South Coast Air Quality Management District

Supplemental Instructions

2006-2007 Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory

Annual Emissions Reporting Program

June 2007

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Background

In 1987, the California legislature adopted the Air Toxics "Hot Spots" Information and Assessment Act; also known as Assembly Bill 2588 (or AB2588). The goals of the Act are to collect emissions data, identify facilities having localized impacts to determine health risks, and notify affected individuals. Facilities in the AB2588 Program are required to report their toxics emissions to the AQMD quadrennially (i.e., once every four years). Beginning with the FY 2000-01 reporting cycle, toxics emission reporting for the AB2588 Program was incorporated into the AQMD's AER Program. Currently, there are approximately 700 AB2588 facilities which are grouped into four phases for reporting purposes (i.e., Phase 1A, 1B, 2, and 3). The schedule of toxic inventory update for each phase is as follows: Phase 2 – 2005, Phase 3 – 2006, Phase 1A – 2007, and Phase 1B – 2008.

In addition to the toxics emissions reported by AB2588 facilities, facilities emitting any of the 24 toxic air contaminants (TAC) or ozone depleting compounds (ODC) specified in District's Rule 301(e) are also required to report these emissions annually to the District under the Annual Emissions Report (AER) Program and pay the corresponding emission fees. The list of compounds and their corresponding fees are given in Table 1.

Table 1. Rule 301(e) Toxic Air Contaminants and Ozone Depleters.

Toxic Compound	**Fee ($/1 lb)**
Ammonia	$0.02
Asbestos*	$4.92
Benzene	$1.65
Cadmium*	$4.92
Carbon tetrachloride	$1.65
Chlorinated dioxins and dibenzofurans	$8.19
Ethylene dibromide	$1.65
Ethylene dichloride	$1.65
Ethylene oxide	$1.65
Formaldehyde	$0.35
Hexavalent chromium*	$6.56
Methylene chloride	$0.07
Nickel*	$3.25
Perchloroethylene	$0.35
1,3 Butadiene	$4.92
Inorganic arsenic*	$4.92
Beryllium*	$4.92
Polynuclear aromatic hydrocarbons (PAHs)	$4.92
Vinyl chloride	$1.65
Lead*	$1.65
1,4-Dioxane	$0.35
Trichloroethylene	$0.15
Chlorofluorocarbons (CFCs)**	$0.30
1,1,1-Trichloroethane**	$0.05

* Particulate toxic air contaminant ** Ozone depleting compound

For the reporting period, July 1, 2006 to June 30, 2007, Phase 1A facilities are required to submit their complete quadrennial toxics emission inventory to the District. The Phase 1A facilities will be prioritized from the information in their quadrennial inventory and facilities with a priority score[1] greater than ten (10) may be required to prepare a health risk assessment (HRA) using the "Hot Spots" Analysis and Reporting Program (HARP).[2] (A facility that has previously prepared a HRA that reflects the actual risks associated with the facility may not be required to prepare a new HRA.) The first step a facility takes when preparing their HRA using HARP will be to input facility information including a detailed toxics emission inventory by device along with source parameter and location information. Facilities will have to re-enter much of their toxic emissions through HARP, but that is necessary in order to prepare the HRA. There is currently no mechanism to upload AER data into HARP.

Reporting Procedures for AB2588 Facilities

The following is a summary of procedures for AB2588 facilities for reporting their quadrennial toxics emissions inventory to the District:

- Reporting of toxic emissions is performed under the District's AER Program.

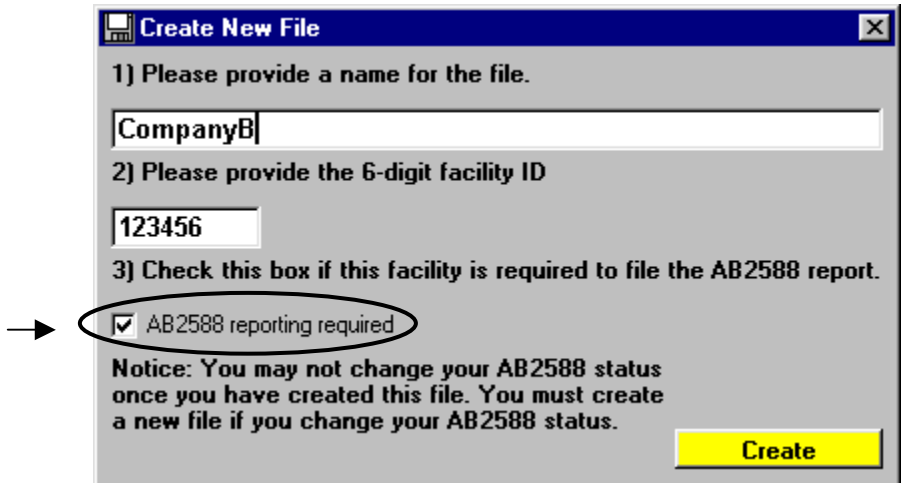
- The reporting cycle is based on fiscal year (i.e., July 1 to June 30) rather than calendar year to be consistent with the AER Program. Accordingly, the new schedule for toxic inventory reports for each phase is as follows: Phase 2 - FY 2004/2005, Phase 3 – FY 2005/2006, Phase 1A – FY 2006/2007, and Phase 1B – FY 2007/2008.

- Streamlined AB2588 reporting process:
  - For a list of applicable toxics (177 substances), refer to Appendix A.
  - Reporting software is available for reporting emissions in the AER Program, which significantly simplifies the reporting process and reduces potential reporting errors for AB2588 facilities. Use of software is strongly encouraged, however, paper forms will also be made available for facilities electing not to use the software.

[1] Priority score is a facility's position on a scale representing potential health risks. The priority score is determined by an algorithm that considers potency, toxicity, quantity, and volume of hazardous material released from the facility; and the proximity of the facility to potential receptors. The District's prioritization procedures are available at: http://www.aqmd.gov/prdas/AB2588/AB2588.html.

[2] HARP is a single integrated analysis tool that streamlines the emission inventory and risk assessment requirements of the AB2588 Program.

If you are using the software reporting option, when creating your facility file MAKE SURE to identify your facility as an AB2588 facility reporting its quadrennial toxic inventory by marking the check box for "AB2588 reporting required", as illustrated below:



  - Facilities will report their toxic emissions based on the emission categories identified in the AER Program.
  - Stack parameters and operating profile by equipment do not need to be reported. The District, however, may request this information at a later time, if necessary.

- Under the AER Program, AB2588 facilities are also required to report the corresponding criteria pollutant emissions on the applicable forms and pay corresponding emissions fees if they exceed the thresholds. As specified in District's Rule 301(e), facilities emitting 4 tons or more of reactive organic gases (ROG), oxides of nitrogen (NO_X), oxides of sulfur (SO_X), specific organics (SPOG), and particulate matter (PM) or emitting 100 tons or more of carbon monoxide (CO) are required to pay emission fees based on the total weight of emissions.
- This reporting package mailed to Phase 1A AB2588 facilities shall be submitted by **August 30, 2007.**
- During the sixty (60) days allowed for filing the report, the District will conduct public outreach through informational workshops and public assistance through telephone hotline, fax, e-mail, and Internet to assist facilities in filing their reports. The program support will be provided by District's contractor, Ecotek, as well as District staff. In addition, individual appointments may be arranged with Ecotek or District staff for one-on-one consultation. Refer to the General Instruction Book provided in your package for a workshop schedule (page 8) and the available program support (page 9).
- The toxics emissions data submitted by facilities will be used for determining whether a health risk assessment needs to be conducted or an existing one to be revised.
- The District maintains the right to review and audit the reported data and request additional data for clarification, if necessary.
- Please refer to the General Instruction Book for the FY 2006-2007 AER Program for more detailed program updates, software instructions, what to submit, frequently asked questions, and other helpful program information.

