Fraser River Action Plan

Development of the Design Basis for an Inventory of Sources and Emissions of Toxic Air Contaminants for B.C.

CANADA'S GREEN PLAN
LE PLAN VERT DU CANADA

Canada

DOE FRAP 1993-17

Environment Canada Environnement Canada

DEVELOPMENT OF THE DESIGN BASIS FOR AN INVENTORY OF SOURCES AND EMISSIONS OF TOXIC AIR CONTAMINANTS FOR B.C.

DOE FRAP 1993-17

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March 1993

DISCLAIMER

This report was funded by Environment Canada under the Fraser River Action Plan through its Fraser Pollution Abatement Office. The views expressed herein are those of the authors and do not necessarily state or reflect the policies of Environment Canada.

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1. INTRODUCTION

1.1 BACKGROUND

The Fraser River Action Plan includes as one its goals the virtual elimination of toxic inputs into the Fraser Basin. Atmospheric contaminant deposition is one such input, and, as a result, an inventory of sources and emissions of toxic air contaminants for British Columbia is to be carried out. The inventory will provide information about emission types, volumes and distribution, and, as a result, will also enable future toxic emission studies to be identified and prioritized, as well as assisting in public information needs.

Emissions inventories for common pollutants (CO, NO_x, particulate, SO_x and VOC) have been and continue to be produced on both a provincial and national basis, and the relevant estimating techniques continue to be refined and improved. However, for several reasons, emissions inventories for non-common or toxic pollutants have not received the same level of attention or effort. These reasons have included the generally smaller sizes of the emissions, a lack of information about source/toxic pollutant relationships and limited means of quantifying the emissions. However, because of the potential large impact of these toxic pollutants on the receptor/receiving environment, there has been an increased amount of effort in recent years aimed at enabling more reliable toxic emission inventories to be produced.

This report is submitted in partial fulfilment of the requirements of a project whose overall objective was to develop a design basis for an inventory of sources and emissions of toxic atmospheric pollutants for British Columbia for the year 1990. This objective would be achieved by a review of current toxic inventory methodologies and available relevant data, and recommending a computer-based data base and software system which would be compatible with, and operate as, a module of the Residual Discharge Information System (RDIS) of Environment Canada, Conservation and Protection.

1.2 OVERALL APPROACH FOR A B.C. INVENTORY AND SPECIFIC OBJECTIVES OF THIS PROJECT

In general, air toxics emissions inventories fall into two major categories: preliminary screening and detailed emissions estimates. Preliminary screening is often carried out in advance of a detailed emissions inventory because it allows subsequent effort to be focused on the emissions and sources of highest priority. The level of

detail actually required is dependent upon the needs of the end-user, and Table 1 gives an indication of the increasing levels of detail as the end-use becomes more demanding (U.S. EPA, 1990). Some potential uses are listed in Table 2, with a general tendency for more demanding requirements on going down the list.

The intended use of the results from the B.C. toxics inventory in atmospheric dispersion and deposition modelling requires a system capable of giving good spatial and temporal resolution to the emissions, as well as making use of the best available data for emissions identification and quantification. In order to meet these requirements, the overall approach was to parallel the B.C. common pollutants emissions inventory system and the associated data base software (EIS) such that the larger number of toxic pollutants could be inventoried. The resulting toxics inventory system, TOXS, would use reference files from RDIS, and thus have spatial and temporal capability and also have the ability to process emissions data of different types (emission factor calculations, engineering estimates, etc.). It should be noted that TOXS will operate as a module of RDIS, and as such will not be immediately compatible with EIS. However, the design of EIS is such that it could relatively easily be expanded to cover the required air toxics, and make use of many of the features developed for TOXS.

Since there is limited source data presently available on toxics emissions in B.C., identification and quantification of emissions will rely heavily on emission factors and speciation profiles (Section 2). Thus, in addition to providing the overall emissions inventory system, this project had the objective of reviewing literature and other sources of data, and recommending factors and profiles which could be used to calculate the emissions estimates. The emission factors would be based upon studies specific to B.C. wherever possible, but the relative lack of such studies would require extensive use of factors produced for more general use.

1.3 OTHER CONSIDERATIONS

Other considerations which are relevant to the eventual design of any toxics emissions inventory, include the following:

- actual versus allowable emissions
- annual versus short-term emissions
- accidental versus routine or predictable emissions
- process versus fugitive emissions.

TABLE 1 INCREASE IN INVENTORY COMPLEXITY WITH END-USER DEMANDS

Inventory Use	Level of Complexity
Less Demanding Applications	Simple Data Summaries
	Aggregated Source Data
	Major Point Source Emphasis
	More Source Contacts
	Stack and Exhaust Data
	Control Equipment Type and Efficiency
	Spatial and Temporal Resolution
	Inclusion of Minor and Area Sources
	Control Strategy Simulation Capability
More Demanding Applications	Complex Data Handling Capability

TABLE 2 POTENTIAL USES OF AIR TOXICS EMISSION INVENTORIES

1. To identify sources and general emission strengths, patterns and trends.
2. To collect and store data from related toxic emissions programs, e.g.:
   - permit/compliance data
   - public information needs
   - emergency response/toxic hot spots programs
3. To focus subsequent inventory work.
4. To ensure optimum siting of ambient air monitors.
5. To provide input to dispersion models.
6. To identify multiple source and multiple pollutants problem areas.
7. To develop control strategies and regulations.

1.3.1 Actual Versus Allowable Emissions

An emissions inventory is ideally based on actual emissions. Allowable or permitted emissions provide a means of determining the probable maximum level of emissions, or can be prorated to give estimates of the actual emissions. Typically, however, emissions of toxic pollutants are not permitted on a specific chemical basis, and it would only be possible to give permitted emissions for a limited number of sources and source types, for example fuel combustion sources (based on speciation profiles).

1.3.2 Annual Versus Short-Term Emissions

Annual estimates of toxic emissions are appropriate when evaluating the risks of long-term exposure, such as carcinogenic potential. Acute health effects, however, often require the knowledge of short-term, maximum concentrations in a localized area. Any toxic emissions inventory should therefore make maximum use of temporal and spatial emission information.

1.3.3 Accidental Versus Routine (Predictable) Emissions

Routine, predictable emissions are those that can be expected to recur in a certain time frame, and include continuous emissions, as well as intermittent emissions from scheduled but discontinuous operations (e.g. batch processes, start-ups, shut-downs and maintenance operations). Accidental emissions or releases are typically short-term and unpredictable. The associated accidental event may include equipment failure, pressure relief and spillage, and it is not possible to predict the nature, size or frequency of the associated atmospheric release. Accidental releases cannot therefore be readily included in an emissions inventory, unless they can be easily identified because of related recordkeeping and the size and nature of the emissions determined.

1.3.4 Process Versus Fugitive Emissions

Although process emissions are obvious sources of toxic chemicals entering the atmosphere, fugitive emissions can be very significant from some source categories and should not be overlooked. Fugitive emissions include: material storage, loading and unloading, process valves, flanges, sampling points, etc., and are especially important in categories such as chemical manufacturing, and those where chemicals and/or solvents are used, e.g. dry cleaning.

2. METHODS OF CALCULATING TOXIC EMISSION ESTIMATES AND SOURCES OF DATA

In order to quantify the emissions of an air toxic from a particular source, the following methods are available:

- speciation profiles
- emission factors
- mass balances and engineering calculations
- source monitoring.

The accuracy or level of confidence of the emission estimate increases on going down this list, but most of the available data relates to the first two of these. Speciation profiles and emission factors, therefore, provide the basis for the emission estimating software and data base accompanying this report.

2.1 SPECIATION PROFILES

Most air toxics are a subset of either particulate matter (TPM) or volatile organic compounds (VOCs): toxic metals and heavy organics are generally contained in the particulate emissions while most toxic light organics are part of the VOC emissions. Chemical analysis of these two types of emissions can be used to identify the concentrations of the toxic species present, and hence be used to define speciation profiles. Examples of speciation profiles are given in Tables 3 and 4.

As a result of pooling together the speciation profiles from a number of sources of the same type, an average or typical profile can be developed for both the particulate and VOC emissions. Hence, once the sizes of the particulate and VOC emissions are estimated, the toxic emissions can be calculated based on the respective profile:

$$E_T = E_{VOC} \times F_{TV}$$

OR $$E_T = E_{PART} \times F_{TP}$$

where E_T = emission of a given toxic
E_{VOC} = emission of VOCs
F_{TV} = fraction of the toxic in the VOC emission
E_{PART} = emission of particulate
F_{TP} = fraction of the toxic in the particulate emission

TABLE 3 EXAMPLE OF A PARTICULATE SPECIATION PROFILE (FROM EPA SPECIATE DATA BASE)

PM Profile Speciation Report

Profile Name : Slash Burning
Profile Number : 42301
Data Quality : B/C

Control Device : Not applicable
Reference(s) : 159
Data Source : Mean and standard deviation values of 8 fine particle slash burning samples obtained from plume at ground level. Analyzed by AAS, XRF, IC, and carbon oxidation. 3 smolder phase and 5 active burn phase samples.

SCC Assignments: 50300201

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.067	0.149	0.067	0.149	0.067	0.192	0.067	0.149
7439-95-4	12	Mg	NA	0.000	NA	0.000	NE	0.000	NA	0.000
7429-90-5	13	Al	0.455	0.298	0.455	0.298	0.455	0.392	0.455	0.298
7440-21-3	14	Si	0.802	0.633	0.802	0.633	0.802	0.827	0.802	0.633
7723-14-0	15	P	<	0.000	<	0.000	NE	0.000	<	0.000
7704-34-9	16	S	0.281	0.220	0.281	0.220	0.281	0.287	0.281	0.220
7782-50-5	17	Cl	0.016	0.041	0.016	0.041	0.016	0.053	0.016	0.041
7440-09-7	19	K	0.442	0.202	0.442	0.202	0.442	0.272	0.442	0.202
7440-70-2	20	Ca	0.713	0.962	0.713	0.962	0.713	1.244	0.713	0.962
7440-22-2	21	Sc	<	0.000	<	0.000	NE	0.000	<	0.000
7440-32-6	22	Ti	0.010	0.017	0.010	0.017	0.010	0.022	0.010	0.017
7440-62-2	23	V	<	0.000	<	0.000	NE	0.000	<	0.000
7440-47-3	24	Cr	<	0.000	<	0.000	NE	0.000	<	0.000
7439-96-5	25	Mn	0.080	0.095	0.080	0.095	0.080	0.123	0.080	0.095
7439-89-6	26	Fe	0.342	0.255	0.342	0.255	0.342	0.334	0.342	0.255
7440-48-4	27	Co	<	0.000	<	0.000	NE	0.000	<	0.000
7440-02-0	28	Ni	<	0.000	<	0.000	NE	0.000	<	0.000
7440-50-8	29	Cu	0.001	0.003	0.001	0.003	0.001	0.004	0.001	0.003
7440-66-6	30	Zn	0.012	0.012	0.012	0.012	0.012	0.016	0.012	0.012
7440-55-3	31	Ga	<	0.000	<	0.000	NE	0.000	<	0.000
7440-56-4	32	Ge	<	0.000	<	0.000	NE	0.000	<	0.000
7440-38-2	33	As	<	0.000	<	0.000	NE	0.000	<	0.000
7782-49-2	34	Se	<	0.000	<	0.000	NE	0.000	<	0.000
7726-95-6	35	Br	0.010	0.010	0.010	0.010	0.010	0.013	0.010	0.010
7440-17-7	37	Rb	<	0.000	<	0.000	NE	0.000	<	0.000
7440-24-6	38	Sr	<	0.000	<	0.000	NE	0.000	<	0.000
7440-67-7	40	Zr	<	0.000	<	0.000	NE	0.000	<	0.000
7440-22-4	47	Ag	<	0.000	<	0.000	NE	0.000	<	0.000
7440-43-9	48	Cd	<	0.000	<	0.000	NE	0.000	<	0.000
7440-31-5	50	Sn	<	0.000	<	0.000	NE	0.000	<	0.000
7440-36-0	51	Sb	<	0.000	<	0.000	NE	0.000	<	0.000
7440-46-2	55	Cs	<	0.000	<	0.000	NE	0.000	<	0.000
7440-39-3	56	Ba	<	0.000	<	0.000	NE	0.000	<	0.000

TABLE 3 EXAMPLE OF A PARTICULATE SPECIATION PROFILE (FROM EPA SPECIATE DATA BASE) [CONTINUED]

PM Profile Speciation Report - continued (profile 42301)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um %wt	0-10 um unc	Total Measured %wt	Total Measured unc
7440-45-1	58	Ce	<	0.000	<	0.000	NE	0.000	<	0.000
7439-97-6	80	Hg	<	0.000	<	0.000	NE	0.000	<	0.000
7439-92-1	82	Pb	0.006	0.009	0.006	0.009	0.006	0.012	0.006	0.009
	200	TC	80.604	6.215	80.604	6.215	80.604	16.692	80.604	6.215
	201	OC	NA	0.000	NA	0.000	NE	0.000	NA	0.000
	202	EC	NA	0.000	NA	0.000	NE	0.000	NA	0.000
	203	SO4	0.637	0.373	0.637	0.373	0.637	0.493	0.637	0.373
	204	NO3	1.056	1.248	1.056	1.248	1.056	1.616	1.056	1.248
	205	NH4	0.708	0.452	0.708	0.452	0.708	0.595	0.708	0.452
TOTALS:			86.242		86.242		86.242		86.242	

VOC Profile Speciation Report

Profile Name : Open Burning Dump - Landscape/Pruning
Profile Number : 0121
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 60
Data Source : Calculations from composite survey data and engineering evaluation of literature data.

SCC Assignments: 50100202

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak
43121		ISOMERS OF PENTENE	70.13	11.80	
43203	74-85-1	ETHYLENE	28.05	19.40	
43204	74-98-6	PROPANE	44.09	1.90	
43206	74-86-2	ACETYLENE	26.04	1.90	
43212	106-97-8	N-BUTANE	58.12	1.90	
43213	106-98-9	BUTENE	56.10	5.90	
43214	75-28-5	ISO-BUTANE	58.12	1.90	
43220	109-66-0	N-PENTANE	72.15	1.90	
43224	109-67-1	1-PENTENE	70.13	11.80	
43231	110-54-3	HEXANE	86.17	13.90	
43232	142-82-5	HEPTANE	100.20	13.90	
43233	111-65-9	OCTANE	114.23	13.80	
TOTAL				100.00	

It should be noted that the particulate speciation profile is often related to a given size of particles (e.g. 0 - 2.5 μm), and the appropriate particulate emission should be used in the toxic emission calculation.

The major sources of speciation profiles are the U.S. EPA (U.S. EPA, 1991) and the California Air Resources Board (CARB, 1991). The number of available profiles is, however, significantly less than the number of types of emission sources, and as a result profiles are often allocated to sources based upon their general similarity, or else an "industry average" is used due to the lack of an otherwise suitable profile.

In light of the above, speciation profiles should generally only be used as indicative or screening tools, and should not be expected to give quantitative toxic emissions data of a high level of confidence.

2.2 EMISSION FACTORS

As for common pollutants, emission factors are used to calculate air toxic emissions by multiplying a base quantity by the emission factor appropriate to the particular source and toxic:

$$E_T = BQ \times E_{FT}$$

where E_T = emission of a given toxic
BQ = Base Quantity (amount of raw material used, product produced or fuel burned)
E_{FT} = emission factor for the given toxic

The potential number of emission factors is very high (e.g. for 500 toxic chemicals and 320 unique sources/SCC codes in B.C., the total is 500 x 320 = 160,000 emission factors).

The most comprehensive compilation of emission factors currently available is contained in the XATEF2 data base, as compiled by the U.S. EPA as a recent update to XATEF (Crosswalk Air Toxics Emission Factors). This contains approximately 7,000 emission factors originating from studies carried out by the U.S. EPA, as well as by other research and environmental groups around the world. XATEF2 includes factors published in a recent Canadian study (Ortech, 1991), as well as results from some initial "pooling" studies arising from toxic emission reports being filed with the California Air Resources Board.

XATEF and XATEF2 contain many replicates. That is, there are often several factors available for quantifying emissions of a specific chemical from a given source. Conversely, there are many source types (SCCs) for which no emission factors are available. The latter fact may be due to the lack of any relevant study, or that there are indeed no toxic emissions from the particular source type. This multiplicity of emission factors is shown in Appendix I, which is based upon the source categories used in the 1990 B.C. point source emissions inventory of common pollutants. For each SCC code, Appendix I gives all chemicals for which emission factors are available in XATEF, plus the number of replicate emission factors. In cases where a full 8 digit match of SCC codes could not be found, then the first 6 digits of the SCC are used to locate more generalised information from XATEF.

It can be seen that there are over 20 emission factors available in some cases. These factors can vary by as much as 5-fold.

XATEF2 contains short comments about each factor, which may allow a choice as to the most appropriate when several are available. This is particularly relevant as to the type of emission control equipment in use when emission factors were determined compared to those for the source being quantified. Failing this use can be made of the references also provided. A replacement to XATEF2, entitled FIRE (Factor Information Retrieval) is scheduled to be available from the EPA in October, 1993. FIRE will contain a recommended range of emission factors for each source/toxic chemical pair, as well as a data quality indicator. This will facilitate the use of the most appropriate factors, as well as give an indication of the degree of accuracy or level of confidence in the calculated emission.

In addition to reviewing and extracting data and information from XATEF (and its successor XATEF2), the present project undertook a literature search to identify sources of emission factors that were specific to sources within B.C., as well as recent studies that were not included in the original XATEF (e.g. Ortech, 1991). As mentioned above, however, the recently available (November 1992) XATEF2 contains an expanded data set, which covers all the significant references identified in this project, excluding some studies carried out specifically on B.C. emission sources together with some other relevant studies (Environment Canada, B.C. Ministry of Environment, 1989; Tam, P. and Edwards, W.C., 1992; Edwards, W.C., Cotton, T. and Tam, P., 1989; Knizek, O., 1992; Radke, L.F., 1990). Emission factors which were developed for B.C. sources from emissions studies or were extracted from relevant reports are given in Tables 5 to 8. These factors cover black liquor incineration at pulp mills, burning of chlorophenol contaminated woodwastes, municipal waste incineration at the GVRD Burnaby incinerator, and forest fires in

Washington and Oregon, and have been included with the XATEF2 factors in the inventory data base.

There are other potential sources of localized B.C. emission factors which can be incorporated into the data base as results become available. One such study is currently addressing the consumption and emissions from specific chlorinated solvents in B.C. for the year 1991. The relevance of the results from such studies is very dependent upon how recently the study was carried out and the rate of change of the associated atmospheric emissions with time. Thus, emissions of a chemical such as methyl chloroform, which has been targeted for complete phase-out, will be decreasing significantly on a year-to-year basis.

Emission estimates calculated using emission factors will typically have an accuracy of no better than ± 100%. Thus, as was pointed out above, emission factors for a given air toxic from a given source can vary by a factor of two or more. There will be cases, however, where an emission factor is very appropriate for a given source, and in those cases accuracies of ± 25% possible. It is thus very important to use the most relevant emission factor when several are available.

2.3 MASS BALANCES, ENGINEERING CALCULATIONS AND SOURCE MONITORING

Emissions calculations based upon regular source monitoring, or using known process stream composition and equipment operating performance are typically the preferred means of providing data for an emissions inventory. Such data is lacking however for toxic emissions in B.C., except in a few specific cases such as some metal emissions from smelting and refining operations. In such cases the emission estimates can be manually entered into the inventory system.

In some jurisdictions, for example California, operations which meet certain criteria are required to prepare toxic emissions estimates based upon calculations of this type. These estimates are submitted to the appropriate air quality agency who can then prepare an overall inventory with a high level of confidence. In addition, emission estimates from similar sources can be "pooled", and result in high quality emission factors, as mentioned above.

