge stripes, directional markings, parking lot markings, and paved and unpaved surfaces to improve traffic flow. Traffic markings can include solvent- and water-based paints, which are usually applied with a spray, or in the form of thermoplastics or preformed tapes that are epoxied to the road surface.

Data Requirement	Data Origin
Population	Census
TOG emission factor 0.04 kg/person/yr	

Unpaved Road Dust

Motor vehicles moving over unpaved road surfaces entrain particulates in their turbulent wake. As vehicles pass over the surface, the force of the wheels on the surface grinds the road material into smaller particles, thereby partially replenishing the road silt content.

Unpaved road dust emission rates are estimated as a function of traffic volume, silt content of the unpaved surface, speed of the vehicles, mean number of wheels and mean weight of the vehicles traveling over the surface, and the number of days with precipitation greater than 0.254 mm. Road silt content, defined as particles less than 75 micrometers in size, varies spatially and by road type (e.g., gravel roads have different silt contents than dirt roads).

Data Requirement	Data Origin
Vehicle Miles Traveled (VMT)	Obtain from motor vehicle emissions modeling calculations.
Particle Size Multiplier (k): 0.36 g/VKT for PM_{10}	Appendices C.1 and C.2 of AP-42.
Silt Content	Local samples (preferably by type of road)
Mean Vehicle Weight	Analysis of motor vehicle fleet, see motor vehicle emissions data for characteristics of the fleet
Vehicle Speed	Observation of local speeds
Mean Number of Wheels	Analysis of motor vehicle fleet, see motor vehicle emissions data for characteristics of the fleet

Wastewater Treatment

Various industrial processes generate wastewater streams that contain organic compounds. These streams typically undergo collection, contaminant treatment, and/or storage steps before they are discharged into either a receiving body of water or a municipal treatment plant (also called publicly owned treatment works [POTWs] in the U.S.) for further treatment. During some of these operations, the wastewater is open to the atmosphere and organic compounds may be emitted into the air.

In addition to industrial wastewater, POTWs may also treat water from residential, institutional, or commercial facilities, water that enters the sewer system from the ground and/or storm water runoff. These other types of wastewater generally do not contain significant levels of TOG. In the U.S., if the actual annual industrial wastewater contribution to the POTWs of an inventory region is not known, then 16% of the total annual flow (i.e., the national average) is recommended as a default value.

Data Requirement	Data Origin
Quantity of industrial wastewater treated in the inventory region	
Emission factor: (kg TOG/liter)	

Wildfires

Wildfires occur naturally in nature. However, two significant causes of wildfire emissions originate from ignited fires intended to promote the growth of grass for cattle grazing and. the use of prescribed fires to manage forest ecosystems.

Data Requirement	Data Origin
Number of Fires	
Average Percent Structural Loss	
Amount of Combustible Structural Material	
Amount of Combustible Building Contents	
TOG Emission Factor[a] 6.95 kg/Mg (13.9 lbs/ton)	ARB, 1995
CO Emission Factor[a] 84 kg/Mg (168 lbs/ton)	ARB, 1995
NO_x Emission Factor[b] 2.0 kg/Mg (4.0 lbs/ton)	ARB, 1995
PM Emission Factor[a] 5.4 kg/Mg (10.8 lbs/ton)	ARB, 1995

Wind Erosion

During periods of high wind events, small dust particles may be entrained by the wind and emitted to the atmosphere as particulate matter. These emissions are typically associated with disturbed land, such as agricultural fields under cultivation, or large construction sites. In addition, emissions may result from vacant lots, road shoulders that contain loose dirt, and from unpaved roads. (MexArea)

Data Requirement	Data Origin
Meteorological Data	NCDC
Crop Acreage	

Appendix F - Term Definition

Activity Rate. Activity data are usually directly related to the emissive process. For industrial processes, activity data are generally reported as process weight rates (e.g., kg, ton, or L per month of material used or manufactured). Similarly, for fuel-burning equipment, activity data are reported as fuel consumption rates (e.g., tons, L, or m3, or MJ per hour or per month). (MexArea)