Recommendations

- Carefully review the reporting package provided to you before attending the July workshops.
- Go over the example problems provided in light of your particular facility.
- Attend one or more of the workshops in July. Note that the July 17 workshop is being designed specifically for AB2588 facilities.
- However, you may attend any of the other workshops. District and Ecotek staff will be prepared to answer any AB2588 questions you may have at any of the workshops.
- You are strongly encouraged to use the reporting software. It will make the process simpler and more efficient.
- Take advantage of the program support listed in General Instruction Book on page 9.
- In Appendices B, C, D and E, we provide default emission factors for internal and external fuel combustion, plating operations, spray booth coating operations, and asbestos abatement respectively. The provided emission factors are conservative and therefore may overestimate emissions. So if any of your facility's equipment has district-approved source test results, these should be used for emission calculation.

Worker and Residential Receptor Distances

Receptor locations are off-site locations where persons may be exposed to toxic emissions from equipment. Residential receptor locations include current residential land uses and areas that may be developed for residential uses in the future, given land use trends in the general area. Commercial receptor locations include areas zoned for manufacturing, light or heavy industry, retail activity, or locations that are regular work sites.

Worker Receptor Distance – Closest distance between any source of air toxic emissions at your facility and the property boundary of any one of the following receptors: other business or work-site, school, day-care center, shopping center, or hospital.

Residential Receptor Distance - Closest distance between any source of air toxic emissions at your facility and the property boundary of any one of the following receptors: house, apartment, convalescent home, trailer park, or other residence.

If you are an AB2588 facility that is filing a quadrennial toxic emission inventory, list your closest worker and residential receptor distance on Form X (if you are using paper forms), or in Interview (if you are using the software).

Appendix A - List of Toxic Substances, the Reporting Thresholds and Special Instructions for Reporting Select TACs

Table A-1 contains the list of compounds to be reported by AB2588 facilities preparing their quadrennial emissions inventory under the AER Program. The table provides the compound name, its TAC code and CAS number, and the degree of accuracy for each toxic. The table is alphabetically sorted by name. Multiple compounds within a TAC code group are listed in alphabetical order and shown in italics. The degree of accuracy is nothing more than a de minimis emission level for reporting. As a result, facility-wide emissions of toxics greater than one-half of their corresponding degree of accuracy must be inventoried and reported. Conversely, total facility toxic emissions less than one-half of the degree of accuracy do not need to be reported for TAC Codes 24 through 31 and 33 through 73.

Also shown in the table is whether the substance is a VOC, a component of particulate matter (PM), or a toxic air contaminant (TAC) and/or ozone depleting compound (ODC). This information should be used when estimating the VOC and PM emissions. As stated earlier, AB2588 facilities are required to report the corresponding criteria pollutant emissions on the applicable forms and pay corresponding emission fees if they exceed the thresholds.

Table A-1 lists the family name and the individual species within the family for the following toxic air contaminants (TACs):

- Chlorinated dioxins and dibenzofurans (TAC code #7)
- Fluorocarbons (chlorinated) (TAC code #22)
- Glycol ethers and their acetates (TAC code #41)
- Hexachlorocyclohexanes (TAC code #43)
- Isocyanates and diisocyanates (TAC code #48)
- Mercury and mercury compounds (TAC code #50)
- PAHs (TAC code #19)
- Phosphorous compounds (TAC code #60)
- POMS and PAH-derivatives (TAC code #61)
- Selenium and compounds (TAC code #64)
- Sulfuric acid and oleum (TAC code #67)
- Xylenes (TAC code #70)

It is important when reporting emissions for these families of compounds that emissions are not double-counted thus adversely affecting the facility's emissions and/or fees. Emissions reported for the overall family and each of the species within the family are summed for the purpose of calculating total facility emissions and/or assigning fees and prioritizing facility risks. Therefore, it is important that you either report emissions by individual species or overall emissions for the toxic family. You must report emissions by individual species whenever that information is known. Only report emissions as a group total if the individual species emissions are unknown. Table A-2 considers each toxic family and several other toxics such as, arsenic (CAS #7440382), asbestos (CAS #1332214), hexavalent chromium (CAS #18540299), lead (CAS #7439921), and nickel (CAS #7440020), and provides recommendations for emissions reporting. All TAC emissions must be reported on form TAC as well as on form TACS or TACSO depending on the type of TAC. It is important that the directions provided in Table A-2 be read carefully before calculating TAC emissions.

Table A-1. DeMinimis Reporting Limits for Toxics

TAC Code	CAS Number	Substance	Type of TAC/ODC	Degree of Accuracy (lbs/yr)
29	75070	Acetaldehyde	TAC and VOC	20
30	107028	Acrolein	TAC and VOC	0.05
31	107131	Acrylonitrile	TAC and VOC	0.1
32	7664417	Ammonia	TAC only	200
14	7440382	Arsenic and Compounds (inorganic)	TAC and PM	0.01
1	1332214	Asbestos	TAC and PM	0.0001
2	71432	Benzene	TAC and VOC	2
3	7440417	Beryllium	TAC and PM	0.001
4	106990	Butadiene [1,3]	TAC and VOC	0.1
5	7440439	Cadmium	TAC and PM	0.01
6	56235	Carbon tetrachloride	TAC and VOC	1
33	463581	Carbonyl sulfide	TAC only	100
34	7782505	Chlorine	TAC only	0.5
35	67663	Chloroform	TAC and VOC	10
13	18540299	Chromium, hexavalent (and compounds)	TAC and PM	0.0001
36	7440508	Copper	TAC and PM	0.1
37	7631869	Crystalline silica	TAC and PM	0.1
38	117817	Di(2-ethylhexyl) phthalate {DEHP}	TAC and VOC	20
7	1080	Chlorinated dioxins and dibenzofurans	TAC and VOC	0.000001
	67562394	*1,2,3,4,6,7,8-Heptachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	55673897	*1,2,3,4,7,8,9-Heptachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	35822469	*1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin [POM]*	TAC and VOC	0.000001
	70648269	*1,2,3,4,7,8-Hexachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	57117449	*1,2,3,6,7,8-Hexachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	72918219	*1,2,3,7,8,9-Hexachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	60851345	*2,3,4,6,7,8-Hexachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	39227286	*1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin [POM]*	TAC and VOC	0.000001
	57653857	*1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin [POM]*	TAC and VOC	0.000001
	19408743	*1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin [POM]*	TAC and VOC	0.000001
	39001020	*1,2,3,4,5,6,7,8-Octachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	3268879	*1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin [POM]*	TAC and VOC	0.000001
	57117416	*1,2,3,7,8-Pentachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	57117314	*2,3,4,7,8-Pentachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	40321764	*1,2,3,7,8-Pentachlorodibenzo-p-dioxin [POM]*	TAC and VOC	0.000001
	51207319	*2,3,7,8-Tetrachlorodibenzofuran [POM]*	TAC and VOC	0.000001
	1746016	*2,3,7,8-Tetrachlorodibenzo-p-dioxin {TCDD} [POM]*	TAC and VOC	0.000001
27	78875	1,2-Dichloropropane {Propylene dichloride}	TAC and VOC	20
28	542756	1,3-Dichloropropene	TAC and VOC	10
72	9901	Diesel exhaust particulates	TAC and PM	0.1
39	131113	Dimethyl phthalate	TAC and VOC	50
8	123911	1,4-Dioxane	TAC and VOC	5
40	100414	Ethyl benzene	TAC and VOC	200
9	106934	Ethylene dibromide {1,2-Dibromoethane}	TAC and VOC	0.5
10	107062	Ethylene dichloride {1,2-Dichloroethane}	TAC and VOC	2
11	75218	Ethylene oxide	TAC and VOC	0.5