TABLE 5

AIR TOXIC EMISSION FACTORS

BURNING OF CHLOROPHENOL CONTAMINATED WOODWASTES
AT AN INTERIOR MILL

SCC = 10200902

POLLUTANT CAS #	NAME	EMISSION FACTOR	UNITS	NOTES
25167-80-0	chlorophenol	5.5000	mg/g chlorophenol burned	Input 6 g/h CP, 16 t/h hog fuel
25167-80-0	chlorophenol	0.0811	mg/g chlorophenol burned	Input 990 g/h CP, 16 t/h hog fuel
25167-80-0	chlorophenol	0.0364	mg/g chlorophenol burned	Input 7310 g/h CP, 16 t/h hog fuel
3268-87-9	dioxin O8CDD(1)	0	mg/g dioxin burned	Input 0.9 mg/h Dioxin, 16 t/h hog fuel
3268-87-9	dioxin O8CDD(1)	0	mg/g dioxin burned	Input 510 mg/h Dioxin, 16 t/h hog fuel
3268-87-9	dioxin O8CDD(1)	0.0065	mg/g dioxin burned	Input 3830 mg/h Dioxin, 16 t/h hog fuel
55722-27-5	furan T4CDF(2)	0	mg/g furan burned	Input 0 mg/h furan, 16 t/h hog fuel
55722-27-5	furan T4CDF(2)	0	mg/g furan burned	Input 1500 mg/h furan, 16 t/h hog fuel
55722-27-5	furan T4CDF(2)	0.0054	mg/g furan burned	Input 11200 mg/h furan, 16 t/h hog fuel

Notes: (1): Octachloro- was only dibenzodixin detected
(2): Tetrachloro- were only dibenzofurans detected

TABLE 6

AIR-TOXICS EMISSION FACTORS

KRAFT PULP MILL RECOVERY BOILER

SCC = 30700104

CONDITIONS: 31.3 kg/s black liquor @ 70.0% solids
113.8 Sm3/s stack gas
386,000 kg/h steam
hi-efficiency two-stage electrostatic precipitator

POLLUTANT		EMISSION FACTOR	UNITS
CAS #	NAME		
7440-36-0	antimony	1.5417	mg/t liquor burned
7440-38-2	arsenic	0.1100	mg/t liquor burned
7782-49-2	selenium	0.0000	mg/t liquor burned
7440-70-2	calcium	886.9612	mg/t liquor burned
7439-95-4	magnesium	203.2428	mg/t liquor burned
7429-90-5	aluminum	152.6023	mg/t liquor burned
7440-39-3	barium	3.7143	mg/t liquor burned
7440-42-8	boron	1212.4758	mg/t liquor burned
7440-43-9	cadmium	442.6685	mg/t liquor burned
7440-47-3	chromium	5.9092	mg/t liquor burned
7440-48-4	cobalt	1.1754	mg/t liquor burned
7440-50-8	copper	49.0424	mg/t liquor burned
15438-31-0	iron	406.3263	mg/t liquor burned
7439-92-1	lead	3.2934	mg/t liquor burned
7439-96-5	manganese	1377.1975	mg/t liquor burned
7439-98-7	molybdenum	7.5700	mg/t liquor burned
7440-02-0	nickel	3.3346	mg/t liquor burned
7440-28-0	thallium	0.0000	mg/t liquor burned
7440-62-2	vanadium	1.8404	mg/t liquor burned
7440-66-6	zinc	676.8951	mg/t liquor burned
13494-80-9	tellurium	0.0000	mg/t liquor burned
7439-97-6	mercury	2.6828	mg/t liquor burned
7647-01-0	hydrogen chloride	2.07	mg/t liquor burned
1746-01-6	2,3,7,8-T4CDD	0.00	ng/t liquor burned
40321-76-4	1,2,3,7,8-P5CDD	0.00	ng/t liquor burned
57653-85-7	1,2,3,4,7,8-H6CDD	0.00	ng/t liquor burned
34465-46-8	1,2,3,6,7,8-H6CDD	53.19	ng/t liquor burned
19408-74-3	1,2,3,7,8,9-H6CDD	0.00	ng/t liquor burned
TEMP-00-1	1,2,3,4,6,7,8-H7CDD	328.67	ng/t liquor burned
3268-87-9	O8CDD	787.09	ng/t liquor burned
TEMP-00-3	1,2,3,7,8-P5CDF	0.00	ng/t liquor burned
57117-31-4	2,3,4,7,8-P5CDF	0.00	ng/t liquor burned
TEMP-00-4	1,2,3,4,7,8-H6CDF	21.19	ng/t liquor burned
TEMP-00-5	1,2,3,6,7,8-H6CDF	0.00	ng/t liquor burned
TEMP-00-6	1,2,3,7,8,9-H6CDF	0.00	ng/t liquor burned
TEMP-00-7	2,3,4,6,7,8-H6CDF	0.00	ng/t liquor burned
TEMP-00-8	1,2,3,4,6,7,8-H7CDF	97.30	ng/t liquor burned
TEMP-00-9	2,3,4,6,7,8,9-H7CDF	0.00	ng/t liquor burned

TABLE 6(cont.)

AIR-TOXICS EMISSION FACTORS

KRAFT PULP MILL RECOVERY BOILER

SCC = 30700104

CONDITIONS: 31.3 kg/s black liquor @ 70.0% solids
113.8 Sm3/s stack gas
386,000 kg/h steam
hi-efficiency two-stage electrostatic precipitator

POLLUTANT		EMISSION FACTOR	
CAS #	NAME		
39001-02-0	O8CDF	0.00	ng/t liquor burned
TEMP-01-0	dichlorobiphenyls	0.00	ng/t liquor burned
TEMP-01-1	trichlorobiphenyls	0.00	ng/t liquor burned
26914-33-0	tetrachlorobiphenyls	0.00	ng/t liquor burned
25429-29-2	pentachlorobiphenyls	0.00	ng/t liquor burned
26601-64-9	hexachlorobiphenyls	14.39	ng/t liquor burned
28655-71-2	heptachlorobiphenyls	0.00	ng/t liquor burned
TEMP-01-2	octachlorobiphenyls	0.00	ng/t liquor burned
TEMP-01-3	nonachlorobiphenyls	0.00	ng/t liquor burned
TEMP-01-4	decachlorobiphenyls	0.00	ng/t liquor burned
208-96-8	acenaphthylene	0.00	ng/t liquor burned
83-32-9	acenaphthene	0.00	ng/t liquor burned
86-73-7	fluorene	0.00	ng/t liquor burned
TEMP-01-5	2-methyl-fluorene	12.65	ng/t liquor burned
85-01-8	phenanthrene	5.20	ng/t liquor burned
120-12-7	anthracene	0.00	ng/t liquor burned
206-44-0	fluoranthene	0.00	ng/t liquor burned
129-00-0	pyrene	0.00	ng/t liquor burned
30777-18-5	benzo(a)fluorene	0.00	ng/t liquor burned
TEMP-01-6	benzo(b)fluorene	0.00	ng/t liquor burned
TEMP-01-7	1-methyl-pyrene	0.00	ng/t liquor burned
TEMP-09-6	benzo(g,h,i)fluoranthene	0.00	ng/t liquor burned
56-55-3	benzo(a)anthracene	0.00	ng/t liquor burned
TEMP-04-4	chrysene & triphenylene	0.00	ng/t liquor burned
TEMP-01-8	7-methyl-benzo(a)anthracene	0.00	ng/t liquor burned
TEMP-01-9	benzo(b&k)fluoranthene	0.00	ng/t liquor burned
192-97-2	benzo(e)pyrene	0.00	ng/t liquor burned
50-32-8	benzo(a)pyrene	0.00	ng/t liquor burned
198-55-0	perylene	0.00	ng/t liquor burned
TEMP-02-0	2-methyl-cholanthrene	0.00	ng/t liquor burned
193-39-5	indeno(1,2,3-cd)pyrene	0.00	ng/t liquor burned
TEMP-05-0	dibenzo(a,c)&(a,h)anthracene	0.00	ng/t liquor burned
TEMP-02-1	benzo(b)chrysene	0.00	ng/t liquor burned
191-24-2	benzo(g,h,i)perylene	0.00	ng/t liquor burned
TEMP-02-2	anthanthrene	0.00	ng/t liquor burned
541-73-1	1,3-dichlorobenzene	0.00	ng/t liquor burned
106-46-7	1,4-dichlorobenzene	0.00	ng/t liquor burned

TABLE 6(cont.)

AIR-TOXICS EMISSION FACTORS

KRAFT PULP MILL RECOVERY BOILER

SCC = 30700104

CONDITIONS: 31.3 kg/s black liquor @ 70.0% solids
113.8 Sm3/s stack gas
386,000 kg/h steam
hi-efficiency two-stage electrostatic precipitator

POLLUTANT		EMISSION FACTOR	UNITS
CAS #	NAME		
95-50-1	1,2-dichlorobenzene	0.00	ng/t liquor burned
108-70-3	1,3,5-trichlorobenzene	0.00	ng/t liquor burned
120-82-1	1,2,4-trichlorobenzene	0.00	ng/t liquor burned
87-61-6	1,2,3-trichlorobenzene	0.00	ng/t liquor burned
634-90-2	1,2,3,5-tetrachlorobenzene	0.00	ng/t liquor burned
95-94-3	1,2,4,5-tetrachlorobenzene	0.00	ng/t liquor burned
634-66-2	1,2,3,4-tetrachlorobenzene	0.00	ng/t liquor burned
608-93-5	pentachlorobenzene	0.00	ng/t liquor burned
118-74-1	hexachlorobenzene	0.00	ng/t liquor burned
TEMP-02-3	2,6-dichlorophenol	0.00	ng/t liquor burned
120-83-2	2,4-+2,5-dichlorophenol	128.50	ng/t liquor burned
TEMP-02-4	3,5-dichlorophenol	0.00	ng/t liquor burned
TEMP-02-5	2,3-dichlorophenol	0.00	ng/t liquor burned
TEMP-02-6	3,4-dichlorophenol	47.24	ng/t liquor burned
88-06-2	2,4,6-trichlorophenol	47.68	ng/t liquor burned
TEMP-02-7	2,3,6-trichlorophenol	0.00	ng/t liquor burned
TEMP-02-8	2,3,5-trichlorophenol	0.00	ng/t liquor burned
95-95-4	2,4,5-trichlorophenol	18.75	ng/t liquor burned
TEMP-02-9	2,3,4-trichlorophenol	12.28	ng/t liquor burned
TEMP-03-0	3,4,5-trichlorophenol	4.51	ng/t liquor burned
TEMP-03-1	2,3,5,6-tetrachlorophenol	0.00	ng/t liquor burned
58-90-2	2,3,4,6-tetrachlorophenol	58.00	ng/t liquor burned
4901-51-3	2,3,4,5-tetrachlorophenol	0.00	ng/t liquor burned
87-86-5	pentachlorophenol	90.49	ng/t liquor burned
74-87-3	chloromethane	0.00	ng/t liquor burned
74-83-9	bromomethane	0.00	ng/t liquor burned
75-01-4	vinyl chloride	0.00	ng/t liquor burned
75-00-3	chloroethane	0.00	ng/t liquor burned
TEMP-03-2	1,1-dichloroethylene	0.00	ng/t liquor burned
156-60-5	trans-1,2-dichloroethylene	0.00	ng/t liquor burned
75-09-2	methylene chloride	0.00	ng/t liquor burned
67-66-3	chloroform	0.00	ng/t liquor burned
75-34-3	1,1-dichloroethane	0.00	ng/t liquor burned
107-06-2	1,2-dichloroethane	0.00	ng/t liquor burned
56-23-5	carbon tetrachloride	0.00	ng/t liquor burned
71-55-6	1,1,1-trichloroethane	0.00	ng/t liquor burned
67-64-1	acetone	0.00	ng/t liquor burned

TABLE 6(cont.)

AIR-TOXICS EMISSION FACTORS

KRAFT PULP MILL RECOVERY BOILER

SCC = 30700104

CONDITIONS: 31.3 kg/s black liquor @ 70.0% solids
113.8 Sm3/s stack gas
386,000 kg/h steam
hi-efficiency two-stage electrostatic precipitator

POLLUTANT		EMISSION FACTOR	UNITS
CAS #	NAME		
75-15-0	carbon disulfide	0.00	ng/t liquor burned
108-05-4	vinyl acetate	0.00	ng/t liquor burned
TEMP-03-6	2-butanone	0.00	ng/t liquor burned
75-27-4	bromodichloromethane	0.00	ng/t liquor burned
79-00-5	1,1,2-trichloroethane	0.00	ng/t liquor burned
TEMP-03-7	cis-1,3-dichloropropylene	0.00	ng/t liquor burned
TEMP-03-8	trans-1,3-dichloropropylene	0.00	ng/t liquor burned
78-87-5	1,2-dichloropropane	0.00	ng/t liquor burned
124-48-1	chlorodibromomethane	0.00	ng/t liquor burned
79-01-6	trichloroethylene	0.00	ng/t liquor burned
75-25-2	bromoform	0.00	ng/t liquor burned
127-18-4	tetrachloroethylene	0.00	ng/t liquor burned
79-34-5	1,1,2,2-tetrachloroethane	0.00	ng/t liquor burned
108-90-7	chlorobenzene	0.00	ng/t liquor burned
71-43-2	benzene	0.00	ng/t liquor burned
108-88-3	toluene	0.00	ng/t liquor burned
100-41-4	ethylbenzene	0.00	ng/t liquor burned
TEMP-05-1	m+p-xylenes	0.00	ng/t liquor burned
100-42-5	styrene	0.00	ng/t liquor burned
TEMP-03-9	4-methyl-2-pentanone	0.00	ng/t liquor burned
TEMP-04-0	2-hexanone	0.00	ng/t liquor burned

TABLE 7

AIR TOXIC EMISSION FACTORS

BURNABY WASTE INCINERATOR

SCC = 50100101

CONDITIONS: Feed rate = 10 tonne/hour to each unit
Flue gas flow = 55000 cubic metres/hour from each unit

POLLUTANT		EMISSION FACTOR	UNITS
CAS #	NAME		
1336-36-3	polychlorinated biphenyls (PCB)	0.0	ug/Te waste burned
TEMP-04-2	chlorobenzenes	2717.0	ug/Te waste burned
TEMP-04-3	chlorophenols	5775.0	ug/Te waste burned
1746-01-6	2,3,7,8 TCDD	0.0	ng/Te waste burned
40321-76-4	1,2,3,7,8 PCDD	0.0	ng/Te waste burned
57653-85-7	1,2,3,4,7,8 HxCDD	0.0	ng/Te waste burned
34465-46-8	1,2,3,6,7,8 HxCDD	5.5	ng/Te waste burned
19408-74-3	1,2,3,7,8,9 HxCDD	0.0	ng/Te waste burned
TEMP-00-8	1,2,3,4,6,7,8 HpCDD	55.0	ng/Te waste burned
39001-02-0	1,2,3,4,6,7,8,9 OCDD	0.0	ng/Te waste burned
TEMP-00-2	2,3,7,8 TCDF	88.0	ng/Te waste burned
TEMP-00-3	1,2,3,7,8 PCDF	0.0	ng/Te waste burned
57117-31-4	2,3,4,7,8 PCDF	0.0	ng/Te waste burned
TEMP-00-4	1,2,3,4,7,8 HxCDF	49.5	ng/Te waste burned
TEMP-00-6	1,2,3,7,8,9 HxCDF	16.5	ng/Te waste burned
TEMP-00-5	1,2,3,6,7,8 HxCDF	0.0	ng/Te waste burned
TEMP-00-7	2,3,4,6,7,8 HxCDF	0.0	ng/Te waste burned
TEMP-00-8	1,2,3,4,6,7,8 HpCDF	110.0	ng/Te waste burned
TEMP-10-1	1,2,3,4,7,8,9 HpCDF	0.0	ng/Te waste burned
39001-02-0	1,2,3,4,6,7,8,9 OCDF	0.0	ng/Te waste burned
208-96-8	acenaphthylene	247.5	ug/Te waste burned
83-32-9	acenaphthene	77.0	ug/Te waste burned
86-73-7	fluorene	132.0	ug/Te waste burned
85-01-8	phanathrene	5593.5	ug/Te waste burned
120-12-7	anthracene	1012.0	ug/Te waste burned
206-44-0	fluoranthene	4356.0	ug/Te waste burned
129-00-0	pyrene	4532.0	ug/Te waste burned
56-55-3	benzo(a)anthracene	154.0	ug/Te waste burned
218-01-9	chrysene	170.5	ug/Te waste burned
TEMP-04-5	benzo(b,k)fluoranthene	82.5	ug/Te waste burned
192-97-2	benzo(e)pyrene	60.5	ug/Te waste burned
50-32-8	benzo(a)pyrene	22.0	ug/Te waste burned
198-55-0	perylene	0.0	ug/Te waste burned
193-39-5	indeno(1,2,3-cd)pyrene	16.5	ug/Te waste burned
53-70-3	dibenz(a,b)anthracene	0.0	ug/Te waste burned
191-24-2	benzo(g,h,i)perylene	165.0	ug/Te waste burned

TABLE 7 (cont.)

AIR TOXIC EMISSION FACTORS

BURNABY WASTE INCINERATOR

SCC = 50100101

CONDITIONS: Feed rate = 10 tonne/hour to each unit
Flue gas flow = 55000 cubic metres/hour from each unit

POLLUTANT		EMISSION FACTOR	UNITS
CAS #	NAME		
7440-43-9	cadmium	16.3	mg/Te waste burned
7439-97-6	mercury	353.0	mg/Te waste burned
7440-28-0	thallium	0.0	mg/Te waste burned
7440-38-2	arsenic	4.7	mg/Te waste burned
7440-48-4	cobalt	1.0	mg/Te waste burned
7440-02-0	nickel	107.3	mg/Te waste burned
7782-49-2	selenium	11.6	mg/Te waste burned
13494-80-9	tellurium	0.0	mg/Te waste burned
7440-36-0	antimony	116.1	mg/Te waste burned
7439-92-1	lead	148.0	mg/Te waste burned
7440-47-3	chromium	63.9	mg/Te waste burned
7440-50-8	copper	0.0	mg/Te waste burned
7439-96-5	manganese	42.2	mg/Te waste burned
7440-62-2	vanadium	0.0	mg/Te waste burned
7440-66-6	zinc	563.6	mg/Te waste burned

TABLE 8

AIR TOXIC EMISSION FACTORS

FOREST FIRES

SCC = 50300201

POLLUTANT		EMISSION FACTOR	UNITS
CAS #	NAME		
TEMP-07-8	particulate matter - forest fires	12.2 (+/- 3.5)	kg/tonne burned

3. POLLUTANTS AND SOURCES TO BE COVERED

3.1 POLLUTANTS

Pollutant lists can be "open-ended" or "directed". That is, they can be designed so that data will be accepted on any chemical, or they can be limited to specific chemicals which are of particular interest. There are advantages and disadvantages to both approaches, but since the potential number of chemicals is several thousand and the associated data collection and data processing needs would be counterproductive, it is recommended that a directed list be used.

It should be noted, however, that the use of a computer-based inventory system enables the use of a relatively long list, which can be extended as relevant data and information become available.

3.1.1 Recommended List

The members of a list of chemicals used in environmental studies are typically chosen with regard to the objectives of the particular study. Thus, a project concerned with environmental emissions in an agricultural area will tend to focus on fertilizers, herbicides, pesticides, etc. The atmospheric emissions inventory for air toxics following upon this study has no such industry sector or narrow geographical focus, and is intended to cover emissions from all anthropogenic sources, plus forest fires, in B.C. Moreover, it is intended that the inventory system should be capable of later use anywhere in Canada.