Actual Emissions are the actual rate of emissions of a pollutant from an emissions unit calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period. (EIIP)

Allowable Emissions are the emissions rate that represents a limit on the emissions that can occur from an emissions unit. This limit may be based on a federal, state, or local regulatory emission limit determined from state or local regulations and/or 40 Code of Federal Regulations (CFR) Parts 60, 61, and 63. (EIIP)

Capture Efficiency: The capture efficiency is defined as the fraction of pollutant emitted from the processing point that is actually gathered by baffles, hoods, or other capturing devices, and routed to the control device. Capture efficiency can be estimated by tests preformed at the facility for which emissions are being estimated.

Census-Based Emission Factors. Emission factors relate the quantity of a pollutant released to a unit of activity. Emission factors can be either process-based or census based. The use of census-based emission factors is an efficient method for dispersed and numerous emission source types that cannot be readily characterized by knowledge of process rates, fuel consumption rates, and / or material feed rates. (MexArea)

CHEMDAT: A Lotus 1-2-3 spreadsheet prepared by the EPA's Emission Standards Division that includes analytical models for estimating VOCs from treatment, storage, and disposal facility (TSDF) processes. The original models include disposal impoundments, closed landfills, land treatment facilities, and aeration and non-aeration impoundment processes.

Continuous Emissions Monitoring *(CEM)* is any monitoring effort that "continuously" measures (i.e., measures with very short averaging times) and records emissions. In addition to measuring and recording actual emissions during the time of monitor operation, CEM data can be used to estimate emissions for different operating periods and longer averaging times. (EIIP)

Control Efficiency. The overall control efficiency is the product of the capture device efficiency and the control device efficiency. The capture device efficiency indicates the percentage of the emission stream that is taken into the control system, and the control device efficiency indicates the percentage of the air pollutant that is removed from the emission stream before release to the atmosphere. (MexArea)

Control Effectiveness: The control device efficiency is the percentage of the air pollutant that is removed from the emission stream before release to the atmosphere.

Cyclone: The cyclone (also known as a "mechanical collector") is a particulate control device that uses gravity, inertia, and impaction to remove particles from a ducted stream. Large diameter cyclones are often used as primary cleaners to remove the bulk of heavier particles before from an air stream before entering a secondary cleaner (EIIP, 1995).

Electrostatic Precipitator: Electrostatic precipitators (ESPs) are used to control particulate emissions. ESPs employ electrical forces to remove particles from the gas stream onto collecting plates. The accumulated particles are then knocked or washed off the plates and into collecting hoppers (EIIP, 1995).

Emission Factors: Ratios that relate the quantity of a pollutant emitted to a single unit of activity. The activity may be process-based data (e.g., throughput, hours of operation, surface area) or census-based data (e.g., population, employment). (MexArea)

Emissions Models: Equations developed when emissions are not directly related to a single parameter that may use computers if a large number of complex calculations are involved. For example, the U.S. Environmental Protection Agency (U.S. EPA) TANKS program is a computer emissions model used to estimate emissions from storage tanks. (MexArea)

Extrapolation: Scaling emissions from a given source to another source based on a scaling parameter known for both sources (e.g., production quantity, land area, number of employees). . (MexArea)

Fabric Filter: Fabric filter systems (often called baghouses) filter particles through filtering elements (bags). Particles are caught on the surface of the bags, while the cleaned air stream passes through. Fabric filters can achieve the highest particulate collection efficiency of all particulate control devices (EIIP, 1995b).

Fugitive Emission Sources: Fugitive component emissions occur from process equipment whenever the liquid or gas stream leaks. Components such as pumps, valves, pressure relief valves, flanges, agitators, and compressors are potential sources that can leak due to seal failure. Additional storage piles of granulated materials can be a significant source of fugitive emissions.