(continued)

Table A-1. (continued)

TAC Code	CAS Number	Substance	Type of TAC/ODC	Degree of Accuracy (lbs/yr)
22	1104	Fluorocarbons (chlorinated)	TAC, ODC	1
	76131	*Trichlorotrifluoroethane {CFC-113}*	TAC, ODC	1
	75434	*Dichlorofluoromethane {Freon 12}*	TAC, ODC	1
	75694	*Trichlorofluoromethane {Freon 11}*	TAC, ODC	1
12	50000	Formaldehyde	TAC and VOC	5
41	1115	Glycol ethers and their acetates	TAC and VOC	100
	111466	*Diethylene glycol*	TAC and VOC	100
	111966	*Diethylene glycol dimethyl ether*	TAC and VOC	100
	112345	*Diethylene glycol monobutyl ether*	TAC and VOC	100
	111900	*Diethylene glycol monoethyl ether*	TAC and VOC	100
	111773	*Diethylene glycol monomethyl ether*	TAC and VOC	100
	25265718	*Dipropylene glycol*	TAC and VOC	100
	34590948	*Dipropylene glycol monomethyl ether*	TAC and VOC	100
	629141	*Ethylene glycol diethyl ether*	TAC and VOC	100
	110714	*Ethylene glycol dimethyl ether*	TAC and VOC	100
	111762	*Ethylene glycol monobutyl ether*	TAC and VOC	200
	110805	*Ethylene glycol monoethyl ether*	TAC and VOC	50
	111159	*Ethylene glycol monoethyl ether acetate*	TAC and VOC	100
	109864	*Ethylene glycol monomethyl ether*	TAC and VOC	10
	110496	*Ethylene glycol monomethyl ether acetate*	TAC and VOC	200
	2807309	*Ethylene glycol monopropyl ether*	TAC and VOC	100
	107982	*Propylene glycol monomethyl ether*	TAC and VOC	200
	108656	*Propylene glycol monomethyl ether acetate*	TAC and VOC	100
	112492	*Triethylene glycol dimethyl ether*	TAC and VOC	100
42	118741	Hexachlorobenzene	TAC and VOC	0.1
43	608731	Hexachlorocyclohexanes	TAC and VOC	0.05
	319846	*alpha-Hexachlorocyclohexane*	TAC and VOC	0.1
	319857	*beta-Hexachlorocyclohexane*	TAC and VOC	0.1
	58899	*Lindane {gamma-Hexachlorocyclohexane}*	TAC and VOC	0.1
44	110543	Hexane	TAC and VOC	200
45	302012	Hydrazine	TAC only	0.01
46	7647010	Hydrochloric acid	TAC and PM	20
73	7664393	Hydrogen fluoride (hydrofluoric acid)	TAC and PM	50
47	7783064	Hydrogen sulfide	TAC only	5
48	1125	Isocyanates and diisocyanates	TAC and VOC	0.05
	822060	*Hexamethylene-1,6-diisocyanate*	TAC and VOC	0.05
	624839	*Methyl isocyanate*	TAC and VOC	1
	101688	*Methylene diphenyl diisocyanate {MDI} [POM]*	TAC and VOC	0.1
	1204	*Toluene diisocyanates*	TAC and VOC	0.1
	584849	*Toluene-2,4-diisocyanate*	TAC and VOC	0.1
	91087	*Toluene-2,6-diisocyanate*	TAC and VOC	0.1
15	7439921	Lead compounds (inorganic)	TAC and PM	0.5
49	7439965	Manganese	TAC and PM	0.1

(continued)

Table A-1. (continued)

TAC Code	CAS Number	Substance	Type of TAC/ODC	Degree of Accuracy (lbs/yr)
		Mercury and mercury compounds	TAC and PM	
	7487947	*Mercuric chloride*	TAC and PM	1
50	7439976	*Mercury*	TAC and PM	1
	593748	*Methyl mercury {Dimethylmercury}*	TAC and PM	1
51	67561	Methanol	TAC and VOC	200
52	74873	Methyl chloride {Chloromethane}	TAC and VOC	20
23	71556	Methyl chloroform {1,1,1-Trichloroethane}	TAC, ODC	1
53	78933	Methyl ethyl ketone {2-Butanone}	TAC and VOC	200
54	108101	Methyl isobutyl ketone {Hexone}	TAC and VOC	20
55	1634044	Methyl tert-butyl ether	TAC and VOC	200
16	75092	Methylene chloride {Dichloromethane}	TAC only	50
17	7440020	Nickel	TAC and PM	0.1
57	106467	p-Dichlorobenzene {1,4-Dichlorobenzene}	TAC and VOC	5
	1151	PAHs, total, w/o individ. components reported [PAH, POM]	TAC and VOC	0.2
	83329	*Acenaphthene [PAH, POM]*	TAC and VOC	1
	208968	*Acenaphthylene [PAH, POM]*	TAC and VOC	1
	120127	*Anthracene [PAH, POM]*	TAC and VOC	1
	56553	*Benz[a]anthracene [PAH, POM]*	TAC and VOC	0.5
	50328	*Benzo[a]pyrene [PAH, POM]*	TAC and VOC	0.05
	205992	*Benzo[b]fluoranthene [PAH, POM]*	TAC and VOC	0.5
	192972	*Benzo[e]pyrene [PAH, POM]*	TAC and VOC	0.5
	191242	*Benzo[g,h,i]perylene [PAH, POM]*	TAC and VOC	0.5
	205823	*Benzo[j]fluoranthene [PAH, POM]*	TAC and VOC	0.5
	207089	*Benzo[k]fluoranthene [PAH, POM]*	TAC and VOC	0.5
	218019	*Chrysene [PAH, POM]*	TAC and VOC	1
19	53703	*Dibenz[a,h]anthracene [PAH, POM]*	TAC and VOC	0.1
	192654	*Dibenzo[a,e]pyrene [PAH, POM]*	TAC and VOC	0.05
	189640	*Dibenzo[a,h]pyrene [PAH, POM]*	TAC and VOC	0.001
	189559	*Dibenzo[a,i]pyrene [PAH, POM]*	TAC and VOC	0.001
	191300	*Dibenzo[a,l]pyrene [PAH, POM]*	TAC and VOC	0.001
	206440	*Fluoranthene [PAH, POM]*	TAC and VOC	0.5
	86737	*Fluorene [PAH, POM]*	TAC and VOC	0.5
	193395	*Indeno[1,2,3-cd]pyrene [PAH, POM]*	TAC and VOC	0.5
	91576	*2-Methyl naphthalene [PAH, POM]*	TAC and VOC	1
	91203	*Naphthalene [PAH, POM]*	TAC and VOC	0.1
	198550	*Perylene [PAH, POM]*	TAC and VOC	0.5
	85018	*Phenanthrene [PAH, POM]*	TAC and VOC	0.5
	129000	*Pyrene [PAH, POM]*	TAC and VOC	0.5
56	1336363	PCBs (Polychlorinated biphenyls) [POM]	TAC and VOC	0.01
58	87865	Pentachlorophenol	TAC and VOC	10
18	127184	Perchloroethylene {Tetrachloroethene}	TAC only	5
59	7723140	Phosphorus	TAC and PM	0.1