In light of the above, the following criteria have been used to develop the list of chemicals:

- has been identified as being used or produced in Canada above a threshold level;
- has been identified as a chemical of concern in Canada because of its potential toxic effects;
- data is available which allows the calculation of atmospheric emissions of the chemical from one or more sources.

A list of chemicals meeting one or more of the above criteria can be produced by combining chemical lists from three main sources:

1. The proposed NPRI (National Pollutant Release Inventory) list, plus the associated list of candidate substances for addition. All chemicals in these lists have been identified in Canadian commerce in amounts over 1,000 kg per year. The proposed NPRI list is based on the Toxics Release Inventory (TRI) as produced in the U.S., while the candidate list covers additional substances present on two or more of the following lists:

   - CEPA Priority Substances List, 1988
   - Federal-Provincial Advisory Committee on Air Quality List, 1989
   - Great Lakes Water Quality Agreement (GLWQA), Annex 1
   - Great Lakes Water Quality Agreement (GLWQA), Annex 10
   - Ontario Ministry of the Environment MISA List (EMPPL), 1988
   - CCME Interim Assessment Criteria for Contaminated Sites List
   - Ontario Ministry of the Environment Clean Air Program List
   - IJC Working List of Chemicals in the Great Lakes Basin, 1986
   - Major Industrial Accident Coordinating Committee Interim List
   - U.S. EPA Superfund Chemicals List.

2. A list compiled by Environment Canada, Conservation and Protection, Ontario Region, which was derived from the following lists:

   - CEPA Priority Substance List
   - CEPA Schedule 1
   - Primary list of substances for ban or phase-out (MOE)
   - Secondary list for ban or phase-out (MOE)
   - IJC critical pollutants list
   - Great Lakes Water Quality Agreement (1989) Annex 1, List 1
   - Great Lakes Water Quality Agreement (1989) Annex 15.

3. Those substances included in XATEF2 (Crosswalk Air Toxics Emissions Factors) as compiled by the U.S. EPA. Atmospheric emissions of the chemicals included in this list have been identified, and, in most cases, quantified, in association with the cross-referenced sources.

The chemicals from these three lists have been combined into one list, with the following corrections:

- the common pollutants (CO, NO_x, particulate, SO_x, VOCs) have been omitted, with the exception of particulate from forest fires;
- CO_2 and methane have been omitted
- CFCs have been omitted.

To this combined list have been added any additional chemicals from Tables 5, 6, 7 and 8. The resulting list contains 572 chemicals, and is given in Appendix II.

As discussed above (Section 2), the prime method of estimating the emissions of air-toxics will be by using emission factors, and the Appendix II list indicates those chemicals for which emission factors are available.

Thus, although the Appendix II list is the preferred master-list of air-toxics to be inventoried, in practice emissions of only 348 of these chemicals can be estimated by the use of emission factors.

It should be noted that unique temporary CAS numbers have been assigned to chemicals whose CAS number was not available from the reference source. These temporary CAS numbers are of the general format: TEMP-XX-X, where X = a single digit from 0 to 9.

3.1.2 Chemical Groupings

It is often convenient to refer to the class or group of chemicals to which a particular toxic belongs, rather than identify the chemical fully. Examples of this are:

- specific chemical: benzo(j)fluoranthene
  chemical group: polyaromatic hydrocarbons (PAHs)

- specific chemical: 1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
  chemical group: dioxins

- specific chemical: 2',3,4-trichloro-1,1'-biphenyl
  chemical group: polychlorinated biphenyls (PCBs)

The advantages of using the group name or abbreviation include ease of communication, as well as identification for people with a relatively small chemical background. However, the various isomers, homologues and congeners in each of these chemical groups can have greatly different toxicity ratings, and in order to correctly quantify the toxicity of an emission of one or more members of a group, the size of the emission of each individual chemical must be known. In instances where only total group emissions are known, it is often the practice to calculate the toxicity of the emission based upon the toxicity of the most toxic member of the group. This "conservative" approach is advisable where no other data is available, but can lead to over-estimates of the toxicity of an emission, and therefore, a possible over-reaction.

Emissions of dioxins and furans are often reported as "toxic-equivalent" emissions, whereby each emission is given as the equivalent amount of the most toxic isomer. This requires that all reporting and monitoring agencies use the same set of toxic equivalencies, which has not always been the case.

In light of the above discussion, it is recommended that chemicals be identified wherever possible on an individual basis, not as part of a class or grouping, and that toxicity ratings or equivalencies be part of a separate exercise. The generic group names will have to be retained in the list of toxics, however, as much available data refers to groups and not to the individual chemicals.

Lists of PCBs, PAHs, dioxins and furans included in the main list of Appendix II are given in Appendix III. The list of PAHs includes all of those identified in a recent study of Canadian PAH emissions (SNC, 1991).

3.2 SOURCES

Emissions of air toxics generally originate from the same types of sources and source categories as common atmospheric pollutants. This is because most air toxics are a subset of either particulate matter or volatile organic compounds (VOCs) (see Section 2.1). For this reason, the sources covered in a complete common pollutant inventory provide a good basis for an air toxics inventory. It should be noted, however, that not every source will emit toxic compounds.

3.2.1 General Categories

Notwithstanding the above, it is possible to group the sources into generic categories that typically account for a large fraction of total air toxic emissions (U.S. EPA, 1990):

- SOCMI (Synthetic Organic Chemical Manufacturing Industry)
- solvent evaporation (surface coating, degreasing, printing, etc.)
- stationary fuel combustion (boilers, internal combustion engines)
- metal processing (mining, refining, production of metals and metal products)
- mobile sources (automobiles, boats, planes, etc.)
- miscellaneous (non-traditional) sources.

The significance of each of these is briefly discussed below.

3.2.1.1 SOCMI (Synthetic Organic Chemical Manufacturing Industry)

This category includes not only facilities which produce synthetic organic chemicals (petrochemical and specialty chemical plants), but also those that use these chemicals as feedstock (plastics manufacturing, specialty products, formulation plants, etc.) as well as those that produce the chemicals indirectly as contaminants or byproducts (natural gas processing, petroleum refining, etc.). For many of the toxic chemicals, this category represents the only major type of source.

3.2.1.2 Solvent Evaporation

Solvent use accounts for the major release of several substances, e.g. cyclohexane, methyl ethyl ketone, chlorobenzene, nitrobenzene, perchloroethylene, trichloroethylene, methyl chloroform, etc. These emissions arise from evaporation during surface coating, degreasing, dry cleaning, etc. and the contributions of small point and area sources are significant.

3.2.1.3 Stationary Fuel Combustion

This category can be the largest source of PAHs and several metals. The total volume of atmospheric emissions can vary widely between different sources (e.g. thermal power plants and residential wood stoves), yet the smaller sources are typically the most important sources of PAHs.

3.2.1.4 Metal Processing

This category covers emissions from mining, refining and the production of alloy and metal products, including chrome plating, and is therefore, a major source of the relevant metals: zinc, manganese, copper, cadmium, nickel, lead, chromium, etc.

3.2.1.5 Mobile Sources

Tailpipe emissions, together with evaporative emissions from gasoline-powered vehicles typically account for a large fraction of benzene, toluene, xylene, PAH and formaldehyde emissions. Diesel particulate contains significant amounts of nitrated organic matter.

3.2.1.6 Miscellaneous (Non-Traditional) Sources

This category includes those sources that are not normally included in common pollutant emission inventories, but which may be significant as sources of air toxics. Potentially important sources include:

- publicly-owned treatment works (POTWs) or municipal sewage treatment plants;
- treatment, storage and disposal facilities (TSDFs) which handle wastes, e.g. landfills, land treatment, waste piles, unloading and storage, etc.;
- waste oil combustion.

3.2.2 Recommended List

In order to parallel the national inventory of emissions of common pollutants, the sources of air toxics briefly discussed above can be allocated to the following categories:

- industrial
- fuel combustion
- transportation
- incineration
- miscellaneous.

The sectors of interest within each category include those used for common pollutant emission estimates, plus those additional sources which are associated with air toxic emissions but have not been specifically inventoried for common pollutants in B.C. Table 9 gives such a combined list and this is the recommended list of categories and sectors for the toxics emission inventory.

The detailed list of sources for B.C. would thus include all point sources permitted for air discharge, plus area and mobile sources, as well as waste storage, treatment and disposal facilities. This last group would cover municipal waste incinerators, as well as facilities such as hospitals and airports where localized waste treatment and incineration occurs.

TABLE 9 CATEGORIES AND SECTORS FOR A TOXICS EMISSIONS INVENTORY

Category	Sector
INDUSTRIAL	**Mining and Metal Refining** Iron Aluminum Copper and Nickel Lead and Zinc Gold Asbestos Quarries **Alloys and Metal Products** Ferroalloys Chrome Plating Other **Hydrocarbon Recovery and Processing** Oil and Gas Wells Oil Refineries Gas Processing Plants Coal Production and Processing **Chemical Manufacture, Processing and Formulation** Petrochemicals Specialty Chemicals Plastics Formulated products **Forest Products** Wood Pulping Wood Products **Other** Asphalt Paving
FUEL COMBUSTION	**Stationary** Oil Refineries, Gas Plants, Chemical Plants Other Industrial Commercial Residential Fuel Wood **Power Plants** Utilities Other

TABLE 9 CATEGORIES AND SECTORS FOR A TOXICS EMISSIONS INVENTORY (CONTINUED)

Category	Sector
TRANSPORTATION	**On-road Gasoline**
	Cars
	L-D Trucks
	H-D Trucks
	Motorcycles
	On-road Diesel
	Cars
	L-D Trucks
	H-D Trucks
	Railroads
	Marine
	Aircraft
	Off-Road Gas
	Tire Wear
INCINERATION	Wood Waste
	Waste Oil
	Other
MISCELLANEOUS	Fuel Marketing
	Structural Fires
	Pesticide Use
	Forest Fires/Slash Burning
	Solvent Use
	Dry Cleaning
	Surface Coatings
	General Use
	Publicly Owned Treatment Works
	Treatment, Storage and Disposal Facilities
	Other

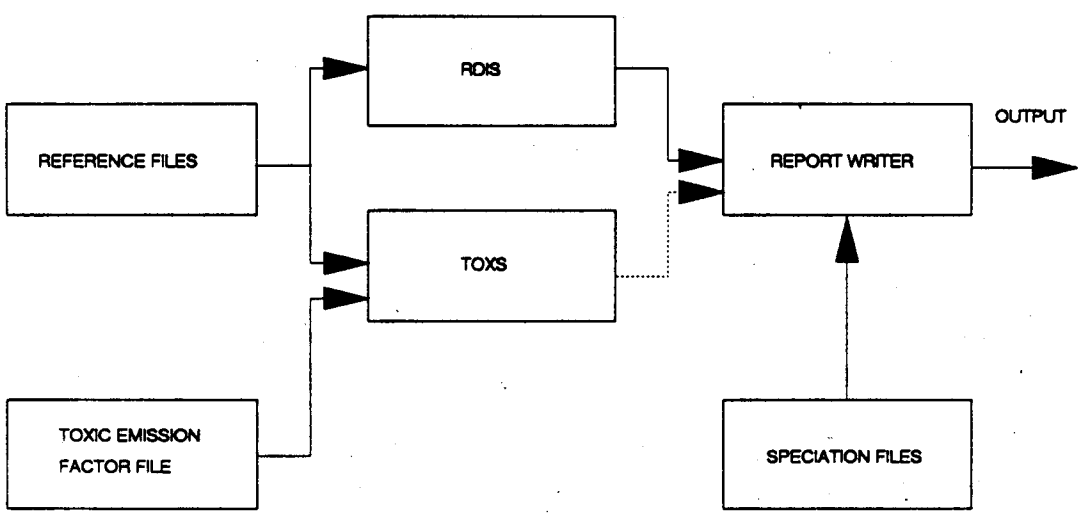
4. SOFTWARE AND DATA BASE DESIGN

4.1 DESIGN OVERVIEW

The data system for producing the air toxics emissions inventory, TOXS, has been designed with the following features:

- menu driven;
- stand-alone system using base quantity and coded data from RDIS reference files;
- calculates toxic emission estimates using emission factors and base quantity data;
- allows manual entry of emission estimates as an alternative to emission factor calculation;
- allows separate estimates of toxic emissions to be produced using speciation factors plus total particulate or VOC emissions. This is provided as an option through Report Writer™ software, and thus avoids double-counting of emissions;
- the emission factor files contain data converted from XATEF2 files, plus emission factors generated as part of this study;
- speciation makes use of unaltered U.S. EPA SPECIATE data files.

The general flow of data in the operation of TOXS is shown below:



A full description of file structures and system design is given in the operating manual.

4.2 OPERATION OVERVIEW

In order to add a new source to the toxics process file and to estimate associated air toxic emissions, TOXS initially requires the unique source identifier code. This identifier code can be either entered directly, or obtained interactively from RDIS. Using this source identifier code, base quantity data and the source classification code (SCC) are then obtained automatically from RDIS and displayed.

Using the SCC from RDIS, or a user-defined SCC, TOXS indicates the number of air toxics for which emission factors are available. This number is provided both for air toxic emission factors associated with the full 8-digit SCC, and emission factors associated with only the first six digits of the SCC. The user then chooses which set of emission factors to use, or alternatively to enter another user-defined SCC and repeat the procedure of displaying the number of available emission factors.

Having identified which set of air toxic emission factors to use, TOXS displays the list of emission factors and the user chooses which specific air toxics will be quantified and by which emission factors. This choice can be facilitated by displaying comments associated with each emission factor, plus the identifier code of the source reference.

For each chosen air toxic, TOXS then displays the related emission factor and units, and asks the user which base quantity to use:

- RDIS process base quantity
- RDIS fuel base quantity
- user-defined base quantity.

Alternatively, the user at this point can choose to manually enter an emission estimate.

The emission calculation assumes that all emission factors have been developed for uncontrolled emission sources, and applies the VOC or particulate control efficiency that had previously been accepted from RDIS, or overwritten by the user. The choice between VOC or particulate control efficiency is made on the basis of a code associated with each air toxic in the appropriate reference file.

After emission estimates for each chosen air toxics are calculated, the user can proceed to quantify emissions from another source. Alternatively, other options are available for reviewing data, changing data, or exiting the system.

4.3 FUTURE REFINEMENT AND ENHANCEMENT

TOXS has been developed with the assumption that calculated air toxic emission estimates will be in uniform units of kilograms, and that emission factors are provided on an uncontrolled emission basis. However, because most of the TOXS emission factors were obtained from U.S. EPA XATEF2 files, neither of these assumptions is universally true. Thus, users of the present version of TOXS must be particularly careful to allow for these inconsistencies when carrying out emission estimates.

In order to simplify future use and make TOXS more generally applicable, the following refinements to the emission factor file should be carried out:

- convert emission factors to units of kilograms per unit of base quantity;
- convert those emission factors developed on a controlled emission basis to uncontrolled emission factors.

These two refinements can be carried out selectively: not all emission factors need be converted at once. Thus, when carrying out an air toxics emissions inventory, prior selection of the emission factors would obviate the need to examine and convert the entire emission factor file.

Alternatively, all emission factors pertaining to controlled emission sources could be deleted from the emission factor file, or made inaccessible until converted.

It is possible to develop a dBase™ program which would convert all emission factor units to the required kilograms per unit of base quantity. This program could be developed and used as part of the next phase of this air toxics emissions project.

The above comments illustrate the fact that the TOXS system will benefit from continuing general simplification and refinement. This will be particularly true when the U.S. EPA issues the new FIRE toxic emission factor system.

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APPENDIX I

SCC CODES (B.C. 1990 POINT SOURCES) WITH ASSOCIATED AIR TOXICS AND NUMBER OF EMISSION FACTORS IN XATEF

SCC CODE with associated POLLUTANTS	NO. OF EMISSION FACTORS

10100501 EXTCOMB BOILER ELECTRIC GENERATN DISTILLATE OIL NO 1 AND NO 2 OIL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

10101002 EXTCOMB BOILER ELECTRIC GENERATN LIQ PETROLEUM GAS PROPANE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

10200401 EXTCOMB BOILER INDUSTRIAL RESIDUAL OIL NO 6 OIL
8-DIGIT SCC-CODE MATCH

Polycyclic organic matter	2 EM. FACT(S). IN XATEF

10200501 EXTCOMB BOILER INDUSTRIAL DISTILLATE OIL NO 1 AND NO 2 OIL
6-DIGIT SCC-CODE MATCH 102005

Benzo(a)pyrene	1 EM. FACT(S). IN XATEF
Lead	1 EM. FACT(S). IN XATEF
Fluoranthene	1 EM. FACT(S). IN XATEF
Pyrene	1 EM. FACT(S). IN XATEF

10200504 EXTCOMB BOILER INDUSTRIAL DISTILLATE OIL NO 4 OIL
6-DIGIT SCC-CODE MATCH 102005 SEE ABOVE

10200601 EXTCOMB BOILER INDUSTRIAL NATURAL GAS >100MMBTU/HR
8-DIGIT SCC-CODE MATCH

Ammonia	1 EM. FACT(S). IN XATEF
Polycyclic organic matter	2 EM. FACT(S). IN XATEF

10200691 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 102006

Benzene	1 EM. FACT(S). IN XATEF
Benzo(a)pyrene	1 EM. FACT(S). IN XATEF
Formaldehyde	2 EM. FACT(S). IN XATEF
Fluoranthene	1 EM. FACT(S). IN XATEF
Phenanthrene	1 EM. FACT(S). IN XATEF
Pyrene	1 EM. FACT(S). IN XATEF
Carbazole	1 EM. FACT(S). IN XATEF

10200692 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 102006 SEE ABOVE

10200693 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 102006 SEE ABOVE

10200904 EXTCOMB BOILER INDUSTRIAL WOOD/BARK WASTE BARK<50K LB STEAM
6-DIGIT SCC-CODE MATCH 102009

Anthracene	1 EM. FACT(S). IN XATEF
Benzo(a)pyrene	1 EM. FACT(S). IN XATEF
Formaldehyde	2 EM. FACT(S). IN XATEF
Manganese	1 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzo-p-dioxin	2 EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	2 EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Polychlorinated dibenzofurans, total	1 EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Hexachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Hexachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF

Heptachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Pentachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Octachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Pentachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Octachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Benz(a)anthracene	1 EM. FACT(S). IN XATEF
Benzo(k)fluoranthene	1 EM. FACT(S). IN XATEF
Benzo(ghi)perylene	1 EM. FACT(S). IN XATEF
Chrysene	1 EM. FACT(S). IN XATEF
Dibenz(a,h)anthracene	1 EM. FACT(S). IN XATEF
Fluoranthene	1 EM. FACT(S). IN XATEF
Fluorene	1 EM. FACT(S). IN XATEF
Indeno(1,2,3-cd)pyrene	1 EM. FACT(S). IN XATEF
Phenanthrene	1 EM. FACT(S). IN XATEF
Pyrene	1 EM. FACT(S). IN XATEF
Benzo(b)fluoranthene	1 EM. FACT(S). IN XATEF
Benzo(e)pyrene	1 EM. FACT(S). IN XATEF
Cyclopenta(cd)pyrene	1 EM. FACT(S). IN XATEF
Methylphenanthrenes	1 EM. FACT(S). IN XATEF
Perylene	1 EM. FACT(S). IN XATEF
Primary sulfate	1 EM. FACT(S). IN XATEF