GIS - Geographical Information System: The Geographical Information System uses modern computer technology to store, retrieve, analyze, update, and display spatially arranged data (maps). Because the characterization of emissions is enhanced by knowledge of the location and spatial arrangement of all identified sources, the Geographical Information System can be a useful tool for emissions inventories. Locating each point source, defining the boundaries around each area source, and mapping all road networks can provide valuable information for formulating, evaluating, and implementing emissions reduction strategies. Mapping point and area sources is also

important in defining, and subsequently modifying, nonattainment area boundaries. Map features are available in digital formats from transportation departments, tax offices, planning/zoning offices, and emergency response agencies. (EIIP)

GPS – Global Positioning System: The Global Positioning System performs map feature registration using banks of geosynchronous Earth-orbiting satellites that act as known reference points in triangulation calculations. The coordinates of the unknown Earth surface location can be calculated from the known coordinates of orbiting satellites. This can serve as a valuable quality assurance/quality control (QA/QC) check for locating point source data. Geographical positioning units offer a cost-effective alternative for locating emissions sources, assuming that a registration accuracy of plus or minus three meters will provide adequate mapping resolution within a non-attainment area that covers tens or hundreds of square miles. It is anticipated that as Global Positioning Systems become cheaper and more common, they will be the standard method of determining coordinate locations, if the required accuracy goal can be achieved. Other methods, such as map reading, address matching, and zip code centroids may then decrease in popularity. (EIIP)

LAEEM - LANDFILL AIR EMISSIONS ESTIMATION MODEL: The Landfill Air Emissions Estimation Model (LAEEM) is a computer program specifically designed for use by state and local regulatory agencies to monitor the emissions of HAPs from landfills. The system allows the user to enter specific information regarding the characteristics and capacity of an individual landfill and to project the emissions of methane, CO, non-methane organic compounds, and individual HAPs over time using the Scholl Canyon decay model for landfill gas production estimation. The Scholl Canyon Model is a first-order decay equation that uses site-specific characteristics for estimating the gas generation rate. In the absence of site-specific data, the program provides conservative default values. The user also may tailor decay rate characteristics on an individual basis. An integrated decay rate constant calculator is provided for landfills that may be operating a gas recovery system to allow more accurate assessments of decay attributes.

Material Balance: using measurements of all but the air component of a process to determine the air emissions. Most commonly used for solvent evaporation sources where data are not available to support the other approaches. The material or mass balance approach is suitable for estimating emissions associated with solvent evaporation. In its simplest form, a material balance approach assumes that all solvent consumed by a source evaporates. (MexArea)

Materials Handling: Materials transported via truck or rail, which are not covered, may also produce particulate matter emissions. Within a facility, materials such as coal may be transported via conveyor belts or pneumatic transport systems, which result in fugitive particulate emissions.

Meteorological and Climatological Data: Meteorological and climatological information are needed when estimating emissions from certain emission sources. For

example, parameters such as annual average ambient temperature and wind speed are required by the emission estimating equations for storage tanks.

Mobile Sources include all nonstationary sources, such as automobiles, trucks, aircraft, trains, construction and farm equipment, and others. Mobile sources are a subcategory of area sources, and are generally not required to submit individual emissions estimates. (EIIP)

Particulate Matter of aerodynamic diameter less than or equal to 10 micrometers (PM10*)* is a measure of small solid matter suspended in the atmosphere. Small particles can penetrate deeply into the lung where they can cause respiratory problems. Emissions of PM10 are significant from fugitive dust, power plants, commercial boilers, metallurgical industries, mineral industries, forest and residential fires, and motor vehicles. (EIIP)

Particulate Matter of aerodynamic diameter less than or equal to 2.5 micrometers (PM2.5) is a measure of fine particles of particulate matter that come from fuel combustion, agricultural burning, woodstoves, etc. On November 27, 1996 the U.S. Environmental Protection Agency proposed to revise the current primary (health-based) PM standards by adding a new annual $PM_{2.5}$ standard. (EIIP)

Petroleum Industry: involves the refining of crude petroleum and the processing of natural gas into a multitude of products, as well as the distribution and marketing of petroleum-derived products. The primary pollutant emitted is VOC (volatile organic compounds) arising from leakage, venting, and evaporation of the raw materials and finished products. Significant amounts of sulfur oxides, hydrogen sulfide, particulate matter, and a number of toxic species can also be generated from operations specific to this industry.