(continued)

Table A-1. (concluded)

TAC Code	CAS Number	Substance	Type of TAC/ODC	Degree of Accuracy (lbs/yr)
60		Phosphorous compounds	TAC and PM	
	7803512	*Phosphine*	TAC and PM	0.01
	7664382	*Phosphoric acid*	TAC and PM	50
	10025873	*Phosphorus oxychloride*	TAC and PM	0.1
	10026138	*Phosphorus pentachloride*	TAC and PM	0.1
	1314563	*Phosphorus pentoxide*	TAC and PM	0.1
	7719122	*Phosphorus trichloride*	TAC and PM	0.1
	126738	*Tributyl phosphate*	TAC and PM	100
	78400	*Triethyl phosphine*	TAC and PM	100
	512561	*Trimethyl phosphate*	TAC and PM	100
	78308	*Triorthocresyl phosphate [POM]*	TAC and PM	0.5
	115866	*Triphenyl phosphate [POM]*	TAC and PM	100
	101020	*Triphenyl phosphite [POM]*	TAC and PM	100
61		POMS and PAH-derivatives	TAC and VOC	
	226368	*Dibenz[a,h]acridine [POM]*	TAC and VOC	0.5
	224420	*Dibenz[a,j]acridine [POM]*	TAC and VOC	0.5
	194592	*7H-Dibenzo[c,g]carbazole*	TAC and VOC	0.05
	57976	*7,12-Dimethylbenz[a]anthracene [PAH-Derivative, POM]*	TAC and VOC	0.0001
	42397648	*1,6-Dinitropyrene [PAH-Derivative, POM]*	TAC and VOC	0.001
	42397659	*1,8-Dinitropyrene [PAH-Derivative, POM]*	TAC and VOC	0.05
	56495	*3-Methylcholanthrene [PAH-Derivative, POM]*	TAC and VOC	0.001
	3697243	*5-Methylchrysene [PAH-Derivative, POM]*	TAC and VOC	0.05
	101779	*4,4'-Methylenedianiline (and its dichloride) [POM]*	TAC and VOC	0.1
	602879	*5-Nitroacenaphthene [POM]*	TAC and VOC	2
	7496028	*6-Nitrochrysene [PAH-Derivative, POM]*	TAC and VOC	0.001
	607578	*2-Nitrofluorene [PAH-Derivative, POM]*	TAC and VOC	5
	5522430	*1-Nitropyrene [PAH-Derivative, POM]*	TAC and VOC	0.5
	57835924	*4-Nitropyrene [POM]*	TAC and VOC	1
62	75569	Propylene oxide	TAC and VOC	10
63	91225	Quinoline	TAC and VOC	100
64		Selenium and compounds	TAC and PM	
	7783075	*Hydrogen selenide*	TAC and PM	0.1
	7782492	*Selenium*	TAC and PM	0.5
	7446346	*Selenium sulfide*	TAC and PM	0.1
65	1310732	Sodium hydroxide	TAC and PM	2
66	100425	Styrene	TAC and VOC	100
24	79345	1,1,2,2-Tetrachloroethane	TAC and VOC	1
67		Sulfuric acid and oleum	TAC and PM	
	8014957	*Oleum*	TAC and PM	100
	7664939	*Sulfuric acid*	TAC and PM	2
	7446719	*Sulfur trioxide*	TAC and PM	100
68	108883	Toluene	TAC and VOC	200
25	79005	1,1,2-Trichloroethane {Vinyl trichloride}	TAC and VOC	1
20	79016	Trichloroethylene	TAC and VOC	20
26	95636	1,2,4-Trimethylbenzene	TAC and VOC	5
69	51796	Urethane {Ethyl carbamate}	TAC and VOC	0.1
21	75014	Vinyl chloride	TAC and VOC	0.5
70	1330207	Xylenes	TAC and VOC	200
	108383	*m-Xylene*	TAC and VOC	200
	95476	*o-Xylene*	TAC and VOC	200
	106423	*p-Xylene*	TAC and VOC	200
71	75456	Chlorodifluoromethane {Freon 22}	TAC and SPOG	200

Table A-2. Special Instructions for Reporting Select TACs

TAC code	Substance	Reporting recommendations
14	Arsenic and compounds	Be sure to consider the inorganic arsenic weight fraction in inorganic arsenic containing materials such as arsine when calculating the inorganic arsenic emissions. The arsenic weight fraction for arsine (CAS# 784421) is 0.9612.
1	Asbestos	Be sure to consider the asbestos weight fraction in mineral fibers such as erionite, talc, etc. when calculating the asbestos emissions.
13	Hexavalent chromium and compounds	Be sure to consider the hexavalent chromium weight fraction in coating materials such as barium chromate, calcium chromate, lead chromate, sodium chromate, strontium chromate, and chromium trioxide (as chromic acid mist) when calculating the hexavalent chromium emissions. The hexavalent chromium weight fractions for these compounds are as follows: barium chromate (CAS# 10294403) – 0.2053; calcium chromate (CAS# 13765190 – 0.3332; lead chromate (CAS# 7758976) – 0.1609; sodium dichromate (CAS# 10588019) – 0.397; strontium chromate (CAS# 7789062) – 0.2554; chromium trioxide (as chromic acid mist) (CAS# 1333820) – 0.52; zinc chromate (CAS # 13530659) – 0.2867.
7	Chlorinated dioxins and dibenzofurans	Report emissions by individual species whenever that information is available. Only report emissions as a group total if the individual species emissions are unknown. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
22	Fluorocarbons (chlorinated)	Report emissions by individual species whenever that information is available. Only report emissions as a group total if the individual species emissions are unknown. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
41	Glycol ethers and their acetates	Report emissions by individual species whenever that information is available. Only report emissions as a group total if the individual species emissions are unknown. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
43	Hexachlorocyclohexanes	Report emissions by individual species whenever that information is available. Only report emissions as a group total if the individual species emissions are unknown. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
48	Isocyanates and diisocyanates	Report emissions for each individual isocyanate or diisocyanate compound on form TAC. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.