10200905 EXTCOMB BOILER INDUSTRIAL WOOD/BARK WASTE WOOD/BARK<50K STM
6-DIGIT SCC-CODE MATCH 102009 SEE ABOVE

10200906 EXTCOMB BOILER INDUSTRIAL WOOD/BARK WASTE WOOD<50K LB STEAM
8-DIGIT SCC-CODE MATCH

Anthracene	1 EM. FACT(S). IN XATEF
Barium	3 EM. FACT(S). IN XATEF
Chromium	3 EM. FACT(S). IN XATEF
Cobalt	2 EM. FACT(S). IN XATEF
Copper	3 EM. FACT(S). IN XATEF
Lead	3 EM. FACT(S). IN XATEF
Naphthalene	2 EM. FACT(S). IN XATEF
Phosphorus (yellow or white)	3 EM. FACT(S). IN XATEF
Silver	3 EM. FACT(S). IN XATEF
Phenol	3 EM. FACT(S). IN XATEF
Acenaphthene	3 EM. FACT(S). IN XATEF
Acenaphthylene	1 EM. FACT(S). IN XATEF
Benzo(k)fluoranthene	1 EM. FACT(S). IN XATEF
Chrysene	1 EM. FACT(S). IN XATEF
Fluoranthene	3 EM. FACT(S). IN XATEF
Phenanthrene	3 EM. FACT(S). IN XATEF
Pyrene	3 EM. FACT(S). IN XATEF
Nickel	3 EM. FACT(S). IN XATEF
Iron	3 EM. FACT(S). IN XATEF
Potassium	3 EM. FACT(S). IN XATEF
Sodium	2 EM. FACT(S). IN XATEF

10200992 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 102009 SEE ABOVE

10200996 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 102009 SEE ABOVE

10200998 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 102009 SEE ABOVE

10201001 EXTCOMB BOILER INDUSTRIAL LIQ PETROLEUM GAS BUTANE

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          NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

10201002  EXTCOMB BOILER INDUSTRIAL LIQ PETROLEUM GAS PROPANE
          NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

10300501  EXTCOMB BOILER COMMERCL-INSTUTNL DISTILLATE OIL NO 1 AND NO 2 OIL
          8-DIGIT SCC-CODE MATCH
       Polycyclic organic matter                          4 EM. FACT(S). IN XATEF

10300691  SCC DESCRIPTION NOT FOUND IN XATEF
          6-DIGIT SCC-CODE MATCH   103006
       Formaldehyde                                       2 EM. FACT(S). IN XATEF
       Mercury                                            1 EM. FACT(S). IN XATEF
       Acenaphthylene                                     1 EM. FACT(S). IN XATEF
       Fluoranthene                                       1 EM. FACT(S). IN XATEF

10300692  SCC DESCRIPTION NOT FOUND IN XATEF
          6-DIGIT SCC-CODE MATCH   103006    SEE ABOVE

10300693  SCC DESCRIPTION NOT FOUND IN XATEF
          6-DIGIT SCC-CODE MATCH   103006    SEE ABOVE

10300903  EXTCOMB BOILER COMMERCL-INSTUTNL WOOD/BARK WASTE WOOD BOILER
          8-DIGIT SCC-CODE MATCH
       Benzo(a)pyrene                                     1 EM. FACT(S). IN XATEF
       Benzo(ghi)perylene                                 1 EM. FACT(S). IN XATEF
       Chrysene                                           1 EM. FACT(S). IN XATEF
       Dibenz(a,h)anthracene                              1 EM. FACT(S). IN XATEF
       Fluoranthene                                       1 EM. FACT(S). IN XATEF
       Fluorene                                           1 EM. FACT(S). IN XATEF
       Phenanthrene                                       1 EM. FACT(S). IN XATEF
       Pyrene                                             1 EM. FACT(S). IN XATEF
       Methylphenanthrenes                                1 EM. FACT(S). IN XATEF

10500102  EXTCOMB BOILER SPACE HEATER INDUSTRIAL COAL          **
          NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

10500105  EXTCOMB BOILER SPACE HEATER INDUSTRIAL DISTILLATE OIL
          8-DIGIT SCC-CODE MATCH
       Benz(a)anthracene                                  1 EM. FACT(S). IN XATEF
       Primary sulfate                                    1 EM. FACT(S). IN XATEF

20100101  INTERNLCOMBUSTION ELECTRIC GENERATN DIST.OIL/DIESEL TURBINE
          NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

20100102  INTERNLCOMBUSTION ELECTRIC GENERATN DIST.OIL/DIESEL RECIPROCATING
          NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

20100291  SCC DESCRIPTION NOT FOUND IN XATEF
          NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

20100292  SCC DESCRIPTION NOT FOUND IN XATEF
          NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

20200102  INTERNLCOMBUSTION INDUSTRIAL DIST.OIL/DIESEL RECIPROCATING
          8-DIGIT SCC-CODE MATCH
       Mercury                                            1 EM. FACT(S). IN XATEF
       Dibenzothiophene                                   1 EM. FACT(S). IN XATEF
       Methylphenanthrenes                                1 EM. FACT(S). IN XATEF
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20200192 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

20200292 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

20300101 INTERNLCOMBUSTION COMMERCL-INSTUTNL DIST.OIL/DIESEL RECIPROCATING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

20300201 INTERNLCOMBUSTION COMMERCL-INSTUTNL NATURAL GAS RECIPROCATING
8-DIGIT SCC-CODE MATCH

Acetone	1 EM. FACT(S). IN XATEF
Ammonia	3 EM. FACT(S). IN XATEF
Barium	2 EM. FACT(S). IN XATEF
Benzene	1 EM. FACT(S). IN XATEF
Butylbenzyl phthalate	2 EM. FACT(S). IN XATEF
Chlorobenzene	1 EM. FACT(S). IN XATEF
Chromium	2 EM. FACT(S). IN XATEF
Copper	2 EM. FACT(S). IN XATEF
Cyanide	4 EM. FACT(S). IN XATEF
Dibutyl phthalate	2 EM. FACT(S). IN XATEF
1,1-Dichloroethane	1 EM. FACT(S). IN XATEF
Chloroethane	1 EM. FACT(S). IN XATEF
Ethylbenzene	1 EM. FACT(S). IN XATEF
Dioctyl phthalate	4 EM. FACT(S). IN XATEF
Manganese	2 EM. FACT(S). IN XATEF
Naphthalene	4 EM. FACT(S). IN XATEF
2-Nitrophenol	2 EM. FACT(S). IN XATEF
Phosphorus (yellow or white)	2 EM. FACT(S). IN XATEF
Silver	2 EM. FACT(S). IN XATEF
1,1,2,2-Tetrachloroethane	1 EM. FACT(S). IN XATEF
Toluene	1 EM. FACT(S). IN XATEF
Zinc	2 EM. FACT(S). IN XATEF
Phenol	2 EM. FACT(S). IN XATEF
Acenaphthene	2 EM. FACT(S). IN XATEF
Acenaphthylene	2 EM. FACT(S). IN XATEF
Benz(a)anthracene	2 EM. FACT(S). IN XATEF
Chrysene	2 EM. FACT(S). IN XATEF
Fluoranthene	2 EM. FACT(S). IN XATEF
Fluorene	2 EM. FACT(S). IN XATEF
Phenanthrene	4 EM. FACT(S). IN XATEF
Pyrene	2 EM. FACT(S). IN XATEF
Xylenes (mixed isomers)	1 EM. FACT(S). IN XATEF
Nickel	2 EM. FACT(S). IN XATEF
Silicon	2 EM. FACT(S). IN XATEF
Iron	2 EM. FACT(S). IN XATEF
Tungsten	2 EM. FACT(S). IN XATEF
Calcium	2 EM. FACT(S). IN XATEF
Potassium	2 EM. FACT(S). IN XATEF
Magnesium	2 EM. FACT(S). IN XATEF
Sulfur	2 EM. FACT(S). IN XATEF
Sodium	2 EM. FACT(S). IN XATEF
Benzofluoranthenes	2 EM. FACT(S). IN XATEF
Bis (2-Chloroethyl) ether	2 EM. FACT(S). IN XATEF

30100801 CHEMICAL MFG INORGANIC CHEMCLS CHLORO-ALKALI LIQFN-DIAPHRM CEL
8-DIGIT SCC-CODE MATCH

Chlorine	1 EM. FACT(S). IN XATEF

30100802 CHEMICAL MFG INORGANIC CHEMCLS CHLORO-ALKALI LIQFN-MERCURY CEL

8-DIGIT SCC-CODE MATCH
Chlorine 1 EM. FACT(S). IN XATEF

30100899 CHEMICAL MFG INORGANIC CHEMCLS CHLORO-ALKALI OTHER/NOT CLASI**
6-DIGIT SCC-CODE MATCH 301008
Carbon tetrachloride 3 EM. FACT(S). IN XATEF
Chlorine 4 EM. FACT(S). IN XATEF
Mercury 7 EM. FACT(S). IN XATEF

30101011 CHEMICAL MFG EXPLOSIVES TRINITROTOLUENE BATCH-FUME RECVRY
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30101015 CHEMICAL MFG EXPLOSIVES TRINITROTOLUENE BATCH-RED WTR INR
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30101699 CHEMICAL MFG AGRICULTURAL CHEM PHOS ACD/WET PROC NOT CLASSIFIED **
6-DIGIT SCC-CODE MATCH 301016
Fluoride 3 EM. FACT(S). IN XATEF

30101838 CHEMICAL MFG PLASTICS PRODN POLYESTER/ALKYD REACTOR KETTLE
6-DIGIT SCC-CODE MATCH 301018
1,3-Butadiene 9 EM. FACT(S). IN XATEF
Formaldehyde 2 EM. FACT(S). IN XATEF
Methylene chloride 1 EM. FACT(S). IN XATEF
Phosgene 3 EM. FACT(S). IN XATEF
Styrene 6 EM. FACT(S). IN XATEF
Vinyl chloride 26 EM. FACT(S). IN XATEF
Phenol 1 EM. FACT(S). IN XATEF

30101839 CHEMICAL MFG PLASTICS PRODN POLYESTER/ALKYD RESIN THINNG TANK
6-DIGIT SCC-CODE MATCH 301018 SEE ABOVE

30101899 CHEMICAL MFG PLASTICS PRODN NOT CLASSIFIED SEE COMMENTS
6-DIGIT SCC-CODE MATCH 301018 SEE ABOVE

30102199 CHEMICAL MFG INORGANIC CHEMCLS SODIUM CARBONATE NOT CLASSIFIED
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30102301 CHEMICAL MFG INORGANIC CHEMCLS H2S04-CONTACT ABSRBR 99.9% CONV
6-DIGIT SCC-CODE MATCH 301023
Primary sulfate 1 EM. FACT(S). IN XATEF

30102306 CHEMICAL MFG INORGANIC CHEMCLS H2S04-CONTACT ABSRBR 99.0% CONV
6-DIGIT SCC-CODE MATCH 301023 SEE ABOVE

30102320 CHEMICAL MFG INORGANIC CHEMCLS H2S04-CONTACT TNK CAR TRCK LDG
6-DIGIT SCC-CODE MATCH 301023 SEE ABOVE

30102399 CHEMICAL MFG INORGANIC CHEMCLS H2S04-CONTACT NOT CLASSIFIED **
6-DIGIT SCC-CODE MATCH 301023 SEE ABOVE

30103001 CHEMICAL MFG AGRICULTURAL CHEM AMMONM PHOSPHATES DRYER/COOLER
8-DIGIT SCC-CODE MATCH
Fluoride 1 EM. FACT(S). IN XATEF
Hydrogen fluoride 1 EM. FACT(S). IN XATEF

30103002 CHEMICAL MFG AGRICULTURAL CHEM AMMONM PHOSPHATES AMMONIAT-GRANULTR
8-DIGIT SCC-CODE MATCH
Fluoride 1 EM. FACT(S). IN XATEF
Hydrogen fluoride 1 EM. FACT(S). IN XATEF

30103003 CHEMICAL MFG AGRICULTURAL CHEM AMMONM PHOSPHATES SCREENING/TRANSFR
8-DIGIT SCC-CODE MATCH
Fluoride 1 EM. FACT(S). IN XATEF

30103099 CHEMICAL MFG AGRICULTURAL CHEM AMMONM PHOSPHATES NOT CLASSIFIED **
6-DIGIT SCC-CODE MATCH 301030
Ammonia 7 EM. FACT(S). IN XATEF
Fluoride 1 EM. FACT(S). IN XATEF
Hydrogen fluoride 1 EM. FACT(S). IN XATEF
Radionuclides 4 EM. FACT(S). IN XATEF

30103103 CHEMICAL MFG ORGANIC CHEMICALS TEREPHTHALIC ACID CRYSTL/DRYNG VENT
8-DIGIT SCC-CODE MATCH
Terephthalic acid 2 EM. FACT(S). IN XATEF

30107001 CHEMICAL MFG INORGANIC CHEMCLS GENERAL PROCESSES FUGITIVE LEAKS
6-DIGIT SCC-CODE MATCH 301070
Manganese 10 EM. FACT(S). IN XATEF

30107002 CHEMICAL MFG INORGANIC CHEMCLS GENERAL PROCESSES STORAGE/TRANSFER
6-DIGIT SCC-CODE MATCH 301070 SEE ABOVE

30113004 CHEMICAL MFG AGRICULTURAL CHEM AMMONIUM SULFATE ROTARY DRYER
8-DIGIT SCC-CODE MATCH
Ammonia 1 EM. FACT(S). IN XATEF
Ammonium sulfate (2:1) 1 EM. FACT(S). IN XATEF

30113099 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30114005 CHEMICAL MFG ORGANIC CHEMICALS ACETYLENE PRODN GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30125001 CHEMICAL MFG ORGANIC CHEMICALS METHANOL PRODCTN GENERAL
6-DIGIT SCC-CODE MATCH 301250
Formaldehyde 5 EM. FACT(S). IN XATEF
Propylene oxide 4 EM. FACT(S). IN XATEF
Propylene 1 EM. FACT(S). IN XATEF

30187007 INORGNC CHEM STRG FIXED ROOF TANKS PHOSPHORIC ACID BREATHING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30187009 INORGNC CHEM STRG FIXED ROOF TANKS SULFURIC ACID BREATHING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30187097 INORGNC CHEM STRG FIXED ROOF TANKS SPECIFY LIQUID BREATHING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30188599 INORGNC CHEM STRG PRESSURE TANKS SPECIFY GAS WITHDRAWAL LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30190099 CHEMICAL MFG MISCELLANEOUS WASTE GAS FLARES SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30199999 CHEMICAL MFG MISCELLANEOUS NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200102 FOOD/AGRICULTURE ALFALFA DEHYDRATI CYCLONE AND DRYER PRIMARY
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200103 FOOD/AGRICULTURE ALFALFA DEHYDRATI MEAL COLLECTOR CYCLONE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200104 FOOD/AGRICULTURE ALFALFA DEHYDRATI PELLET COOLER CYCLONE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200199 FOOD/AGRICULTURE ALFALFA DEHYDRATI NOT CLASSIFIED SEE COMMENT **
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200732 FOOD/AGRICULTURE GRAIN MILLING WHEAT MILLING PRECLEAN/HANDLING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200733 FOOD/AGRICULTURE GRAIN MILLING WHEAT MILLING CLEANING HOUSE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200734 FOOD/AGRICULTURE GRAIN MILLING WHEAT MILLING MILLHOUSE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200802 FOOD/AGRICULTURE FEED MANUFACTURE OTHER GRAIN FEED GRAIN RECEIVING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200804 FOOD/AGRICULTURE FEED MANUFACTURE OTHER GRAIN FEED HANDLING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200805 FOOD/AGRICULTURE FEED MANUFACTURE OTHER GRAIN FEED GRINDING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200806 FOOD/AGRICULTURE FEED MANUFACTURE OTHER GRAIN FEED PELLET COOLERS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200899 FOOD/AGRICULTURE FEED MANUFACTURE OTHER GRAIN FEED NOT CLASSIFIED **
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30200901 FOOD/AGRICULTURE FERMENTATION BEER PRODUCTION GRAIN HANDLING
6-DIGIT SCC-CODE MATCH 302009
Sodium hydroxide 1 EM. FACT(S). IN XATEF

30200903 FOOD/AGRICULTURE FERMENTATION BEER PRODUCTION BREWING
6-DIGIT SCC-CODE MATCH 302009 SEE ABOVE

30200999 FOOD/AGRICULTURE FERMENTATION BEER PRODUCTION OTHER/NOT CLASI**
6-DIGIT SCC-CODE MATCH 302009 SEE ABOVE

30201001 FOOD/AGRICULTURE FERMENTATION WHISKEY PRODUCTN GRAIN HANDLING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30201002 FOOD/AGRICULTURE FERMENTATION WHISKEY PRODUCTN DRYING SPNT GRAIN
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30201099 FOOD/AGRICULTURE FERMENTATION WHISKEY PRODUCTN OTHER/NOT CLASI**
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30201201 FOOD/AGRICULTURE FISH PROCESSING FISH MEAL COOKERS-FRESHFISH
8-DIGIT SCC-CODE MATCH
Hydrogen sulfide 1 EM. FACT(S). IN XATEF
Dimethylmethanamine, N,N- 1 EM. FACT(S). IN XATEF

30201205 FOOD/AGRICULTURE FISH PROCESSING FISH MEAL STEAM TUBE DRYER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30201299 FOOD/AGRICULTURE FISH PROCESSING FISH MEAL OTHER/NOT CLASI**
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30202601 FOOD/AGRICULTURE AGRIC.PRODUCTION SEED PROCESSING GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30203103 FOOD/AGRICULTURE GRAIN ELEVATORS EXPORT GRAIN ELEV CLEANING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30203105 FOOD/AGRICULTURE GRAIN ELEVATORS EXPORT GRAIN ELEV UNLOADING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30203106 FOOD/AGRICULTURE GRAIN ELEVATORS EXPORT GRAIN ELEV LOADING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30203107 FOOD/AGRICULTURE GRAIN ELEVATORS EXPORT GRAIN ELEV REMV BINS TUNL BT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30203109 FOOD/AGRICULTURE GRAIN ELEVATORS EXPORT GRAIN ELEV TRIPPER GALLRY BT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30203199 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30290001 FOOD/AGRICULTURE FUEL-FIRED EQPMNT PROCESS HEATERS DIST OIL(NO.2)
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30299999 FOOD/AGRICULTURE MISCELLANEOUS NOT CLASSIFIED SEE COMMENT
6-DIGIT SCC-CODE MATCH 302999

Ammonia	1 EM. FACT(S). IN XATEF
Formaldehyde	1 EM. FACT(S). IN XATEF

30300103 PRIMARY METALS ALUMINUM ELECTRO-REDUCTION VERTSTD SODERBERG
8-DIGIT SCC-CODE MATCH

Fluoride	14 EM. FACT(S). IN XATEF
Hydrogen fluoride	1 EM. FACT(S). IN XATEF
Polycyclic organic matter	2 EM. FACT(S). IN XATEF

30300104 PRIMARY METALS ALUMINUM ELECTRO-REDUCTION MATERIALS HANDLNG
6-DIGIT SCC-CODE MATCH 303001

Naphthalene	2 EM. FACT(S). IN XATEF
Radionuclides	14 EM. FACT(S). IN XATEF
Phenol	2 EM. FACT(S). IN XATEF
Polycyclic organic matter	3 EM. FACT(S). IN XATEF

30300110 PRIMARY METALS ALUMINUM ELECTRO-REDUCTION VERTL.SS-FUGITIVE
8-DIGIT SCC-CODE MATCH

Fluoride	2 EM. FACT(S). IN XATEF
Hydrogen fluoride	1 EM. FACT(S). IN XATEF

30300191 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 303001 SEE ABOVE

30300192 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 303001 SEE ABOVE

30300193 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 303001 SEE ABOVE

30300199 PRIMARY METALS ALUMINUM ELECTRO-REDUCTION NOT CLASSIFIED **
6-DIGIT SCC-CODE MATCH 303001 SEE ABOVE

30301001 PRIMARY METALS LEAD SMELTING SINTERING SINGLE STREAM
8-DIGIT SCC-CODE MATCH
Copper 1 EM. FACT(S). IN XATEF

30301002 PRIMARY METALS LEAD SMELTING BLAST FURNACE OPERATION
8-DIGIT SCC-CODE MATCH
Cadmium 1 EM. FACT(S). IN XATEF
Copper 1 EM. FACT(S). IN XATEF
Lead 2 EM. FACT(S). IN XATEF