Plant Level Inventory: Performed at plants or facilities that contain several pollutant-emitting sources and activities.

Process Emissions are emissions from sources where an enclosure, collection system, ducting system, and/or stack (with or without an emission control device) is in place for a process. Process emissions represent emissions from process equipment (other than leaks) where the emissions can be captured and directed through a controlled or uncontrolled stack for release into the atmosphere. (EIIP)

Process Level Inventory: More specific emissions information than the Plant Level Inventory. It describes the emission unit operations of a process source category.

Quality Rating System - Emissions Factor: The *Compilation of Air Pollutant Emission Factors*, AP42, uses the following emission factor quality ratings:

> **A - Excellent** - The emission factor was developed only from A-rated test data taken from many randomly chosen facilities in the industry population. The

source category is specific enough to minimize variability within the source category population.

B - Above Average - The emission factor was developed only from A-rated test data from a reasonable number of facilities. Although no specific bias is evident, it is not clear if the facilities tested represent a random sample of the industry. As with the A-rating, the source category is specific enough to minimize variability within the source category population.

C - Average - The emission factor was developed only from A- and B-rated test data from a reasonable number of facilities. Although no specific bias is evident, it is not clear if the facilities tested represent a random sample of the industry. As with the A-rating, the source category is specific enough to minimize variability within the source category population.

D - Below Average - The emission factor was developed only from A- and B-rated test data from a small number of facilities, and there may be reason to suspect that these facilities do not represent a random sample of the industry. There also may be evidence of variability within the source category population.

E - Poor - The emission factor was developed from C- and D-rated test data, and there may be reason to suspect that the facilities tested do not represent a random sample of the industry. There also may be evidence of variability within the source category population.

Scrubber: Scrubbers are used to remove particulate matter and sulfur oxides. Wet scrubbers utilize water to remove particles by direct contact from an air stream. Sulfur oxides may be controlled with alkaline liquids in wet or dry scrubbers.

Source Sampling: direct measurements of the pollutant concentration in a known volume of gas and of the stack gas flow rate. Most commonly used for combustion emission sources. (MexArea)

Source Tests are short-term tests used to collect emissions data that can then be extrapolated to estimate long-term emissions from the same or similar sources. Uncertainties arise when source test results are used to estimate emissions under process conditions that differ from those under which the test was performed.

Storage Piles: A potential significant source of particulate matter emissions if not properly covered and otherwise controlled. Materials typically found in storage piles include coal at power plants, rocks at concrete and/or asphalt production facilities, and other materials stored in bulk.

Surveying: questionnaires designed to collect emissions data. Often used to collect point source data developed at the facility level or area source data from a representative sampling of sources from a given source category. (MexArea)

TANKS: The TANKS program is designed to estimate emissions of organic chemicals from storage tanks. After the user provides specific information concerning the storage tank and its contents, the TANKS program estimates the annual or seasonal emissions and produces a report. The emissions can be separated into standing storage and working losses. The TANKS program has a chemical database of over 100 organic liquids and meteorology data from over 250 cities in the U.S. The user may add new chemicals and cities to their version of the database. The tank types addressed in the program include vertical and horizontal fixed roof tanks, and internal and external floating roof tanks. The tank contents can consist of single component liquid or a multi-component mixture.(EIIP)

Temporal Adjustment. Most inventories traditionally estimate annual emissions. Hence, all procedures, emission factors, correction factors, and activity levels used in the inventory have been developed to represent annual average conditions. For certain air quality planning activities, temporal adjustments must be made to the annual emission estimates. . (MexArea)

WATER9: A menu-driven computer program that is intended for estimating emissions from wastewater treatment systems only. WATER9 uses some of the same models found in CHEMDAT, but has data for a total of 800 compounds.