(Continued)

Table A-2. (Concluded)

TAC code	Substance	Reporting recommendations
15	Lead compounds (inorganic)	Be sure to consider the lead weight fraction in lead containing materials such as lead oxide, lead acetate, lead phosphate, lead subacetate, and lead chromate, when calculating the lead emissions. The lead weight fractions for these materials are as follows: lead oxide (CAS# 1314-41-6) –0.9066; lead acetate (CAS# 301042) – 0.637; lead phosphate (CAS# 7446277) – 0.7659; lead subacetate (CAS# 1335326) – 0.7696; and lead chromate(CAS# 7758976) – 0.6411.
50	Mercury and mercury compounds	Report emissions for each individual mercury compound on form TAC. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
17	Nickel	Be sure to consider the nickel weight fraction in nickel containing materials such as nickel acetate, nickel carbonate, nickel carbonyl, nickel hydroxide, nickelocene, nickel oxide, nickel subsulfide and refinery dust when calculating the nickel emissions. The nickel weight fractions for these materials are as follows: nickel acetate (CAS# 373024) – 0.3321; nickel carbonate (CAS# 3333673) – 0.4945; nickel carbonyl (CAS# 13463393) – 0.3438; nickel hydroxide (CAS# 12054487) – 0.6332; nickelocene (CAS# 1271289) – 0.4937; nickel oxide (CAS# 1313991) – 0.7859; nickel subsulfide (CAS# 12035722) – 0.2443.
19	PAHs	Report emissions by individual species whenever that information is available. Only report emissions as a group total if the individual species emissions are unknown. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
60	Phosphorous compounds	Report emissions for each individual phosphorous compound on form TAC. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
61	POMs and PAH-derivatives	Report emissions by individual species whenever that information is available. Only report emissions as a group total if the individual species emissions are unknown. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
64	Selenium and compounds	Report emissions for each individual selenium compound on form TAC. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
67	Sulfuric acid and oleum	Report emissions for each individual sulfur compound on form TAC. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.
70	Xylenes	Report emissions by individual species whenever that information is available. Only report emissions as a group total if the individual species emissions are unknown. Do not double count the same emissions. Emissions from individual species with the same TAC code are added together on form TACS or TACSO to calculate the family total emissions.

Appendix B - Default Emission Factors for Fuel Combustion

Default Toxic Emission Factors for Form TAC Associated with Combustion Equipment Reported on Forms B1, B1U, B2, B2U, E1, E1U, and R2 are listed below and on the following pages. **If any of your combustion sources has district-approved source tests, use the emission factors developed from the source tests to calculate emissions.**

Table B-1: DEFAULT EF FOR NATURAL GAS COMBUSTION (LB / MMSCF)

SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)

TAC Code	POLLUTANT	CAS NO.	<10 MMBTU/HR	10-100 MMBTU/HR	>100 MMBTU/HR
2	Benzene	71432	0.0080	0.0058	0.0017
12	Formaldehyde	50000	0.0170	0.0123	0.0036
19	Total PAHs (excluding Naphthalene)	1151	0.0001	0.0001	0.0001
19	Naphthalene	91203	0.0003	0.0003	0.0003
29	Acetaldehyde	75070	0.0043	0.0031	0.0009
30	Acrolein	107028	0.0027	0.0027	0.0008
32	Ammonia*	7664417	18.000	18.000	18.000
40	Ethyl benzene	100414	0.0095	0.0069	0.0020
44	Hexane	110543	0.0063	0.0046	0.0013
68	Toluene	108883	0.0366	0.0265	0.0078
70	Xylene	1330207	0.0272	0.0197	0.0058

SOURCE: Flare, Non-Refinery

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.159
12	Formaldehyde	50000	1.169
19	Total PAHs (excluding Naphthalene)	1151	0.003
19	Naphthalene	91203	0.011
29	Acetaldehyde	75070	0.043
30	Acrolein	107028	0.010
40	Ethyl benzene	100414	1.444
44	Hexane	110543	0.029
68	Toluene	108883	0.058
70	Xylene	1330207	0.029

SOURCE: Turbine

TAC Code	POLLUTANT	CAS NO.	TURBINE
2	Benzene	71432	0.0122
4	1,3-Butadiene	106990	0.000439
12	Formaldehyde	50000	0.724
19	Naphthalene	91203	0.00133
19	PAHs (excluding Naphthalene)	1151	0.000918
29	Acetaldehyde	75070	0.0408
30	Acrolein	107028	0.00653
32	Ammonia*	7664417	18.000
40	Ethylbenzene	100414	0.0326
62	Propylene oxide	75569	0.0296
68	Toluene	108883	0.133
70	Xylene	1330207	0.0653

***This value corresponds to equipment with SNCR, for equipment with SCR substitute listed value by 9.1 lbs/mmscf, and for equipment without SNCR or SCR by 3.2 lbs/mmscf.**

(continued)

Table B-1: DEFAULT EF FOR NATURAL GAS COMBUSTION (LB / MMSCF) (continued)

SOURCE: Stationary and Portable Internal Combustion Engines (ICE)

TAC Code	POLLUTANT	CAS NO.	2 Stroke-Lean Burn	4 Stroke-Lean Burn	4 Stroke-Rich Burn
2	Benzene	71432	1.98	0.449	1.61
4	1,3-Butadiene	106990	0.836	0.272	0.676
6	Carbon Tetrachloride	56235	0.0619	0.0374	0.0181
9	Ethylene Dibromide	106934	0.0749	0.0452	0.0217
10	1,2-Dichloroethane	107062	0.0430	0.0241	0.0115
12	Formaldehyde	50000	56.3	53.9	20.9
16	Methylene Chloride	75092	0.150	0.0204	0.0420
19	2-Methylnaphthalene	91576	0.0218	0.0339	0
19	Acenaphthene	83329	0.00136	0.00128	0
19	Acenaphthylene	208968	0.00323	0.00564	0
19	Anthracene	120127	0.000732	0	0
19	Benz(a)anthracene	56553	0.000343	0	0
19	Benzo(a)pyrene	50328	0.00000579	0	0
19	Benzo(b)fluoranthene	205992	0.00000868	0.000169	0
19	Benzo(e)pyrene	192972	0.0000239	0.000423	0
19	Benzo(g,h,I)perylene	191242	0.0000253	0.000422	0
19	Benzo(k)fluoranthene	207089	0.00000435	0	0
19	Chrysene	218019	0.000685	0.000707	0
19	Fluoranthene	206440	0.000368	0.00113	0
19	Fluorene	86737	0.00172	0.00578	0
19	Indeno(1,2,3-c,d)pyrene	193395	0.0000101	0	0
19	Naphthalene	91203	0.09823	0.0759	0.0990
19	Perylene	198550	0.00000507	0	0
19	Phenanthrene	85018	0.00360	0.0106	0
19	Pyrene	129000	0.000596	0.00139	0
21	Vinyl Chloride	75014	0.0252	0.0152	0.00732
24	1,1,2,2-Tetrachloroethane	79345	0.0676	0.0408	0.0258
25	1,1,2-Trichloroethane	79005	0.0538	0.0324	0.0156
26	1,2,4-Trimethylbenzene	95636	0.113	0.0146	0
27	1,2-Dichloropropane	78875	0.0455	0.0274	0.0133
28	1,3-Dichloropropene	542756	0.0447	0.0269	0.0130
29	Acetaldehyde	75070	7.92	8.53	2.85
30	Acrolein	107028	7.94	5.24	2.68
32	Ammonia*	7664417	18.000	18.000	18.000
35	Chloroform	67663	0.0480	0.0291	0.0140
40	Ethylbenzene	100414	0.110	0.0405	0.0253
44	n-Hexane	110543	0.454	1.13	0
51	Methanol	67561	2.53	2.55	3.12
66	Styrene	100425	0.0559	0.0241	0.0121
68	Toluene	108883	0.982	0.416	0.569
70	Xylene	1330207	0.273	0.188	0.199