30301008 PRIMARY METALS LEAD SMELTING SLAG FUME FURNACE
6-DIGIT SCC-CODE MATCH 303010
Arsenic 1 EM. FACT(S). IN XATEF
Cadmium 6 EM. FACT(S). IN XATEF
Copper 1 EM. FACT(S). IN XATEF
Radionuclides 8 EM. FACT(S). IN XATEF

30301010 PRIMARY METALS LEAD SMELTING MATERIALS HANDLNG CRUSHNG/GRINDING
6-DIGIT SCC-CODE MATCH 303010 SEE ABOVE

30301016 PRIMARY METALS LEAD SMELTING SINTERING TRANSFER
6-DIGIT SCC-CODE MATCH 303010 SEE ABOVE

30301019 PRIMARY METALS LEAD SMELTING BLAST FURNACE TAPPING METAL/SLG
6-DIGIT SCC-CODE MATCH 303010 SEE ABOVE

30301022 PRIMARY METALS LEAD SMELTING LEAD REFINING AG RETORT BLDG
6-DIGIT SCC-CODE MATCH 303010 SEE ABOVE

30301023 PRIMARY METALS LEAD SMELTING LEAD CASTING
6-DIGIT SCC-CODE MATCH 303010 SEE ABOVE

30301026 PRIMARY METALS LEAD SMELTING SINTERING PRODUCT DUMP AREA
6-DIGIT SCC-CODE MATCH 303010 SEE ABOVE

30301099 PRIMARY METALS LEAD SMELTING NOT CLASSIFIED SEE COMMENT **
6-DIGIT SCC-CODE MATCH 303010 SEE ABOVE

30301102 MINING OPERATIONS METAL ORE MINING MOLYBEDENUM MILLING-GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30301199 MINING OPERATIONS METAL ORE MINING MOLYBEDENUM PROCESSING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30301301 MINING OPERATIONS METAL ORE MINING GOLD MINING GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30302401 MINING OPERATIONS METAL ORE MINING LOW MOISTURE ORE PRIMARY CRUSHING
6-DIGIT SCC-CODE MATCH 303024
Mercury 1 EM. FACT(S). IN XATEF
Vanadium 1 EM. FACT(S). IN XATEF

30302402 MINING OPERATIONS METAL ORE MINING LOW MOISTURE ORE SECONDRY CRUSHING
6-DIGIT SCC-CODE MATCH 303024 SEE ABOVE

30302404 MINING OPERATIONS METAL ORE MINING LOW MOISTURE ORE MATERIAL HANDLING
6-DIGIT SCC-CODE MATCH 303024 SEE ABOVE

30302408 MINING OPERATIONS METAL ORE MINING HIGH MOISTURE ORE MATERIAL HANDLING
6-DIGIT SCC-CODE MATCH 303024 SEE ABOVE

30302411 MINING OPERATIONS METAL ORE MINING DRYING-ALL MINERL BUT TI/ZR SANDS
6-DIGIT SCC-CODE MATCH 303024 SEE ABOVE

30302499 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 303024 SEE ABOVE

30303006 PRIMARY METALS ZINC SMELTING PROCESSOR ELECTROLYTIC
6-DIGIT SCC-CODE MATCH 303030

Cadmium	33	EM. FACT(S). IN XATEF
Copper	3	EM. FACT(S). IN XATEF
Radionuclides	25	EM. FACT(S). IN XATEF
Zinc	1	EM. FACT(S). IN XATEF
Primary sulfate	1	EM. FACT(S). IN XATEF

30303008 PRIMARY METALS ZINC SMELTING ROASTING FLUID BED
6-DIGIT SCC-CODE MATCH 303030 SEE ABOVE

30303009 PRIMARY METALS ZINC SMELTING RAW MATERIAL HANDLING/TRANSFER
6-DIGIT SCC-CODE MATCH 303030 SEE ABOVE

30303012 PRIMARY METALS ZINC SMELTING RAW MATERIAL UNLOADING
6-DIGIT SCC-CODE MATCH 303030 SEE ABOVE

30303015 PRIMARY METALS ZINC SMELTING ZINC MELTING
6-DIGIT SCC-CODE MATCH 303030 SEE ABOVE

30303099 PRIMARY METALS ZINC SMELTING NOT CLASSIFIED SEE COMMENT **
6-DIGIT SCC-CODE MATCH 303030 SEE ABOVE

30390003 PRIMARY METALS FUEL-FIRED EQPMNT PROCESS HEATERS NAT GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30399999 PRIMARY METALS MISCELLANEOUS NOT CLASSIFIED SEE COMMENT
8-DIGIT SCC-CODE MATCH

Formaldehyde	13	EM. FACT(S). IN XATEF

30400101 SECONDARY METALS SEC. ALUMINUM SWEATING FURNACE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30400208 SECONDARY METALS SEC. COPPER WIRE BURNING INCINERATOR
6-DIGIT SCC-CODE MATCH 304002

Cadmium	3	EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1	EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	1	EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	1	EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	1	EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	1	EM. FACT(S). IN XATEF
Hexachlorodibenzofurans, total	1	EM. FACT(S). IN XATEF
Hexachlorodibenzo-p-dioxins, total	1	EM. FACT(S). IN XATEF
Heptachlorodibenzo-p-dioxins, total	1	EM. FACT(S). IN XATEF
Pentachlorodibenzo-p-dioxins, total	1	EM. FACT(S). IN XATEF
Octachlorodibenzo-p-dioxins, total	1	EM. FACT(S). IN XATEF
Pentachlorodibenzofurans, total	1	EM. FACT(S). IN XATEF
Octachlorodibenzofurans, total	1	EM. FACT(S). IN XATEF

30400301 PRIMARY METALS IRON/STEEL FOUNDY GRAY IRON FOUNDRY CUPOLA

8-DIGIT SCC-CODE MATCH

Anthracene	1 EM. FACT(S). IN XATEF
Arsenic	1 EM. FACT(S). IN XATEF
Benzo(a)pyrene	1 EM. FACT(S). IN XATEF
Copper	1 EM. FACT(S). IN XATEF
Lead	3 EM. FACT(S). IN XATEF
Manganese	6 EM. FACT(S). IN XATEF
Phenols	1 EM. FACT(S). IN XATEF
Aldehydes	1 EM. FACT(S). IN XATEF
Benz(a)anthracene	1 EM. FACT(S). IN XATEF
Benzo(k)fluoranthene	1 EM. FACT(S). IN XATEF
Benzo(ghi)perylene	1 EM. FACT(S). IN XATEF
Chrysene	1 EM. FACT(S). IN XATEF
Fluoranthene	1 EM. FACT(S). IN XATEF
Indeno(1,2,3-cd)pyrene	1 EM. FACT(S). IN XATEF
Pyrene	1 EM. FACT(S). IN XATEF
Benzo(b)fluoranthene	1 EM. FACT(S). IN XATEF
Coronene	1 EM. FACT(S). IN XATEF

30400331 PRIMARY METALS IRON/STEEL FOUNDY GRAY IRON FOUNDRY CASTING SHAKEOUT
6-DIGIT SCC-CODE MATCH 304003

Manganese	1 EM. FACT(S). IN XATEF

30400391 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 304003 SEE ABOVE

30400399 PRIMARY METALS IRON/STEEL FOUNDY GRAY IRON FOUNDRY NOT CLASSIFIED
6-DIGIT SCC-CODE MATCH 304003 SEE ABOVE

30500201 PETROLEUM INDRY ASPHALT CONCRETE ROTARY DRYER CONVENTIONAL PLNT
8-DIGIT SCC-CODE MATCH

Aluminum	1 EM. FACT(S). IN XATEF
Beryllium	1 EM. FACT(S). IN XATEF
Cadmium	1 EM. FACT(S). IN XATEF
Chromium	1 EM. FACT(S). IN XATEF
Lead	1 EM. FACT(S). IN XATEF
Manganese	1 EM. FACT(S). IN XATEF
Mercury	1 EM. FACT(S). IN XATEF
Vanadium	1 EM. FACT(S). IN XATEF
Zinc	1 EM. FACT(S). IN XATEF
Nickel	1 EM. FACT(S). IN XATEF
Iron	1 EM. FACT(S). IN XATEF
Calcium	1 EM. FACT(S). IN XATEF
Magnesium	1 EM. FACT(S). IN XATEF
Polycyclic organic matter	1 EM. FACT(S). IN XATEF

30500205 PETROLEUM INDRY ASPHALT CONCRETE DRUM DRYER HOT ASPHALT PLANT
8-DIGIT SCC-CODE MATCH

Polycyclic organic matter	4 EM. FACT(S). IN XATEF

30500206 PETROLEUM INDRY ASPHALT CONCRETE ASPHALT HEATER NATURAL GAS
6-DIGIT SCC-CODE MATCH 305002

Aluminum	2 EM. FACT(S). IN XATEF
Anthracene	1 EM. FACT(S). IN XATEF
Benzo(a)pyrene	1 EM. FACT(S). IN XATEF
Beryllium	2 EM. FACT(S). IN XATEF
Butyraldehyde	1 EM. FACT(S). IN XATEF
Cadmium	2 EM. FACT(S). IN XATEF
Chromium	2 EM. FACT(S). IN XATEF
Formaldehyde	1 EM. FACT(S). IN XATEF

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        Lead                                                2 EM. FACT(S). IN XATEF
        Manganese                                           2 EM. FACT(S). IN XATEF
        Mercury                                             2 EM. FACT(S). IN XATEF
        Vanadium                                            3 EM. FACT(S). IN XATEF
        Zinc                                                2 EM. FACT(S). IN XATEF
        Benz(a)anthracene                                   1 EM. FACT(S). IN XATEF
        Benzo(k)fluoranthene                                1 EM. FACT(S). IN XATEF
        Chrysene                                            1 EM. FACT(S). IN XATEF
        Dibenz(a,h)anthracene                               1 EM. FACT(S). IN XATEF
        Fluoranthene                                        1 EM. FACT(S). IN XATEF
        Indeno(1,2,3-cd)pyrene                              1 EM. FACT(S). IN XATEF
        Phenanthrene                                        1 EM. FACT(S). IN XATEF
        Pyrene                                              1 EM. FACT(S). IN XATEF
        Nickel                                              2 EM. FACT(S). IN XATEF
        Iron                                                2 EM. FACT(S). IN XATEF
        Calcium                                             3 EM. FACT(S). IN XATEF
        Magnesium                                           2 EM. FACT(S). IN XATEF
        Benzo(b)fluoranthene                                1 EM. FACT(S). IN XATEF
        7H-Dibenzo(cg)carbazole                             1 EM. FACT(S). IN XATEF
        Benzo(e)pyrene                                      1 EM. FACT(S). IN XATEF
        Methylanthracenes                                   1 EM. FACT(S). IN XATEF
        Perylene                                            1 EM. FACT(S). IN XATEF

30500208   PETROLEUM INDRY ASPHALT CONCRETE ASPHALT HEATER DISTILLATE OIL
           6-DIGIT SCC-CODE MATCH   305002    SEE ABOVE

30500211   SCC DESCRIPTION NOT FOUND IN XATEF
           6-DIGIT SCC-CODE MATCH   305002    SEE ABOVE

30500298   SCC DESCRIPTION NOT FOUND IN XATEF
           6-DIGIT SCC-CODE MATCH   305002    SEE ABOVE

30500299   PETROLEUM INDRY ASPHALT CONCRETE NOT CLASSIFIED SEE COMMENT    **
           6-DIGIT SCC-CODE MATCH   305002    SEE ABOVE

30500301   MINERAL PRODUCTS BRICK MFG RAW MATERIAL DRYING
           6-DIGIT SCC-CODE MATCH   305003
        Fluoride                                            1 EM. FACT(S). IN XATEF
        Hydrogen fluoride                                   1 EM. FACT(S). IN XATEF

30500307   MINERAL PRODUCTS BRICK MFG CALCINING
           6-DIGIT SCC-CODE MATCH   305003    SEE ABOVE

30500311   MINERAL PRODUCTS BRICK MFG TUNNEL KILNS GAS-FIRED
           6-DIGIT SCC-CODE MATCH   305003    SEE ABOVE

30500394   SCC DESCRIPTION NOT FOUND IN XATEF
           6-DIGIT SCC-CODE MATCH   305003    SEE ABOVE

30500398   MINERAL PRODUCTS BRICK MFG NOT CLASSIFIED SEE COMMENT
           6-DIGIT SCC-CODE MATCH   305003    SEE ABOVE

30500606   MINERAL PRODUCTS CEMENT MFG DRY PROCESS KILNS
           8-DIGIT SCC-CODE MATCH
        Cadmium                                             1 EM. FACT(S). IN XATEF
        Chromium                                            3 EM. FACT(S). IN XATEF
        Manganese                                           3 EM. FACT(S). IN XATEF
        Nickel                                              1 EM. FACT(S). IN XATEF

30500612   MINERAL PRODUCTS CEMENT MFG DRY PROCESS RAW MAT TRANSFER
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6-DIGIT SCC-CODE MATCH 305006

Beryllium	1 EM. FACT(S). IN XATEF
Cadmium	9 EM. FACT(S). IN XATEF
Polychlorinated dibenzofurans, total	1 EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Nickel	4 EM. FACT(S). IN XATEF

30500614 MINERAL PRODUCTS CEMENT MFG DRY PROCESS CLINKER COOLER
6-DIGIT SCC-CODE MATCH 305006 SEE ABOVE

30500618 MINERAL PRODUCTS CEMENT MFG DRY PROCESS CEMENT SILOS
6-DIGIT SCC-CODE MATCH 305006 SEE ABOVE

30500619 MINERAL PRODUCTS CEMENT MFG DRY PROCESS CEMENT LOAD OUT
6-DIGIT SCC-CODE MATCH 305006 SEE ABOVE

30500718 MINERAL PRODUCTS CEMENT MFG WET PROCESS CEMENT SILO
6-DIGIT SCC-CODE MATCH 305007

Manganese	1 EM. FACT(S). IN XATEF

30500799 MINERAL PRODUCTS CEMENT MFG WET PROCESS NOT CLASSIFIED **
6-DIGIT SCC-CODE MATCH 305007 SEE ABOVE

30500802 MINERAL PRODUCTS CERAMIC CLAY MFG GRINDING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501001 MINING OPERATIONS COAL CLEANING THERMAL DRYER FLUIDIZED BED
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501008 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING UNLOADING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501009 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING RAW COAL STORAGE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501010 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING CRUSHING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501011 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING COAL TRANSFER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501012 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING SCREENING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501014 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING CLEAN COAL STORGE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501015 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING LOADING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501016 MINING OPERATIONS COAL CLEANING MATERIAL HANDLING LOADING CLEANCOAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501038 MINING OPERATIONS SURFACE COAL MINE TRUCK LOADING COAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501040 MINING OPERATIONS SURFACE COAL MINE DUMP TRUCK UNLOAD END DUMP-COAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501099 MINING OPERATIONS COAL CLEANING NOT CLASSIFIED SEE COMMENT

NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501101 MINERAL PRODUCTS CONCRETE BATCHING GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501107 MINERAL PRODUCTS CONCRETE BATCHING CEMENT UNLOADING ELEVATED SILOS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501109 MINERAL PRODUCTS CONCRETE BATCHING MIXER LOADING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501115 MINERAL PRODUCTS CONCRETE BATCHING STORAGE BINS/HOPPERS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501199 MINERAL PRODUCTS CONCRETE BATCHING NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501402 MINERAL PRODUCTS GLASS MFG CONTAINER GLASS MELTING FURNACE
8-DIGIT SCC-CODE MATCH
Selenium 1 EM. FACT(S). IN XATEF

30501513 MINERAL PRODUCTS GYPSUM MFG IMPACT MILL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501602 MINERAL PRODUCTS LIME MFG SECOND CRUSH/SCRN
6-DIGIT SCC-CODE MATCH 305016
Polychlorinated dibenzofurans, total 2 EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total 2 EM. FACT(S). IN XATEF

30501604 MINERAL PRODUCTS LIME MFG CALCINING ROTARY KILN
6-DIGIT SCC-CODE MATCH 305016 SEE ABOVE

30501609 MINERAL PRODUCTS LIME MFG HYDRATOR ATMOSPHERIC
6-DIGIT SCC-CODE MATCH 305016 SEE ABOVE

30501611 MINERAL PRODUCTS LIME MFG PRODUCT COOLER
6-DIGIT SCC-CODE MATCH 305016 SEE ABOVE

30501613 MINERAL PRODUCTS LIME MFG LIME SILOS
6-DIGIT SCC-CODE MATCH 305016 SEE ABOVE

30501615 MINERAL PRODUCTS LIME MFG PRODUCT TRAN/CONV
6-DIGIT SCC-CODE MATCH 305016 SEE ABOVE

30501699 MINERAL PRODUCTS LIME MFG NOT CLASSIFIED SEE COMMENT **
6-DIGIT SCC-CODE MATCH 305016 SEE ABOVE

30501702 MINERAL PRODUCTS MINERAL WOOL REVERB FURNACE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501703 MINERAL PRODUCTS MINERAL WOOL BLOW CHAMBER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501705 MINERAL PRODUCTS MINERAL WOOL COOLER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30501901 MINING OPERATIONS NONMETALLIC MINRL PHOSPHATE ROCK DRYING
8-DIGIT SCC-CODE MATCH
Radionuclides 1 EM. FACT(S). IN XATEF

30501902 MINING OPERATIONS NONMETALLIC MINRL PHOSPHATE ROCK GRINDING
8-DIGIT SCC-CODE MATCH
Radionuclides 1 EM. FACT(S). IN XATEF

30501903 MINING OPERATIONS NONMETALLIC MINRL PHOSPHATE ROCK TRANSFER/STORAGE
6-DIGIT SCC-CODE MATCH 305019
Radionuclides 1 EM. FACT(S). IN XATEF

30501991 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 305019 SEE ABOVE

30502001 MINING OPERATIONS NONMETALLIC MINRL STONE QUARRYING PRIMARY CRUSHING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502002 MINING OPERATIONS NONMETALLIC MINRL STONE QUARRYING SECONDRY CRUSHING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502006 MINING OPERATIONS NONMETALLIC MINRL STONE QUARRYING SCREEN/CONVEY
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502012 MINING OPERATIONS NONMETALLIC MINRL STONE QUARRYING DRYING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502099 MINING OPERATIONS NONMETALLIC MINRL STONE QUARRYING NOT CLASSIFIED **
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502192 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502501 MINING OPERATIONS NONMETALLIC MINRL SAND/GRAVEL TOTAL PLNT-GENL**
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502503 MINING OPERATIONS NONMETALLIC MINRL SAND/GRAVEL TRANSFER STATION
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502508 MINING OPERATIONS NONMETALLIC MINRL SAND/GRAVEL DRYER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30502510 MINING OPERATIONS NONMETALLIC MINRL SAND/GRAVEL CRUSHING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30503110 MINING OPERATIONS NONMETALLIC MINRL ASBESTOS MINING STOCKPILING
6-DIGIT SCC-CODE MATCH 305031
Asbestos 3 EM. FACT(S). IN XATEF

30503202 MINING OPERATIONS NONMETALLIC MINRL ASBESTOS MILLING DRYING
6-DIGIT SCC-CODE MATCH 305032
Asbestos 5 EM. FACT(S). IN XATEF
Nickel 1 EM. FACT(S). IN XATEF