Appendix G - Common Acronyms

Acronym	Definition
ACT	Alternative Control Technology Guideline
ADT	Average daily traffic
AFS	AIRS Facility Subsystem
AFSEF	AIRS Facility Subsystem Emission Factors Database
AIRS	Aerometric Information Retrieval System
ALAPCO	Association of Local Air Pollution Control Officials
APTI	Air Pollution Training Institute – US EPA
BACT	Best Available Control Technology
BEIS	Biogenic Emissions Inventory System
BOD	Biological Oxygen Demand
BTU	British Thermal Unit
CAS	Chemical Abstract Services
CE	Control Efficiency
CEM	Continuous Emissions Monitoring
CFC	Chlorofluorocarbon
CH_4	Methane
CHIEF	Clearinghouse for Inventories and Emission Factors – US EPA
cm	Centimeter
CMS	Continuous Monitoring System
CO	Carbon monoxide
DARS	Data Attribute Rating System
DOE	Department of Energy
DQI	Data quality indicators
DQO	Data quality objective
EET	Emissions estimating techniques
EF	Emission factor
EI	Emissions Inventory
EIIP	Emission Inventory Improvement Program
FAA	Federal Aviation Administration
FAEED	Federal Aircraft Engine Emission Database
FIRE	Factor Information Retrieval System
g	Gram
gr	Grain
GIS	Geographic Information System
ha	Hectare
HAP	Hazardous Air Pollutant
HC	Hydrocarbon
HCFC	Hydrochlorofluorocarbon
HDDV	Heavy duty diesel vehicles
HDGV	Heavy duty gasoline vehicles
HFC	Hydrofluorocarbon
hp	Horsepower
hr	Hour

IC	Internal combustion
kcal	Kilocalorie
kg	Kilogram
km	Kilometer
kph	Kilometers per hour
LAEEM	Landfill Air Emissions Estimation Model
lb	Pound
LDDT	Light duty diesel trucks
LDDV	Light duty diesel vehicles
LDGT	Light duty gasoline trucks
LDGV	Light duty gasoline vehicles
LPG	Liquefied petroleum gas
LTO	Landing and takeoff
m3	Cubic meter
MACT	Maximum Achievable Control Technology
MC	Motorcycle
Mg	Megagram (i.e., 106 g = 1 metric ton)
mg	Milligram
mm	Milliliter
mm Hg	Millimeters of mercury
mol	Mole
mph	Miles per hour
MWC	Municipal Waste Combustors
NA	Not Available
NH_3	Ammonia
NMHC	Non-methane hydrocarbons
NO	Nitrogen monoxide
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
N-P-K	Nitrogen-phosphorus-potassium
O_2	Oxygen
ORD	Office of Research and Development – US EPA
PM	Particulate matter
$PM_{2.5}$	Particulate matter of less than 2.5 microns aerodynamic diameter
PM_{10}	Particulate matter of less than 10 microns aerodynamic diameter
POTW	Publicly owned treatment works
ppmw	parts per million - weight
psi	Pounds per square inch
psia	Pounds per square inch absolute
QA	Quality Assurance
QC	Quality Control
RE	Rule Effectiveness
ROG	Reactive organic gas
RP	Rule penetration
RVP	Reid vapor pressure
S	Saturation factor

S	Sulfur
SAF	Seasonal Adjustment Factor
SCC	Source Classification Code
SIC	Standard Industrial Classification
SIMS	Surface Impoundment Modeling System
SO_2	Sulfur dioxide
SO_x	Sulfur oxides
STAPPA	State and Territorial Air Pollution Program Administrators
THC	Total hydrocarbons
TIM	Time in mode
TOC	Total organic compound
TOG	Total organic gas
ton	English ton (i.e., 2,000 lbs)
TSDF	Treatment, Storage, and Disposal Facility
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
VKT	Vehicle kilometers traveled
VMT	Vehicle miles traveled
VOC	Volatile organic compound
vol	Volume
wt	Weight