***This value corresponds to equipment with SNCR, for equipment with SCR substitute listed value by 9.1lbs/mmscf, and for equipment without SNCR or SCR by 3.2 lbs/mmscf.**

Table B-2: DEFAULT EF FOR DIESEL / DISTILLATE OIL FUEL COMBUSTION (LB / 1000 GAL)

SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.0044
4	1,3-Butadiene	106990	0.0148
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	0.3506
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Total PAHs (excluding Naphthalene)	1151	0.0445
19	Naphthalene	91203	0.0053
29	Acetaldehyde	75070	0.3506
30	Acrolein	107028	0.3506
32	Ammonia*	7664417	2.9000
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0002
44	Hexane	110543	0.0035
46	Hydrogen chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.0020
64	Selenium	7782492	0.0022
68	Toluene	108883	0.0044
70	Xylenes	1330207	0.0016

SOURCE: Stationary and Portable Internal Combustion Engines (ICE)

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.1863
4	1,3-Butadiene	106990	0.2174
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	1.7261
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Naphthalene	91203	0.0197
19	PAHs (excluding Naphthalene)	1151	0.0362
29	Acetaldehyde	75070	0.7833
30	Acrolein	107028	0.0339
32	Ammonia*	7664417	2.9000
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0109
44	Hexane	110543	0.0269
46	Hydrogen Chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.0020
64	Selenium	7782492	0.0022
68	Toluene	108883	0.1054
70	Xylenes	1330207	0.0424
72	Diesel exhaust particulates	9901	33.5000

SOURCE: Turbines

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.1863
4	1,3-Butadiene	106990	0.2174
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	1.7261
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Naphthalene	91203	0.0197
19	PAHs (excluding Naphthalene)	1151	0.0362
29	Acetaldehyde	75070	0.7833
30	Acrolein	107028	0.0339
32	Ammonia*	7664417	2.9000
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0109
44	Hexane	110543	0.0269
46	Hydrogen Chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.0020
64	Selenium	7782492	0.0022
68	Toluene	108883	0.1054
70	Xylenes	1330207	0.0424

***This value corresponds to equipment with SNCR, for equipment with SCR substitute listed value by 1.4 lbs/1000 gal, and for equipment without SNCR or SCR by 0.8 lbs/1000 gal.**

Table B-3: DEFAULT EF FOR LPG, BUTANE, OR PROPANE COMBUSTION (LB / 1000 GAL)

SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)

TAC Code	POLLUTANT	CAS NO.	<10 MMBTU/HR	10-100 MMBTU/HR	>100 MMBTU/HR
2	Benzene	71432	0.00071	0.00051	0.00015
12	Formaldehyde	50000	0.00151	0.00109	0.00032
19	PAHs (excluding Naphthalene)	1151	0.00001	0.00001	0.00001
19	Naphthalene	91203	0.00003	0.00003	0.00003
29	Acetaldehyde	75070	0.00038	0.00028	0.00008
30	Acrolein	107028	0.00024	0.00024	0.00007
32	Ammonia	7664417	0.30000	0.30000	0.30000
40	Ethyl benzene	100414	0.00084	0.00061	0.00018
44	Hexane	110543	0.00056	0.00041	0.00012
68	Toluene	108883	0.00325	0.00235	0.00069
70	Xylene	1330207	0.00241	0.00175	0.00051

SOURCE: Turbine

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.00109
4	1,3-Butadiene	106990	0.0000389
12	Formaldehyde	50000	0.0643
19	Naphthalene	91203	0.000118
19	PAHs (excluding Naphthalene)	1151	0.0000815
29	Acetaldehyde	75070	0.00362
30	Acrolein	107028	0.000579
32	Ammonia	7664417	0.30000
40	Ethylbenzene	100414	0.00290
62	Propylene oxide	75569	0.00262
68	Toluene	108883	0.0118
70	Xylene	1330207	0.00579

(Continued)

Table B-3: DEFAULT EF FOR LPG, BUTANE, OR PROPANE COMBUSTION (LB / 1000 GAL) (continued)

SOURCE: Stationary and Portable Internal Combustion Engines (ICE)

TAC Code	POLLUTANT	CAS NO.	2 Stroke-Lean Burn	4 Stroke-Lean Burn	4 Stroke-Rich Burn
2	Benzene	71432	0.17757	0.0398	0.143
4	1,3-Butadiene	106990	0.0742	0.0242	0.06
6	Carbon Tetrachloride	56235	0.00549	0.00332	0.0016
9	Ethylene Dibromide	106934	0.00664	0.00401	0.00193
10	1,2-Dichloroethane	107062	0.00382	0.00214	0.00102
12	Formaldehyde	50000	5.00	4.78	1.86
16	Methylene Chloride	75092	0.0133	0.00181	0.00373
19	2-Methylnaphthalene	91576	0.00194	0.003	0
19	Acenaphthene	83329	0.000120	0.000113	0
19	Acenaphthylene	208968	0.000287	0.0005	0
19	Anthracene	120127	0.0000650	0	0
19	Benz(a)anthracene	56553	0.0000304	0	0
19	Benzo(a)pyrene	50328	0.000000514	0	0
19	Benzo(b)fluoranthene	205992	0.000000770	0.000015	0
19	Benzo(e)pyrene	192972	0.00000212	0.0000376	0
19	Benzo(g,h,i)perylene	191242	0.00000224	0.0000375	0
19	Benzo(k)fluoranthene	207089	0.000000386	0	0
19	Chrysene	218019	0.0000608	0.0000627	0
19	Fluoranthene	206440	0.0000327	0.0001	0
19	Fluorene	86737	0.000153	0.000513	0
19	Indeno(1,2,3-c,d)pyrene	193395	0.000000899	0	0
19	Naphthalene	91203	0.00872	0.00673	0.00879
19	Perylene	198550	0.00000045	0	0
19	Phenanthrene	85018	0.000319	0.000941	0
19	Pyrene	129000	0.0000529	0.000123	0
21	Vinyl Chloride	75014	0.00224	0.00135	0.00065
24	1,1,2,2-Tetrachloroethane	79345	0.006	0.00362	0.00229
25	1,1,2-Trichloroethane	79005	0.00477	0.00288	0.00138
26	1,2,4-Trimethylbenzene	95636	0.01	0.00129	0
27	1,2-Dichloropropane	78875	0.00404	0.00243	0.00118
28	1,3-Dichloropropene	542756	0.00396	0.00239	0.00115
29	Acetaldehyde	75070	0.702	0.757	0.252
30	Acrolein	107028	0.704	0.465	0.238
32	Ammonia	7664417	0.30	0.30	0.30
35	Chloroform	67663	0.00426	0.00258	0.00124
40	Ethylbenzene	100414	0.00977	0.00359	0.00224
44	n-Hexane	110543	0.0403	0.10	0
51	Methanol	67561	0.224	0.226	0.277
66	Styrene	100425	0.00496	0.00214	0.00108
68	Toluene	108883	0.0872	0.0369	0.0505
70	Xylene	1330207	0.0243	0.0167	0.0176