30503299 MINING OPERATIONS NONMETALLIC MINRL ASBESTOS MILLING NOT CLASSIFIED
6-DIGIT SCC-CODE MATCH 305032 SEE ABOVE

30504030 MINING OPERATIONS UNSPECIFIED ORE SEE COMMENT PRIMARY CRUSHER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30510101 MINERAL PRODUCTS BULK MATERIALS CONVEYORS AMMONIUM SULFATE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30510296 MINERAL PRODUCTS BULK MATERIALS STOAGE BINS CHEMICAL,OTHER

NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30510403 MINERAL PRODUCTS BULK MATERIALS UNLOADING OPERATN COAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30590003 MINERAL PRODUCTS FUEL-FIRED EQPMNT PROCESS HEATERS NAT GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30599999 MINERAL PRODUCTS MISCELLANEOUS NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30600106 PETROLEUM INDRY PETROLEUM REFNG PROCESS HEATERS PROCESS GAS-FIRED
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30600195 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30600201 PETROLEUM INDRY PETROLEUM REFNG CATALYTIC CRACKNG FLUID CAT.CRACKER
8-DIGIT SCC-CODE MATCH

Ammonia	3 EM. FACT(S). IN XATEF
Benzo(a)pyrene	3 EM. FACT(S). IN XATEF
Formaldehyde	1 EM. FACT(S). IN XATEF
Aldehydes	1 EM. FACT(S). IN XATEF
Benzo(ghi)perylene	1 EM. FACT(S). IN XATEF
Fluoranthene	1 EM. FACT(S). IN XATEF
Phenanthrene	1 EM. FACT(S). IN XATEF
Carbon monoxide	1 EM. FACT(S). IN XATEF
Benzo(e)pyrene	1 EM. FACT(S). IN XATEF
Primary sulfate	1 EM. FACT(S). IN XATEF

30600603 PETROLEUM INDRY PETROLEUM REFNG VACUUM DISTILATN COLUMN CONDENSER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30600702 PETROLEUM INDRY PETROLEUM REFNG COOLING TOWERS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30600903 PETROLEUM INDRY PETROLEUM REFNG FLARES NAT GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30600904 PETROLEUM INDRY PETROLEUM REFNG FLARES PROCESS GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30609904 PETROLEUM INDRY PETROLEUM REFNG INCINERATORS PROCESS GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700105 PULP & PAPER KRAFT PULPING SMELT DISSOLV TNK GENERAL
8-DIGIT SCC-CODE MATCH

Hydrogen sulfide	2 EM. FACT(S). IN XATEF
Sodium hydroxide	5 EM. FACT(S). IN XATEF

30700194 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 307001

Chloroform	2 EM. FACT(S). IN XATEF
Hydrogen sulfide	3 EM. FACT(S). IN XATEF
Methanol	4 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF

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        Hexachlorodibenzofurans, total                          1 EM. FACT(S). IN XATEF
        Hexachlorodibenzo-p-dioxins, total                      1 EM. FACT(S). IN XATEF
        Heptachlorodibenzo-p-dioxins, total                     1 EM. FACT(S). IN XATEF
        Pentachlorodibenzo-p-dioxins, total                     1 EM. FACT(S). IN XATEF
        Octachlorodibenzo-p-dioxins, total                      1 EM. FACT(S). IN XATEF
        Pentachlorodibenzofurans, total                         1 EM. FACT(S). IN XATEF
        Octachlorodibenzofurans, total                          1 EM. FACT(S). IN XATEF

30700196   SCC DESCRIPTION NOT FOUND IN XATEF
           6-DIGIT SCC-CODE MATCH   307001    SEE ABOVE

30700199   PULP & PAPER KRAFT PULPING NOT CLASSIFIED SEE COMMENT
           6-DIGIT SCC-CODE MATCH   307001    SEE ABOVE

30700201   SCC DESCRIPTION NOT FOUND IN XATEF
           6-DIGIT SCC-CODE MATCH   307002
        Chloroform                                              2 EM. FACT(S). IN XATEF

30700231   PULP & PAPER SULFITE PULPING ACID PLANT NH3 BASE
           6-DIGIT SCC-CODE MATCH   307002    SEE ABOVE

30700232   PULP & PAPER SULFITE PULPING ACID PLANT NA BASE
           6-DIGIT SCC-CODE MATCH   307002    SEE ABOVE

30700234   PULP & PAPER SULFITE PULPING MISCELLANEOUS SRC KNOTTERS/WASH/SCN
           6-DIGIT SCC-CODE MATCH   307002    SEE ABOVE

30700299   PULP & PAPER SULFITE PULPING NOT CLASSIFIED SEE COMMENT    **
           6-DIGIT SCC-CODE MATCH   307002    SEE ABOVE

30700401   PULP & PAPER PULPBOARD PAPERBOARD GENERAL
           NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700499   PULP & PAPER PULPBOARD NOT CLASSIFIED SEE COMMENT    **
           NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700598   WOOD PRODUCTS WOOD PRESS TREAT NOT CLASSIFIED SEE COMMENT
           6-DIGIT SCC-CODE MATCH   307005
        Anthracene                                              1 EM. FACT(S). IN XATEF
        Benzene                                                 1 EM. FACT(S). IN XATEF
        Ethylbenzene                                            1 EM. FACT(S). IN XATEF
        Naphthalene                                             4 EM. FACT(S). IN XATEF
        Pentachlorophenol (PCP)                                 4 EM. FACT(S). IN XATEF
        Toluene                                                 1 EM. FACT(S). IN XATEF
        Phenol                                                  3 EM. FACT(S). IN XATEF

30700701   WOOD PRODUCTS PLYWOOD/PARTBOARD VENEER DRYERS GENERAL
           6-DIGIT SCC-CODE MATCH   307007
        1,3-Butadiene                                           1 EM. FACT(S). IN XATEF
        Formaldehyde                                            1 EM. FACT(S). IN XATEF

30700702   WOOD PRODUCTS PLYWOOD/PARTBOARD SAND OPERATIONS GENERAL
           6-DIGIT SCC-CODE MATCH   307007    SEE ABOVE

30700703   WOOD PRODUCTS PLYWOOD/PARTBOARD PRT BRD DRY OPER GENERAL
           8-DIGIT SCC-CODE MATCH
        Formaldehyde                                           38 EM. FACT(S). IN XATEF

30700704   WOOD PRODUCTS PLYWOOD/PARTBOARD WAFERBOARD DRYER
           8-DIGIT SCC-CODE MATCH
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Formaldehyde 3 EM. FACT(S). IN XATEF
Phenol 1 EM. FACT(S). IN XATEF

30700711 WOOD PRODUCTS PLYWOOD/PARTBOARD VENEER DRYERS FIR-SAPWOOD-STEAM
6-DIGIT SCC-CODE MATCH 307007 SEE ABOVE

30700712 WOOD PRODUCTS PLYWOOD/PARTBOARD VENEER DRYERS FIR-SAPWOOD-GAS
6-DIGIT SCC-CODE MATCH 307007 SEE ABOVE

30700799 WOOD PRODUCTS PLYWOOD/PARTBOARD NOT CLASSIFIED SEE COMMENT
6-DIGIT SCC-CODE MATCH 307007 SEE ABOVE

30700802 WOOD PRODUCTS SAWMILL OPERATION LOG SAWING GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700803 WOOD PRODUCTS SAWMILL OPERATION SAWDUST HANDLING GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700804 WOOD PRODUCTS SAWMILL OPERATION SAWING CYCLONE EXHAUST
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700805 WOOD PRODUCTS SAWMILL OPERATION PLANING & TRIMMNG CYCLONE EXHAUST
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700808 WOOD PRODUCTS SAWMILL OPERATION OTHER CYCLONES CYCLONE EXHAUST
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700881 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700886 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700891 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700896 WOOD PRODUCTS SAWMILL OPERATION NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700897 WOOD PRODUCTS SAWMILL OPERATION NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700898 WOOD PRODUCTS SAWMILL OPERATION NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30700899 WOOD PRODUCTS SAWMILL OPERATION NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30701399 PULP & PAPER MISC. PAPER PROD NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30702098 WOOD PRODUCTS FURNITURE MFG NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30702099 WOOD PRODUCTS FURNITURE MFG NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30703001 WOOD PRODUCTS MISCELLANEOUS WOODWASTE STORAGE BIN VENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30703096 WOOD PRODUCTS MISCELLANEOUS SANDING/PLANING SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30790003 WOOD PRODUCTS FUEL FIRED EQPMNT PROCESS HEATERS NAT GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30790004 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30799999 WOOD PRODUCTS MISCELLANEOUS NOT CLASSIFIED SEE COMMENT **
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30800701 RUBBER/PLASTICS FAB. PLASTIC PROD PLASTICS MACHINNG DRILNG,SANDNG,ETC
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30800702 RUBBER/PLASTICS FAB. PLASTIC PROD MOLD RELEASE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30800720 RUBBER/PLASTICS FAB. PLASTIC PROD FIBERGLASS RESIN PRODUCT-GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30800799 RUBBER/PLASTICS FAB.PLASTIC PROD NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30890003 RUBBER/PLASTICS FUEL FIRED EQPMNT PROCESS HEATERS NAT GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30899999 RUBBER/PLASTICS MISCELLANEOUS NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30900202 FABRICATED METALS ABRASIVE BLASTING OF METAL PARTS SAND ABRASIVE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30900205 FABRICATED METALS ABRASIVE BLASTING OF METAL PARTS STEEL GRIT ABRSVE
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30901601 FABRICATED METALS PIPE COATING ASPHALT DIPPING GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

30902501 FABRICATED METALS DRUMS/BARRELS DRUM CLEANING DRUM BURNING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31000199 OIL & GAS PRODN CRUDE OIL PRODN NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31000201 OIL & GAS PRODN NATURAL GAS PRODN GAS SWEETENING AMINE PROCESS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31000203 OIL & GAS PRODN NATURAL GAS PRODN COMPRESSORS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31000205 OIL & GAS PRODN NATURAL GAS PRODN FLARES
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31000299 OIL & GAS PRODN NATURAL GAS PRODN NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31000404 OIL & GAS PRODN FUEL-FIRED EQPMNT PROCESS HEATERS NATURAL GAS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31299999 MACHINERY MISCELLANEOUS NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31307001 ELECTRICAL EQPMNT WINDINGS RECLAMTN INCINERATOR OVEN SINGLE CHAMBER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31307002 ELECTRICAL EQPMNT WINDINGS RECLAMTN INCINERATOR OVEN MULTIPLE CHAMBER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

31499999 TRANSPORTN EQPMNT MISCELLANEOUS NOT CLASSIFIED SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40200101 ORGANIC SOLVENT SURFACE COATING PAINT-GENERAL SOLVENT-BASE CTNG
8-DIGIT SCC-CODE MATCH

Toluene	1 EM. FACT(S). IN XATEF
Xylenes (mixed isomers)	1 EM. FACT(S). IN XATEF

40200401 ORGANIC SOLVENT SURFACE COATING LACQUER GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40200501 ORGANIC SOLVENT SURFACE COATING ENAMEL GENERAL
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40201627 ORGANIC SOLVENT SURFACE COATING LIGHT DUTY TRUCK PRIMECOAT-SOLVENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40201699 ORGANIC SOLVENT SURFACE COATING AUTOS/LIGHT TRUCK SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40201901 ORGANIC SOLVENT SURFACE COATING WOOD FURNITURE COATING OPERATION
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40202132 ORGANIC SOLVENT SURFACE COATING FLATWOOD PRODUCTS SOLVNTBORNE COATG
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40202399 ORGANIC SOLVENT SURFACE COATING LARGE SHIPS SEE COMMENT
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40202501 ORGANIC SOLVENT SURFACE COATING MISC.METAL PARTS COATING OPERATION
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40202607 ORGANIC SOLVENT SURFACE COATING STEEL DRUMS EXTERIOR COATING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40301019 PETROLEUM STORAGE FIXED ROOF TANKS DIST FUEL NO.2 67K BBL-BREATHING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40301021 PETROLEUM STORAGE FIXED ROOF TANKS DIST FUEL NO.2 WORKING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40301097 PETROLEUM STORAGE FIXED ROOF TANKS SPECIFY LIQUID 67K BBL-BREATHING
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40301101 PETROLEUM STORAGE FLOAT ROOF TANKS GASOLINE-RVP 13 67K BBL-STAND LOS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40301109 PETROLEUM STORAGE FLOAT ROOF TANKS CRUDE OIL-RVP 5 67K BBL-STAND LOS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40301117 PETROLEUM STORAGE FLOAT ROOF TANKS CRUDE OIL WITHDRAWAL LOSS

NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40400291 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 404002

Benzene	6 EM. FACT(S). IN XATEF
1,2-Dichloroethane	7 EM. FACT(S). IN XATEF
Gasoline	7 EM. FACT(S). IN XATEF
1,2-Dibromoethane	7 EM. FACT(S). IN XATEF

40400294 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 404002 SEE ABOVE

40400297 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 404002 SEE ABOVE

40400298 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 404002 SEE ABOVE

40400301 OIL & GAS PRODN CRUDE OIL STORAGE FIXED ROOF TANK BREATHING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40600131 PETROLEUM MARKTNG TANK CARS/TRUCKS GASOLINE-SUBMERGE LOAD-NORMAL SVC
8-DIGIT SCC-CODE MATCH

Benzene	1 EM. FACT(S). IN XATEF

40600135 PETROLEUM MARKTNG TANK CARS/TRUCKS DIST OIL-SUBMERGE LOAD-NORMAL SVC
6-DIGIT SCC-CODE MATCH 406001

1,2-Dichloroethane	4 EM. FACT(S). IN XATEF
Gasoline	4 EM. FACT(S). IN XATEF
1,2-Dibromoethane	4 EM. FACT(S). IN XATEF

40700815 ORGANIC CHEM STRG FIXED ROOF TANKS METHYL ALCOHOL BREATHING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40701612 ORGANIC CHEM STRG FIXED ROOF TANKS NAPHTHA WORKING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40705698 ORGANIC CHEM STRG FIXED ROOF TANKS SPECIFY GLYCOL WORKING LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

40782099 ORGANIC CHEM STRG PRESSURE TANKS SPECIFY ALKENE WITHDRAWAL LOSS
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

50100191 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 501001

Aluminum	1 EM. FACT(S). IN XATEF
Arsenic	23 EM. FACT(S). IN XATEF
Barium	1 EM. FACT(S). IN XATEF
Benzo(a)pyrene	15 EM. FACT(S). IN XATEF
Beryllium	18 EM. FACT(S). IN XATEF
Cadmium	23 EM. FACT(S). IN XATEF
Chlorobenzene	7 EM. FACT(S). IN XATEF
Chromium	22 EM. FACT(S). IN XATEF
Cobalt	1 EM. FACT(S). IN XATEF
Copper	1 EM. FACT(S). IN XATEF
Formaldehyde	15 EM. FACT(S). IN XATEF
Hydrogen chloride	32 EM. FACT(S). IN XATEF
Hydrogen fluoride	19 EM. FACT(S). IN XATEF
Manganese	3 EM. FACT(S). IN XATEF
Mercury	31 EM. FACT(S). IN XATEF

Polychlorinated biphenyls (PCBs)	19	EM. FACT(S). IN XATEF
Selenium	3	EM. FACT(S). IN XATEF
Silver	1	EM. FACT(S). IN XATEF
Zinc	1	EM. FACT(S). IN XATEF
Chromium (VI)	4	EM. FACT(S). IN XATEF
Chlorobenzenes	10	EM. FACT(S). IN XATEF
Chlorophenols	10	EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzo-p-dioxin	16	EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	16	EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	16	EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	16	EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total	12	EM. FACT(S). IN XATEF
Dibenzofuran	12	EM. FACT(S). IN XATEF
Nickel	21	EM. FACT(S). IN XATEF
Sulfur trioxide	9	EM. FACT(S). IN XATEF
Chlorophenol	6	EM. FACT(S). IN XATEF

50100505 SOLID WASTE DISPL GOVERNMENT OTHER INCINERATOR PATHOLOGICAL
6-DIGIT SCC-CODE MATCH 501005

Acenaphthene	1	EM. FACT(S). IN XATEF

50100506 SOLID WASTE DISPL GOVERNMENT OTHER INCINERATOR SLUDGE
8-DIGIT SCC-CODE MATCH

Acetone	1	EM. FACT(S). IN XATEF
Acetonitrile	5	EM. FACT(S). IN XATEF
Acrylonitrile	5	EM. FACT(S). IN XATEF
Aldrin	2	EM. FACT(S). IN XATEF
Aluminum	6	EM. FACT(S). IN XATEF
Antimony	6	EM. FACT(S). IN XATEF
Arsenic	10	EM. FACT(S). IN XATEF
Barium	6	EM. FACT(S). IN XATEF
Benzene	5	EM. FACT(S). IN XATEF
Beryllium	4	EM. FACT(S). IN XATEF
Bromodichloromethane	3	EM. FACT(S). IN XATEF
Cadmium	11	EM. FACT(S). IN XATEF
Carbon tetrachloride	5	EM. FACT(S). IN XATEF
Chlordane	2	EM. FACT(S). IN XATEF
Chlorobenzene	5	EM. FACT(S). IN XATEF
Chloroform	5	EM. FACT(S). IN XATEF
Chromium	12	EM. FACT(S). IN XATEF
Cobalt	6	EM. FACT(S). IN XATEF
Copper	11	EM. FACT(S). IN XATEF
1,4-Dichlorobenzene	5	EM. FACT(S). IN XATEF
1,1-Dichloroethane	2	EM. FACT(S). IN XATEF
2,4-Dimethylphenol	2	EM. FACT(S). IN XATEF
4,6-Dinitro-o-cresol	2	EM. FACT(S). IN XATEF
2,4-Dinitrophenol	1	EM. FACT(S). IN XATEF
Chloroethane	3	EM. FACT(S). IN XATEF
Ethylbenzene	5	EM. FACT(S). IN XATEF
1,2-Dichloroethane	4	EM. FACT(S). IN XATEF
Dioctyl phthalate	4	EM. FACT(S). IN XATEF
Hydrogen chloride	2	EM. FACT(S). IN XATEF
Lead	9	EM. FACT(S). IN XATEF
Manganese	10	EM. FACT(S). IN XATEF
Mercury	2	EM. FACT(S). IN XATEF
Bromomethane	1	EM. FACT(S). IN XATEF
Chloromethane	1	EM. FACT(S). IN XATEF
1,1,1-Trichloroethane	5	EM. FACT(S). IN XATEF
Methyl ethyl ketone	4	EM. FACT(S). IN XATEF
Methylene chloride	5	EM. FACT(S). IN XATEF