Table B-4: DEFAULT EF FOR GASOLINE COMBUSTION (LB / 1000 GAL)

SOURCE: Stationary and Portable Internal Combustion Engines (ICE)

TAC Code	POLLUTANT	CAS NO.	Non-catalyst (Portable and Stationary)	Catalyst, Portable	Catalyst, Stationary
2	Benzene	71432	3.8061	1.5726	0.1564
4	1,3-Butadiene	106990	0.9183	0.3240	0.0322
12	Formaldehyde	50000	3.4520	1.0131	0.1007
17	Nickel	7440020	0.0033	0.0033	0.0033
19	Naphthalene	91203	0.1438	0.0295	0.0029
26	1,2,4-Trimethylbenzene	95636	1.3941	0.5890	0.0586
29	Acetaldehyde	75070	0.8298	0.1473	0.0146
30	Acrolein	107028	0.1992	0.0825	0.0082
34	Chlorine	7782505	0.4550	0.4550	0.4550
36	Copper	7440508	0.0033	0.0033	0.0033
40	Ethyl benzene	100414	1.6596	0.6420	0.0638
44	Hexane	110543	1.4494	0.9424	0.0937
49	Manganese	7439965	0.0033	0.0033	0.0033
51	Methanol	67561	0.7745	0.2415	0.0240
53	Methyl ethyl ketone - MEK	78933	0.0664	0.0118	0.0012
55	Methyl tert-butyl ether (MTBE)	1634044	2.0579	1.1544	0.1148
66	Styrene	100425	0.1438	0.0707	0.0070
68	Toluene	108883	7.5125	3.5046	0.3485
70	m-Xylene	108383	4.9235	2.1734	0.2161
70	o-Xylene	95476	1.7149	0.7539	0.0750

Table B-5: EF FOR JET FUEL COMBUSTION (LB / 1000 GAL)

SOURCE: Turbine

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.9377
4	1,3-Butadiene	106990	0.8563
5	Cadmium	7440439	0.0168
12	Formaldehyde	50000	7.2700
14	Arsenic	7440382	0.1776
15	Lead	7439921	0.1843
17	Nickel	7440020	0.0168
19	Naphthalene	91203	0.2740
29	Acetaldehyde	75070	2.2478
30	Acrolein	107028	1.0961
40	Ethylene benzene	100414	0.0813
64	Selenium	7782492	0.0168
66	Styrene	100425	0.1927
68	Toluene	108883	0.2526
70	Xylene	1330207	0.2312

Table B-6: DEFAULT EF FOR LANDFILL GAS COMBUSTION (LB / MMSCF)

SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
3	Beryllium	7440417	0.0011
5	Cadmium	7440439	0.0067
7	1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	0.00000145
7	1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	0.00000145
7	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00000145
7	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00000145
7	1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.000000727
7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653857	0.000000727
7	1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.000000727
7	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.000000727
7	2,3,7,8-Tetrachlorodibenzofuran	51207319	0.000000727
7	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.000000727
12	Formaldehyde	50000	0.134
13	Hexavalent chromium	18540299	0.000714
14	Arsenic	7440382	0.00394
15	Lead	7439921	0.00685
17	Nickel	7440020	0.115
19	Acenaphthene	83329	0.000419
19	Acenaphthylene	208968	0.000419
19	Anthracene	120127	0.000419
19	Benzo(a)anthracene	56553	0.000419
19	Benzo(a)pyrene	50328	0.000419
19	Benzo(b)fluoranthene	205992	0.000419
19	Benzo(g,h,I)perylene	191242	0.000419
19	Benzo(k)fluoranthene	207089	0.000419
19	Chrysene	218019	0.000419
19	Dibenz(a,h)anthracene	53703	0.000419
19	Fluoranthene	206440	0.000419
19	Fluorene	86737	0.000419
19	Indeno(1,2,3-cd)pyrene	193395	0.000419
19	Naphthalene	91203	0.259
19	Phenanthrene	85018	0.000419
19	Pyrene	129000	0.000419
32	Ammonia	7664417	2.3500
36	Copper	7440508	0.0111
49	Manganese	7439965	0.3790
50	Mercury	7439976	0.0000786
64	Selenium	7782492	0.000508

(continued)

Table B-6: DEFAULT EF FOR LANDFILL GAS COMBUSTION (LB / MMSCF)
(continued)

SOURCE: Flare, Non-Refinery

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.159
12	Formaldehyde	50000	1.169
19	Total PAHs (excluding Naphthalene)	1151	0.003
19	Naphthalene	91203	0.011
29	Acetaldehyde	75070	0.043
30	Acrolein	107028	0.010
40	Ethyl benzene	100414	1.444
44	Hexane	110543	0.029
68	Toluene	108883	0.058
70	Xylene	1330207	0.029

SOURCE: Stationary and Portable Internal Combustion Engines (ICE) and Turbines

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.00840
6	Carbon tetrachloride	56235	0.000720
16	Methylene chloride	75092	0.000920
18	Perchloroethylene	127184	0.00100
20	Trichloroethylene	79016	0.000760
21	Vinyl chloride	75014	0.000640
35	Chloroform	67663	0.000560
68	Toluene	108883	0.0440
70	Xylenes	1330207	0.0124

Table B-7: DEFAULT EF FOR DIGESTER GAS COMBUSTION (LB / MMSCF)

SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)

TAC Code	POLLUTANT	CAS NO.	<10 MMBTU/HR	10-100 MMBTU/HR	>100 MMBTU/HR
2	Benzene	71432	0.0080	0.0058	0.0017
12	Formaldehyde	50000	0.0170	0.0123	0.0036
19	Total PAHs (excluding Naphthalene)	1151	0.0001	0.0001	0.0001
19	Naphthalene	91203	0.0003	0.0003	0.0003
29	Acetaldehyde	75070	0.0043	0.0031	0.0009
30	Acrolein	107028	0.0027	0.0027	0.0008
32	Ammonia	7664417	3.2000	3.2000	3.2000
40	Ethyl benzene	100414	0.0095	0.0069	0.0020
44	Hexane	110543	0.0063	0.0046	0.0013
68	Toluene	108883	0.0366	0.0265	0.0078
70	Xylene	1330207	0.0272	0.0197	0.0058

SOURCE: Flare, Non-Refinery

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
2	Benzene	71432	0.159
12	Formaldehyde	50000	1.169
19	Total PAHs (excluding Naphthalene)	1151	0.003
19	Naphthalene	91203	0.011
29	Acetaldehyde	75070	0.043
30	Acrolein	107028	0.010
40	Ethyl benzene	100414	1.444
44	Hexane	110543	0.029
68	Toluene	108883	0.058
70	Xylene	1330207	0.029