Naphthalene	3 EM. FACT(S). IN XATEF
2-Nitrophenol	4 EM. FACT(S). IN XATEF
Pentachlorophenol (PCP)	2 EM. FACT(S). IN XATEF
Tetrachloroethylene	5 EM. FACT(S). IN XATEF
Phosphorus (yellow or white)	6 EM. FACT(S). IN XATEF
Polychlorinated biphenyls (PCBs)	3 EM. FACT(S). IN XATEF
Selenium	5 EM. FACT(S). IN XATEF
Silver	6 EM. FACT(S). IN XATEF
Toluene	5 EM. FACT(S). IN XATEF
1,2,4-Trichlorobenzene	2 EM. FACT(S). IN XATEF
Trichloroethylene	5 EM. FACT(S). IN XATEF
2,4,6-Trichlorophenol	2 EM. FACT(S). IN XATEF
Vanadium	6 EM. FACT(S). IN XATEF
Vinyl chloride	4 EM. FACT(S). IN XATEF
Vinylidene chloride	3 EM. FACT(S). IN XATEF
Zinc	11 EM. FACT(S). IN XATEF
2-Chlorophenol	2 EM. FACT(S). IN XATEF
Tin	6 EM. FACT(S). IN XATEF
Titanium	6 EM. FACT(S). IN XATEF
4-Methyl-2-nitrophenol	2 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzo-p-dioxin	3 EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	4 EM. FACT(S). IN XATEF
Monochlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Dichlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Trichlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	4 EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	4 EM. FACT(S). IN XATEF
1,2-Dichloroethylene, (e)-	2 EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	3 EM. FACT(S). IN XATEF
Hexachlorodibenzofurans, total	3 EM. FACT(S). IN XATEF
Hexachlorodibenzo-p-dioxins, total	3 EM. FACT(S). IN XATEF
Heptachlorodibenzo-p-dioxins, total	3 EM. FACT(S). IN XATEF
Pentachlorodibenzo-p-dioxins, total	3 EM. FACT(S). IN XATEF
Octachlorodibenzo-p-dioxins, total	3 EM. FACT(S). IN XATEF
Pentachlorodibenzofurans, total	3 EM. FACT(S). IN XATEF
Octachlorodibenzofurans, total	3 EM. FACT(S). IN XATEF
2,4-Dichlorophenol	2 EM. FACT(S). IN XATEF
Phenol	5 EM. FACT(S). IN XATEF
1,3-Dichlorobenzene	3 EM. FACT(S). IN XATEF
4-Nitrophenol	2 EM. FACT(S). IN XATEF
1,2-Dichlorobenzene	5 EM. FACT(S). IN XATEF
Xylenes (mixed isomers)	3 EM. FACT(S). IN XATEF
Nickel	15 EM. FACT(S). IN XATEF
Silicon	2 EM. FACT(S). IN XATEF
Iron	8 EM. FACT(S). IN XATEF
Calcium	6 EM. FACT(S). IN XATEF
Potassium	2 EM. FACT(S). IN XATEF
1,2-Xylene	2 EM. FACT(S). IN XATEF
Dichlorodibenzodioxins, total	1 EM. FACT(S). IN XATEF
Magnesium	6 EM. FACT(S). IN XATEF
Trichlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Sodium	6 EM. FACT(S). IN XATEF
Dichlorodibenzo-p-dioxin	1 EM. FACT(S). IN XATEF
Gold	2 EM. FACT(S). IN XATEF

50100599 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 501005 SEE ABOVE

50200101 SOLID WASTE DISPL COMMERCL/INSTITNL INCINERATION-GENL MULTIPLE CHAMBER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

50200102 SOLID WASTE DISPL COMMERCL/INSTITNL INCINERATION-GENL SINGLE CHAMBER
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

50200103 SOLID WASTE DISPL COMMERCL/INSTITNL INCINERATION-GENL CONTROLLED AIR
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

50200505 SOLID WASTE DISPL COMMERCL/INSTITNL INCINERATION-SPCL PATHOLOGICAL
8-DIGIT SCC-CODE MATCH

Arsenic	1 EM. FACT(S). IN XATEF
Benzene	1 EM. FACT(S). IN XATEF
Cadmium	1 EM. FACT(S). IN XATEF
Carbon tetrachloride	1 EM. FACT(S). IN XATEF
Chromium	1 EM. FACT(S). IN XATEF
1,1,2-Trichloro-1,2,2-trifluoroethane	1 EM. FACT(S). IN XATEF
Hydrogen chloride	14 EM. FACT(S). IN XATEF
Manganese	1 EM. FACT(S). IN XATEF
Tetrachloroethylene	1 EM. FACT(S). IN XATEF
Trichloroethylene	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Polychlorinated dibenzofurans, total	3 EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Hexachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Hexachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Heptachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total	3 EM. FACT(S). IN XATEF
Pentachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Octachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Pentachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Octachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Nickel	1 EM. FACT(S). IN XATEF

50200591 SCC DESCRIPTION NOT FOUND IN XATEF
NO 8- OR 6-DIGIT MATCH FOUND IN XATEF EM. FACT. FILE

50300101 SOLID WASTE DISPL INDUSTRIAL INCINERATION MULTIPLE CHAMBER
8-DIGIT SCC-CODE MATCH

2,3,7,8-Tetrachlorodibenzo-p-dioxin	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Polychlorinated dibenzofurans, total	1 EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Hexachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Hexachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Heptachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Pentachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Octachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Pentachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Octachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF

50300102 SOLID WASTE DISPL INDUSTRIAL INCINERATION SINGLE CHAMBER
6-DIGIT SCC-CODE MATCH 503001

Hydrogen chloride	1 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF

Polychlorinated dibenzofurans, total	2 EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Hexachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Hexachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Heptachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Pentachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Octachlorodibenzo-p-dioxins, total	1 EM. FACT(S). IN XATEF
Pentachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF
Octachlorodibenzofurans, total	1 EM. FACT(S). IN XATEF

50300103 SOLID WASTE DISPL INDUSTRIAL INCINERATION CONTROLLED AIR
8-DIGIT SCC-CODE MATCH

Anthracene	2 EM. FACT(S). IN XATEF
Benzo(a)pyrene	2 EM. FACT(S). IN XATEF
Polychlorinated biphenyls (PCBs)	1 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
2,3,7,8-Tetrachlorodibenzofuran	1 EM. FACT(S). IN XATEF
Tetrachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Polychlorinated dibenzofurans, total	2 EM. FACT(S). IN XATEF
Heptachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Hexachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Hexachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Heptachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Polychlorinated dibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Pentachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Octachlorodibenzo-p-dioxins, total	2 EM. FACT(S). IN XATEF
Pentachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Octachlorodibenzofurans, total	2 EM. FACT(S). IN XATEF
Acenaphthene	1 EM. FACT(S). IN XATEF
Acenaphthylene	1 EM. FACT(S). IN XATEF
Benz(a)anthracene	1 EM. FACT(S). IN XATEF
Benzo(ghi)perylene	2 EM. FACT(S). IN XATEF
Dibenz(a,h)anthracene	1 EM. FACT(S). IN XATEF
Fluoranthene	1 EM. FACT(S). IN XATEF
Fluorene	2 EM. FACT(S). IN XATEF
Indeno(1,2,3-cd)pyrene	1 EM. FACT(S). IN XATEF
Phenanthrene	2 EM. FACT(S). IN XATEF
Pyrene	2 EM. FACT(S). IN XATEF
Benzo(e)pyrene	2 EM. FACT(S). IN XATEF
Benzofluoranthenes	1 EM. FACT(S). IN XATEF
Coronene	2 EM. FACT(S). IN XATEF
Methylanthracenes	1 EM. FACT(S). IN XATEF
Methylphenanthrenes	1 EM. FACT(S). IN XATEF
Perylene	2 EM. FACT(S). IN XATEF

50300106 SOLID WASTE DISPL INDUSTRIAL INCINERATION TRENCH BURNR WOOD
6-DIGIT SCC-CODE MATCH 503001 SEE ABOVE

50300109 SOLID WASTE DISPL INDUSTRIAL INCINERATION TRNCH BRNR REFUSE
6-DIGIT SCC-CODE MATCH 503001 SEE ABOVE

50300195 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 503001 SEE ABOVE

50300196 SCC DESCRIPTION NOT FOUND IN XATEF
6-DIGIT SCC-CODE MATCH 503001 SEE ABOVE

50300201 SOLID WASTE DISPL INDUSTRIAL OPEN BURNING WOOD/VEG/LEAVES

8-DIGIT SCC-CODE MATCH

Acetaldehyde	1 EM. FACT(S). IN XATEF
Polycyclic organic matter	2 EM. FACT(S). IN XATEF

50300202 SOLID WASTE DISPL INDUSTRIAL OPEN BURNING REFUSE

8-DIGIT SCC-CODE MATCH

Polycyclic organic matter	1 EM. FACT(S). IN XATEF

APPENDIX II

RECOMMENDED LIST OF CHEMICALS TO BE USED IN AIR TOXICS INVENTORY

RECOMMENDED LIST OF AIR-TOXICS

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
1,1,1-trichloroethane	71-55-6	Y
1,1,1-trichloropropane	7789-89-1	Y
1,1,2,2-tetrachloroethane	79-34-5	Y
1,1,2-trichloroethane	79-00-5	
1,1-dichloroethane	75-34-3	Y
1,2,3,4,6,7,8,9-octachlorodibenzodioxin	3268-87-9	Y
1,2,3,4,6,7,8,9-octachlorodibenzofuran	39001-02-0	Y
1,2,3,4,6,7,8-heptachlorodibenzodioxin	TEMP-00-1	Y
1,2,3,4,6,7,8-heptachlorodibenzofuran	TEMP-00-8	Y
1,2,3,4,7,8,9-heptachlorodibenzofuran	TEMP-10-1	Y
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	57653-85-7	Y
1,2,3,4,7,8-hexachlorodibenzofuran	TEMP-00-4	Y
1,2,3,4-tetrachlorobenzene	634-66-2	Y
1,2,3,5-tetrachlorobenzene	634-90-2	
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	34465-46-8	Y
1,2,3,6,7,8-hexachlorodibenzofuran	TEMP-00-5	Y
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	19408-74-3	Y
1,2,3,7,8,9-hexachlorodibenzofuran	TEMP-00-6	Y
1,2,3,7,8-pentachlorodibenzo-p-dioxin	40321-76-4	Y
1,2,3,7,8-pentachlorodibenzofuran	TEMP-00-3	Y
1,2,3-trichlorobenzene	87-61-6	Y
1,2,4,5-tetrachlorobenzene	95-94-3	Y
1,2,4-trichlorobenzene	120-82-1	Y
1,2,4-trimethylbenzene	95-63-6	
1,2-butylene oxide	106-88-7	
1,2-dibromoethane	106-93-4	Y
1,2-dichlorobenzene	95-50-1	Y
1,2-dichloroethane	107-06-2	Y
1,2-dichloroethylene, (e)-	156-60-5	Y
1,2-dichloroethylene, (z)-	156-59-2	Y
1,2-dichloropropane	78-87-5	Y
1,2-diphenylhydrazine	122-66-7	
1,2-propadiene	463-49-0	Y
1,3,5-trichlorobenzene	108-70-3	
1,3-butadiene	106-99-0	Y
1,3-cyclopentadiene	542-92-7	Y
1,3-dichlorobenzene	541-73-1	Y
1,3-dichloropropene	542-75-6	Y
1,3-pentadiene	504-60-9	Y
1,4-dichlorobenzene	106-46-7	Y
1,4-dioxane	123-91-1	
1,4-naphthoquinone	130-15-4	Y
1,8-dinitropyrene	42397-65-9	
1-bromo-2,4-dinitrobenzene	584-48-5	Y
1-chloronaphthalene	90-13-1	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
1-hexene	592-41-6	Y
1-methoxy-2-propanol	107-98-2	Y
1-methyl-1-cyclohexene	591-49-1	Y
1-methylnaphthalene	90-12-0	Y
1-nitropyrene	5522-43-0	Y
10-monoh-mirex	TEMP-05-2	
2,2 butoxyethoxy ethanol	112-34-5	
2,3,4,5-tetrachlorophenol	4901-51-3	
2,3,4,6,7,8,9-heptachlorodibenzofuran	TEMP-00-9	Y
2,3,4,6,7,8-hexachlorodibenzofuran	TEMP-00-7	Y
2,3,4,6-tetrachlorophenol	58-90-2	
2,3,4,6-tetrachlorophenol	TEMP-03-1	Y
2,3,4,7,8-pentachlorodibenzofuran	57117-31-4	Y
2,3,4-trichlorophenol	TEMP-02-9	Y
2,3,5-trichlorophenol	TEMP-02-8	Y
2,3,6-trichlorophenol	TEMP-02-7	Y
2,3,7,8-tetrachlorodibenzo-p-dioxin	1746-01-6	Y
2,3,7,8-tetrachlorodibenzofuran	TEMP-00-2	Y
2,3-dichlorophenol	TEMP-02-5	Y
2,4,5-trichlorophenol	95-95-4	
2,4,5-trichlorophenoxyacetic acid	93-76-5	
2,4,5-trichlorotoluene	6639-30-1	
2,4,6-trichlorophenol	88-06-2	Y
2,4-diaminotoluene	95-80-7	
2,4-dichloro-6-nitroaniline	2683-43-4	Y
2,4-dichlorophenol	120-83-2	Y
2,4-dichlorophenoxy-acetic acid	94-75-7	
2,4-dimethylphenol	105-67-9	Y
2,4-dinitrophenol	51-28-5	Y
2,4-dinitrotoluene	121-14-2	
2,6-di-t-butyl-4-methylphenol	128-37-0	
2,6-dichlorophenol	TEMP-02-3	Y
2,6-dinitrotoluene	606-20-2	
2,8-dih-mirex	TEMP-05-3	
2-(2-(2-ethoxyethoxy)ethoxy) ethanol	112-50-5	Y
2-(2-methoxyethoxy) ethanol	111-77-3	Y
2-(2-methyl-4-chlorophenoxy)-propionic acid	7085-19-0	
2-bromo-4,6-dinitroaniline	1817-73-8	Y
2-butanone	TEMP-03-6	Y
2-chlorophenol	95-57-8	Y
2-ethoxyethanol	110-80-5	
2-ethyl hexanal	123-05-7	Y
2-hexanone	TEMP-04-0	Y
2-mercaptobenzothiazole disulfide	120-78-5	
2-methoxyethanol	109-86-4	Y

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
2-methyl-4-chlorophenoxy-acetic acid	94-74-6	
2-methylcholanthrene	TEMP-02-0	Y
2-methylfluorene	TEMP-01-5	Y
2-methylnaphthalene	91-57-6	Y
2-methylpropane	75-28-5	Y
2-nitrophenol	88-75-5	Y
2-nitropropane	79-46-9	
2-phenyl-1-propanol	1123-85-9	Y
2-phenylphenol	90-43-7	
3,3'-dichlorobenzidine	91-94-1	
3,4,5-trichlorophenol	TEMP-03-0	Y
3,4-dichlorophenol	TEMP-02-6	Y
3,5-dichlorophenol	TEMP-02-4	Y
3,5-dimethylaniline	108-69-0	
3-methylbutyraldehyde	590-86-3	Y
3-methylcholanthrene	56-49-5	Y
4,4'-methylenebis(2-chloroaniline)	101-14-4	
4,4'-methylenedianiline	101-77-9	
4,4-isopropylidenediphenol	80-05-7	
4,6-dinitro-o-cresol	534-52-1	Y
4-bromochlorobenzene	106-39-8	Y
4-chlorophenyl phenyl ether	7005-72-3	
4-methyl-2-nitrophenol	119-33-5	Y
4-methyl-2-pentanone	TEMP-03-9	Y
4-nitrophenol	100-02-7	Y
7,12-dimethylbenz(a)anthracene	57-97-6	
7-methylbenzo(a)anthracene	TEMP-01-8	Y
7h-dibenzo(cg)carbazole	194-59-2	Y
acenaphthene	83-32-9	Y
acenaphthylene	208-96-8	Y
acetaldehyde	75-07-0	Y
acetic acid	64-19-7	Y
acetone	67-64-1	Y
acetonitrile	75-05-8	Y
acetophenone	98-86-2	Y
acetylene	74-86-2	Y
acrolein	107-02-8	Y
acrylamide	79-06-1	
acrylic acid	79-10-7	Y
acrylonitrile	107-13-1	Y
adipic acid	124-04-9	Y
alachlor	15972-60-8	
aldehydes	TEMP-05-4	Y
aldrin	309-00-2	Y
alkylated lead	TEMP-09-4	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
allyl alcohol	107-18-6	
allyl chloride	107-05-1	Y
alpha-endosulfan	959-98-9	
alpha-hexachlorocyclohexane	319-84-6	
aluminum	7429-90-5	Y
aluminum oxide (fibrous forms)	1344-28-1	
amines (total)	TEMP-05-6	Y
ammonia	7664-41-7	Y
ammonium chloride	12125-02-9	Y
ammonium nitrate	6484-52-2	
ammonium sulfate	7783-20-2	Y
amyl acetate	123-92-2	
aniline	62-53-3	Y
anthanthrene	TEMP-09-5	
anthracene	120-12-7	Y
anthraquinone	84-65-1	Y
antimony	7440-36-0	Y
arsenic	7440-38-2	Y
arsenic acid	7778-39-4	
asbestos	1332-21-4	Y
atrazine	1912-24-9	
barium	7440-39-3	Y
barium iron oxide	11138-11-7	Y
benz(a)anthracene	56-55-3	Y
benzaldehyde	100-52-7	Y
benzene	71-43-2	Y
benzidine	92-87-5	
benzo(a)fluorene	30777-18-5	Y
benzo(a)pyrene	50-32-8	Y
benzo(b)chrysene	TEMP-02-1	Y
benzo(b)fluoranthene	205-99-2	Y
benzo(b)fluorene	TEMP-01-6	Y
benzo(b+k)fluoranthene	TEMP-04-5	Y
benzo(e)pyrene	192-97-2	Y
benzo(g,h,i)fluoranthene	TEMP-09-6	
benzo(ghi)perylene	191-24-2	Y
benzo(j)fluoranthene	205-82-3	Y
benzo(k)fluoranthene	207-08-9	Y
benzodiazine	TEMP-05-8	Y
benzofluoranthenes	56832-73-6	Y
benzofuran	271-89-6	Y
benzoic acid	65-85-0	Y
benzoic acid, butyl ester	136-60-7	Y
benzothiophene	95-15-8	Y
benzoyl chloride	98-88-4	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
benzoyl peroxide	94-36-0	
benzyl alcohol	100-51-6	
benzyl chloride	100-44-7	
beryllium	7440-41-7	Y
beta-endosulfan	33213-65-9	
beta-hexachlorocyclohexane	319-85-7	
bibenzyl	103-29-7	Y
biphenyl	92-52-4	Y
bis (2-chloroethyl) ether	111-44-4	Y
bis(2-ethylhexyl) adipate	103-23-1	
bis(chloromethyl)ether	542-88-1	
bismuth	7440-69-9	Y
boron	7440-42-8	Y
boron trifluoride	7637-07-2	
bromine	7726-95-6	Y
bromodichloromethane	75-27-4	Y
bromoform	75-25-2	Y
bromomethane	74-83-9	Y
butane	106-97-8	Y
butyl acrylate	141-32-2	
butyl benzyl phthalate	85-68-7	Y
butylate	2008-41-5	
butylbenzene	104-51-8	Y
butyraldehyde	123-72-8	Y
c.i. acid green 3	4680-78-8	
c.i. basic green 4	569-64-2	
c.i. basic red 1	989-38-8	
c.i. disperse yellow 3	2832-40-8	
c.i. food red 15	81-88-9	
c.i. solvent orange 7	3118-97-6	
c.i. solvent yellow 14	842-07-9	
cadmium	7440-43-9	Y
calcium	7440-70-2	Y
calcium carbide	75-20-7	
calcium cyanamide	156-62-7	
calcium cyanide	592-01-8	
calcium hydroxide	1305-62-0	
calcium hypochlorite	7778-54-2	
calcium oxide	1305-78-8	
caprolactam	105-60-2	Y
carbazole	86-74-8	Y
carbofuran	1563-66-2	
carbon disulfide	75-15-0	Y
carbon monoxide	630-08-0	Y
carbon tetrachloride	56-23-5	Y

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
carbonyl sulfide	463-58-1	Y
catechol	120-80-9	
cerium	7440-45-1	Y
cesium	7440-46-2	Y
chlordane	54-74-9	
chlorinated paraffin waxes	61788-76-9	
chlorine	7782-50-5	Y
chlorine dioxide	10049-04-4	
chloroacetic acid	79-11-8	
chlorobenzene	108-90-7	Y
chlorobenzenes	TEMP-04-2	Y
chlorodibromomethane	124-48-1	
chloroethane	75-00-3	Y
chloroform	67-66-3	Y
chloromethane	74-87-3	Y
chloromethyl methyl ether	107-30-2	
chlorophenol	25167-80-0	Y
chlorophenols	TEMP-04-3	Y
chloroprene	126-99-8	Y
chlorpyrifos	2921-88-2	
chromic acid	7738-94-5	
chromium	7440-47-3	Y
chromium (iii)	16065-83-1	Y
chromium (vi)	18540-29-9	Y
chromium (vi) oxide (1:3)	1333-82-0	Y
chrysene	218-01-9	Y
chrysene and triphenylene	TEMP-04-4	Y
cis-1,3-dichloropropylene	TEMP-03-7	Y
cis-chlordane	5103-71-9	
coal tar creosote	8001-58-9	Y
cobalt	7440-48-4	Y
copper	7440-50-8	Y
copper oxide	1317-38-0	Y
coronene	191-07-1	Y
cresol (mixed isomers)	1319-77-3	
crotylaldehyde	4170-30-3	Y
cumene	98-82-8	Y
cumene hydroperoxide	80-15-9	
cupric sulfate	7758-98-7	
cyanazine	21725-46-2	
cyanide	57-12-5	Y
cyclohexane	110-82-7	
cyclopenta(cd)pyrene	27208-37-3	Y
ddt and metabolites	50-29-3	
decabromodiphenyl oxide	1163-19-5	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
decachlorobiphenyls	TEMP-01-4	Y
dehydroabietic acid	1740-19-8	
di-(2-ethylhexyl) phthalate	117-81-7	Y
diazinon	333-41-5	
dibenz(a,h)acridine	224-42-0	Y
dibenz(a,h)anthracene	53-70-3	Y
dibenzanthracenes	TEMP-06-2	Y
dibenzo(a,c)&(a,h)anthracene	TEMP-05-0	Y
dibenzo(a,c)anthracene	TEMP-09-7	
dibenzo(a,i)pyrene	189-55-9	
dibenzofuran	132-64-9	Y
dibenzothiophene	132-65-0	Y
dibutyl phthalate	84-74-2	Y
dibutyltin dilaurate	77-58-7	
dicamba	1918-00-9	
dichlorobenzene (mixed isomers)	25321-22-6	Y
dichlorobiphenyls	TEMP-01-0	Y
dichlorodibenzodioxins, total	TEMP-06-3	Y
dichlorodibenzofurans, total	TEMP-06-4	Y
dichloromethane	75-09-2	Y
dichloropropane	26638-19-7	Y
dieldrin	60-57-1	
diethanolamine	111-42-2	
diethyl ether (ethyl ether)	60-29-7	
diethyl phthalate	84-66-2	Y
diethyl sulfate	64-67-5	
diethylamine	109-89-7	
dihydroindene	496-11-7	Y
dimethyl disulfide	624-92-0	
dimethyl phenol (xylenol)	1300-71-6	
dimethyl phthalate	131-11-3	Y
dimethyl sulfate	77-78-1	
dimethyl sulfide	75-18-3	
dimethylamine	124-40-3	
dimethylformamide, n,n-	68-12-2	Y
dimethylstyrene	27576-03-0	Y
dinitrotoluene (mixed isomers)	25321-14-6	
diphenyl ether	101-84-8	Y
diphenylamine	122-39-4	
dipropyl phthalate	131-16-8	Y
divinyl benzene, (mixed isomers)	1321-74-0	Y
dodecachloropentacyclodecane	TEMP-09-8	
dodecyl benzene sulfonic acid	1886-81-3	
endosulfan	115-29-7	
endosulfan sulfate	1031-07-8	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
endrin	72-20-8	
epichlorohydrin	106-89-8	Y
ethane	74-84-0	Y
ethanol	64-17-5	Y
ethion	563-12-2	
ethyl acrylate	140-88-5	Y
ethyl chloroformate	541-41-3	
ethyl styrene	28106-30-1	Y
ethylbenzene	100-41-4	Y
ethylene	74-85-1	Y
ethylene glycol	107-21-1	Y
ethylene oxide	75-21-8	Y
ethylene thiourea	96-45-7	
ethylenediaminetetraacetic acid (edta)	60-00-4	
europium	7440-53-1	Y
fluoranthene	206-44-0	Y
fluorene	86-73-7	Y
fluoride	16984-48-8	Y
fluorine	7782-41-4	Y
fonophos	944-22-9	
formaldehyde	50-00-0	Y
formic acid	64-18-6	
furan	110-00-9	
furfural	98-01-1	
gallium	7440-55-3	Y
gamma-hexachlorocyclohexane	58-89-9	
germanium	7440-56-4	Y
gold	7440-57-5	Y
heptachlor	76-44-8	
heptachlor epoxide	1024-57-3	
heptachlorinated dibenzo-p-dioxins, total	38871-00-4	
heptachlorinated dibenzofurans, total	38998-75-3	
heptachlorobiphenyls, total	28655-71-2	Y
hexachlorinated dibenzofurans	55684-94-1	
hexachloro-1,3-butadiene	87-68-3	
hexachlorobenzene	118-74-1	Y
hexachlorobiphenyls, total	26601-64-9	Y
hexachlorocyclohexane	608-73-1	
hexachlorocyclopentadiene	77-47-4	Y
hexachlorodibenzo-p-dioxins, total	TEMP-06-8	Y
hexachloroethane	67-72-1	
hydrazine	302-01-2	
hydrochloric acid	7647-01-0	Y
hydrogen cyanide	74-90-8	Y
hydrogen fluoride	7664-39-3	Y

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
hydrogen sulfide	7783-06-4	Y
hydroquinone	123-31-9	
indene	95-13-6	Y
indeno(1,2,3-cd)pyrene	193-39-5	Y
inorganic fluorides	TEMP-07-0	
iron	15438-31-0	Y
isobutyraldehyde	78-84-2	Y
isoprene	78-79-5	
isopropyl alcohol	67-63-0	
isosafrole	120-58-1	
ketones	TEMP-07-1	Y
lanthanum	7439-91-0	Y
lead	7439-92-1	Y
lead oxide	1317-36-8	Y
limonene	138-86-3	Y
linuron	330-55-2	
lithium	7439-93-2	Y
m-&p-xylenes	TEMP-05-1	Y
m-cresol	108-39-4	
m-xylene	108-38-3	Y
magnesium	7439-95-4	Y
malathion	121-75-5	
maleic anhydride	108-31-6	Y
manganese	7439-96-5	Y
manganese oxide	1317-34-6	Y
mercury	7439-97-6	Y
methane	74-82-8	
methanol	67-56-1	Y
methoxychlor	72-43-5	
methyl acetate	79-20-9	Y
methyl acrylate	96-33-3	
methyl ethyl ketone	78-93-3	Y
methyl iodide	74-88-4	
methyl isobutyl ketone	108-10-1	
methyl mercaptan	74-93-1	
methyl methacrylate	80-62-6	Y
methyl tert-butyl ether	1634-04-4	
methyl thiophene	TEMP-07-2	Y
methylanthracenes	26914-18-1	Y
methylenebis (phenylisocyanate)	101-68-8	
methylnaphthalene	1321-94-4	Y
methylphenanthrenes	31711-53-2	Y
methylstyrene	25013-15-4	Y
metolachlor	51218-45-2	
metribuzin	21087-64-9	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
michler's ketone	90-94-8	
mineral fibres	TEMP-07-3	
mirex	2385-85-5	
molybdenum	7439-98-7	Y
molybdenum trioxide	1313-27-5	
monochlorodibenzofurans, total	TEMP-07-4	Y
monomethylamine	74-89-5	
n,n-dimethylaniline	121-69-7	
n-butyl acetate	123-86-4	
n-butyl alcohol	71-36-3	Y
n-butylamine	109-73-9	
n-dioctyl phthalate	117-84-0	
n-hexane	110-54-3	
n-nitrosodiphenylamine	86-30-6	
naphthalene	91-20-3	Y
neodymium	7440-00-8	Y
nickel	7440-02-0	Y
nickel(ii) oxidé (1:1)	1313-99-1	Y
niobium	7440-03-1	Y
nitric acid	7697-37-2	
nitrilotriacetic acid	139-13-9	
nitrobenzene	98-95-3	Y
nitroglycerin	55-63-0	
nonachlorobiphenyls	TEMP-01-3	Y
o,p'-ddd	53-19-0	
o,p'-dde	3424-82-6	
o,p'-ddt	789-02-6	
o-cresol	95-48-7	Y
o-xylene	95-47-6	Y
octachlorobiphenyls	TEMP-01-2	Y
octachlorostyrene	29082-74-4	
oleic acid	112-80-1	
organotin compounds	TEMP-07-7	
oxychlordane	27304-13-8	
p,p'-ddd	74-54-8	
p,p'-dde	72-55-9	
p,p'-ddmu	1022-22-6	
p-cresol	106-44-5	Y
p-phenylenediamine	106-50-3	
p-quinone	106-51-4	
p-xylene	106-42-3	Y
palladium	7440-05-3	
palustric acid	1945-53-5	
particulate matter - forest fires	TEMP-07-8	Y
pendimethalin	40487-42-1	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
pentachlorobenzene	608-93-5	
pentachlorobiphenyls, total	25429-29-2	Y
pentachlorodibenzo-p-dioxins, total	36088-22-9	
pentachlorodibenzofurans, total	30402-15-4	
pentachlorophenol (pcp)	87-86-5	Y
peracetic acid	79-21-0	
perylene	198-55-0	Y
phenanthrene	85-01-8	Y
phenol	108-95-2	Y
phenols	TEMP-08-1	Y
phosgene	75-44-5	Y
phosphoric acid	7664-38-2	
phosphorus (yellow or white)	7723-14-0	Y
phosphorus oxychloride	10025-87-3	
photomirex	39801-14-4	
phthalic acid esters	TEMP-08-2	
phthalic anhydride	85-44-9	Y
platinum	7440-06-4	Y
polybrominated biphenyls	59536-65-1	
polychlorinated biphenyls (pcbs)	1336-36-3	Y
polychlorinated dibenzo-p-dioxins, total	TEMP-08-3	Y
polychlorinated dibenzofurans, total	TEMP-08-4	Y
polychlorinated terphenyls	TEMP-10-2	
polycyclic organic matter	TEMP-08-5	Y
polydimethyl siloxane	9016-00-6	Y
potassium	7440-09-7	Y
potassium cyanide	151-50-8	
potassium hydroxide	1310-58-3	
praseodymium	7440-10-0	Y
primary sulfate	TEMP-08-6	Y
propane	74-98-6	Y
propionaldehyde	123-38-6	Y
propionic acid	79-09-4	
propionic anhydride	123-62-6	
propyl alcohol	71-23-8	Y
propyl benzene	103-65-1	Y
propylene	115-07-1	Y
propylene oxide	75-56-9	Y
pyrene	129-00-0	Y
pyridine	110-86-1	
quinoline	91-22-5	
rubidium	7440-17-7	Y
s-ethyl dipropylthiocarbamate	759-94-4	
saccharin (manufacture only)	81-07-2	Y
safrole	94-59-7	

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
samarium	7440-19-9	Y
scandium	7440-20-2	Y
sec-butyl alcohol	78-92-2	Y
selenium	7782-49-2	Y
silicon	7440-21-3	Y
silicon tetrafluoride	7783-61-1	Y
silver	7440-22-4	Y
silvex (2,4,5-tp)	93-72-1	
sodium	7440-23-5	Y
sodium bichromate (sodium dichromate)	10588-01-9	
sodium bisulfite	7631-90-5	
sodium chlorate	7775-09-9	Y
sodium cyanide	143-33-9	
sodium hydroxide	1310-73-2	Y
strontium	7440-24-6	Y
styrene	100-42-5	Y
styrene oxide	96-09-3	
sulfur	7704-34-9	Y
sulfur chloride	10025-67-9	Y
sulfur trioxide	7446-11-9	Y
sulfuric acid	7664-93-9	Y
sulphur dioxide	7446-09-5	
sulphur hexafluoride	2551-62-4	
tellurium	13494-80-9	Y
terephthalic acid	100-21-0	Y
tert-butyl alcohol	75-65-0	
tetrachlorobenzenes	TEMP-08-8	Y
tetrachlorobiphenyls, total	26914-33-0	Y
tetrachlorodibenzo-p-dioxins, total	41903-57-5	
tetrachlorodibenzofurans, total	55722-27-5	
tetrachloroethylene	127-18-4	Y
tetrachloroguaiacol	2539-17-5	
tetrachlorophenols	TEMP-10-0	
tetraethyl lead	78-00-2	
tetrahydrofuran	109-99-9	
tetramethylbenzene	TEMP-09-1	Y
thallium	7440-28-0	Y
thiophene	110-02-1	Y
thiourea	62-56-6	
thorium	7440-29-1	Y
thorium dioxide	1314-20-1	
tin	7440-31-5	Y
tin oxide	18282-10-5	Y
titanium	7440-32-6	Y
titanium oxide	13463-67-7	Y

RECOMMENDED LIST OF AIR-TOXICS (CONT.)

CHEMICAL NAME	CAS	EMISSION FACTOR AVAILABLE
titanium tetrachloride	7550-45-0	
toluene	108-88-3	Y
toluene-2,4-diisocyanate	584-84-9	
toluene-2,6-diisocyanate	91-08-7	
toluenediisocyanate (mixed isomers)	26471-62-5	
toxaphene	8001-35-2	
trans-1,3-dichloropropylene	TEMP-03-8	Y
trans-chlordane	5103-74-2	
tributyl tin	688-73-3	
trichlorobenzenes	87-61=6	
trichlorobiphenyls	TEMP-01-1	Y
trichlorodibenzo-p-dioxins, total	TEMP-09-2	Y
trichlorodibenzofurans, total	TEMP-09-3	Y
trichloroethylene	79-01-6	Y
trifluralin	1582-09-8	
trimethylamine	75-50-3	Y
trimethylbenzene (mixed isomers)	25551-13-7	Y
triphenyl phosphate	115-86-6	
triphenylene	217-59-4	Y
trixylyl phosphate	25155-23-1	
tungsten	7440-33-7	Y
uranium	7440-61-1	Y
vanadium	7440-62-2	Y
vanadium oxide	1314-62-1	Y
vinyl acetate	108-05-4	Y
vinyl chloride	75-01-4	Y
vinylidene chloride	75-35-4	Y
xylene (mixed isomers)	1330-20-7	Y
yttrium	7440-65-5	Y
zinc	7440-66-6	Y
zinc oxide	1314-13-2	Y
zirconium	7440-67-7	Y

APPENDIX III

DIOXINS, FURANS, PAHS AND PCBS IN RECOMMENDED AIR TOXICS LIST

DIOXINS IN RECOMMENDED LIST

CHEMICAL NAME	CAS
dichlorodibenzodioxins, total	TEMP-06-3
trichlorodibenzo-p-dioxins, total	TEMP-09-2
2,3,7,8-tetrachlorodibenzo-p-dioxin	1746-01-6
tetrachlorodibenzo-p-dioxins, total	41903-57-5
1,2,3,7,8-pentachlorodibenzo-p-dioxin	40321-76-4
pentachlorodibenzo-p-dioxins, total	36088-22-9
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	57653-85-7
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	34465-46-8
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	19408-74-3
hexachlorodibenzo-p-dioxins, total	TEMP-06-8
1,2,3,4,6,7,8-heptachlorodibenzodioxin	TEMP-00-1
heptachlorinated dibenzo-p-dioxins, total	38871-00-4
1,2,3,4,6,7,8,9-octachlorodibenzodioxin	3268-87-9
polychlorinated dibenzo-p-dioxins, total	TEMP-08-3

FURANS IN RECOMMENDED LIST

CHEMICAL NAME	CAS
dibenzofuran	132-64-9
monochlorodibenzofurans, total	TEMP-07-4
dichlorodibenzofurans, total	TEMP-06-4
trichlorodibenzofurans, total	TEMP-09-3
2,3,7,8-tetrachlorodibenzofuran	TEMP-00-2
tetrachlorodibenzofurans, total	55722-27-5
1,2,3,7,8-pentachlorodibenzofuran	TEMP-00-3
2,3,4,7,8-pentachlorodibenzofuran	57117-31-4
pentachlorodibenzofurans, total	30402-15-4
1,2,3,4,7,8-hexachlorodibenzofuran	TEMP-00-4
1,2,3,6,7,8-hexachlorodibenzofuran	TEMP-00-5
1,2,3,7,8,9-hexachlorodibenzofuran	TEMP-00-6
2,3,4,6,7,8-hexachlorodibenzofuran	TEMP-00-7
hexachlorinated dibenzofurans, total	55684-94-1
1,2,3,4,6,7,8-heptachlorodibenzofuran	TEMP-00-8
1,2,3,4,7,8,9-heptachlorodibenzofuran	TEMP-10-1
2,3,4,6,7,8,9-heptachlorodibenzofuran	TEMP-00-9
heptachlorinated dibenzofurans, total	38998-75-3
1,2,3,4,6,7,8,9-octachlorodibenzofuran	39001-02-0
polychlorinated dibenzofurans, total	TEMP-08-4

PAHs IN RECOMMENDED LIST

CHEMICAL NAME	CAS
1-methylnaphthalene	90-12-0
2-methylcholanthrene	TEMP-02-0
2-methylfluorene	TEMP-01-5
2-methylnaphthalene	91-57-6
3-methylcholanthrene	56-49-5
7,12-dimethylbenz(a)anthracene	57-97-6
7-methylbenzo(a)anthracene	TEMP-01-8
acenaphthene	83-32-9
acenaphthylene	208-96-8
anthanthrene	TEMP-09-5
anthracene	120-12-7
benz(a)anthracene	56-55-3
benzo(a)fluorene	30777-18-5
benzo(a)pyrene	50-32-8
benzo(b)chrysene	TEMP-02-1
benzo(b)fluoranthene	205-99-2
benzo(b)fluorene	TEMP-01-6
benzo(b+k)fluoranthene	TEMP-04-5
benzo(e)pyrene	192-97-2
benzo(g,h,i)fluoranthene	TEMP-09-6
benzo(ghi)perylene	191-24-2
benzo(j)fluoranthene	205-82-3
benzo(k)fluoranthene	207-08-9
benzofluoranthenes	56832-73-6
chrysene	218-01-9
chrysene and triphenylene	TEMP-04-4
cyclopenta(cd)pyrene	27208-37-3
dibenz(a,h)acridine	224-42-0
dibenz(a,h)anthracene	53-70-3
dibenzanthracenes	TEMP-06-2
dibenzo(a,c)&(a,h)anthracene	TEMP-05-0
dibenzo(a,c)anthracene	TEMP-09-7
dibenzo(a,i)pyrene	189-55-9
fluoranthene	206-44-0
fluorene	86-73-7
indeno(1,2,3-cd)pyrene	193-39-5
methylanthracenes	26914-18-1
methylnaphthalene	1321-94-4
methylphenanthrenes	31711-53-2
naphthalene	91-20-3
perylene	198-55-0
phenanthrene	85-01-8
polycyclic organic matter	TEMP-08-5
pyrene	129-00-0
triphenylene	217-59-4

PCBs IN RECOMMENDED LIST

CHEMICAL NAME	CAS
dichlorobiphenyls, total	TEMP-01-0
trichlorobiphenyls, total	TEMP-01-1
tetrachlorobiphenyls, total	26914-33-0
pentachlorobiphenyls, total	25429-29-2
hexachlorobiphenyls, total	26601-64-9
heptachlorobiphenyls, total	28655-71-2
octachlorobiphenyls, total	TEMP-01-2
nonachlorobiphenyls, total	TEMP-01-3
decachlorobiphenyls, total	TEMP-01-4
polychlorinated biphenyls, total	1336-36-3