SOURCE: Stationary and Portable Internal Combustion Engines (ICE) and Turbines

TAC Code	POLLUTANT	CAS NO.	ALL SIZES
4	1,3 Butadiene	106990	0.00588
5	Cadmium	7440439	0.000348
6	Carbon tetrachloride	56235	0.0120
10	Ethylene dichloride	107062	0.00900
12	Formaldehyde	50000	0.1140
14	Arsenic	7440382	0.00138
15	Lead	7439921	0.00204
16	Methylene chloride	75092	0.00780
17	Nickel	7440020	0.00120
18	Perchloroethylene	127184	0.0126
20	Trichloroethylene	79016	0.0108
21	Vinyl chloride	75014	0.0216
29	Acetaldehyde	75070	0.0318
32	Ammonia	7664417	3.2000
35	Chloroform	67663	0.0102
57	1,4 Dichlorobenzene	106467	0.0120
64	Selenium	7782492	0.00660

Appendix C - Default Emission Factors for Plating Operations

Table C-1 lists uncontrolled emission factors for hexavalent chromium (Cr+6), nickel (Ni), cadmium (Cd) and total particulate matter (PM). The factors are provided in pounds per 1000 ampere-hours. Table C-2 lists the certified wetting-agent chemical fume suppressant with usage restrictions to meet 0.01 milligram per ampere-hour limit (or 0.000022 lb/1000 ampere-hr). Table C-3 provides the control efficiencies for various add-on control devices. If your process is controlled with a combination of up to 3 control methods, you are allowed to apply the control efficiency (CE) additively **except for HEPA filter** as follows:

$$\text{Overall CE} = 1 - [(1\text{-}CE_1) \times (1\text{-}CE_2) \times (1\text{-}CE_3)]$$

The maximum control efficiency for any combination of control methods is 99.97%. If your process is controlled by more than 3 control methods, please contact the Help Hotline at (714) 596-7456 for assistance. The emission factors and control efficiencies given in Tables C-1, C-2, and C-3 are for reporting emissions under consolidated Annual Emission Reporting program **only**. For permit applications, please consult with permit processing engineers for specific instructions regarding control methods and control efficiencies.

It is expected that many facilities have greater levels of control; therefore, facilities are encouraged to use emission factors specific to their operations. Please provide supporting documentation for your emission factors. **If any of your plating processes has a district-approved source test, then use the emission factors developed from the source tests for calculating emissions.**

Table C-1. Emission Factors for Plating Operations

TAC/Process	Emission factor (lb/1000 ampere-hr)	
	Toxic Metal	Total PM[5]
Uncontrolled hexavalent chromium (Cr^{+6}) plating emission factor [1]	0.0097	0.020
Uncontrolled nickel (Ni) plating emission factor [2]	0.00051	0.0011
Uncontrolled cadmium (Cd) plating emission factor [3]	0.0057	0.012
Uncontrolled cadmium rotating barrel plating [4]	0.000020	0.000041

[1] Estimated from the equation,

$$EF = 0.505(w)(100\text{-}N)$$

where, EF = emission factor in mg/amp-hr,

w = weight fraction of hexavalent chromium in solution, and

N = plating efficiency in percent

The representative chrome plating bath contains a chromic acid of 32 to 34 oz/gal, which equates to a weight fraction of approximately 10.9%. The assumed plating efficiency is 20%. EF = 4.4 mg/amp-hr = 0.0097 lb/1000 amp-hr.

[2] SCAQMD and Metal Finishers Association of Southern California, 1998 (Source Test No. 98-109 through 111)

[3] AP-42 Table 12.20-4, July 1996.

[4] SCAQMD (Source Test No. 02-0192)

[5] Assumes that 48% of particulate matter consists of the toxic metal. The relationship is derived from Table 12.20-1 of AP-42 dated July 1996 for plating operations with add-on control equipment.

Table C-2. Certified Wetting-Agent Chemical Fume Suppressants, Companies, and Usage Restrictions for Hexavalent Chromium Electroplating and Chromic Acid Anodizing Operations

Product	Company	Usage Limitations	Emission factor (lb/1000 ampere-hr)	
			Hexavalent Chromium[1]	Total PM[2]
Fumetrol 140	Atotech USA	Shall be used at or below 40 dynes/cm	0.000022	0.000045
Fumetrol 140 + Dis-Mist NP	Atotech USA	Both products shall be used in combination at or below 45 dynes/cm. A foam blanket of not less than one inch shall be maintained while plating, with foam blanket coverage of not less than 95% of the tank surface area.	0.000022	0.000045
Benchbrite CR-1800	Benchmark Products	Shall be used at or below 40 dynes/cm	0.000022	0.000045
Zero Mist Liquid R	Enthone, Cookson Electronics	Shall be used at or below 32 dynes/cm	0.000022	0.000045
Clepo Chrome Mist Control 74095	MacDermid	Shall be used at or below 40 dynes/cm	0.000022	0.000045

[1] Assumes 99.77% control efficiency.
[2] Assumes that 48% of particulate matter consists of the toxic metal. The relationship is derived from Table 12.20-1 of AP-42 dated July 1996 for plating operations with add-on control equipment.

Table C-3. Approved Control Efficiencies for Plating Operations

Control Method	Control Efficiency (%)
Mist eliminator	50%
Packed Bed Scrubber	70%
Mesh pad	95%
Chemical Fume Suppressants	95-99%
HEPA Filter and Certified Fume Suppressants or others[1]	99.97%

[1] Use 99.97% for any combination of HEPA filter and other control methods.

Report the PM emissions on Form B4 or B4U: Choose appropriate Activity Code for your plating operations, list the ampere-hr used during the reporting period in 1000 ampere-hr under throughput (divide ampere-hr by 1000), then calculate your controlled PM emission factor (EF). If specific data is not available for controlled PM emission factor, then use the "Total PM" emission factors in Tables C-1 and C-2 and the control efficiencies given in Table C-3 for any additional control you might have. As stated earlier, the overall control efficiency cannot exceed the HEPA control efficiency of 99.97%. For example, if you are reporting PM controlled emissions for hex. chromium plating using Fumetrol 140 fume suppressant, your controlled default PM emission factor for B4 or B4U would be 0.000045 lb/1000 amp-hr.

Then report your toxic metal (Hex. Chromium or Nickel or Cadmium) emissions on Form TAC by using B4 or B4U emission reference for plating operations, the same throughput used on form B4 or B4U (ampere-hr used during the reporting period in 1000 ampere-hr), the uncontrolled toxic metal emission factor and the Overall Control Efficiency in decimal format, or the controlled default toxic metal emission factor. For example, if you are reporting toxic metal emissions for hex. chromium plating with Fumetrol 140 fume suppressant for Form TAC, the controlled default emission factor for toxic metal would be 0.000022 lb/1000 amp-hr. If you have add-on control devices, use control efficiency in Table C-3, calculate the overall control efficiency from the above equation and list it under "Overall Control Efficiency" column.

Appendix D – Emission Factors for Spray Coating Operations

Overall control efficiency = 1 – [(1 – TE) x (1 – FCE)]

where: TE = transfer efficiency
FCE = filter control efficiency

Transfer efficiency = 0.65

Filter control efficiency
Conventional Filters: 0.90
Three-stage Aerospace NESHAP-compliant filters: 0.95
HEPA Filter: 0.9997 (The HEPA filters used shall be individually dioctyl phthalate [DOP] tested with 0.3 micron particles and certified to have an efficiency of not less than 0.9997.)

Supporting documentation from the manufacturer of filters used has to be submitted with the emission report. **If a multi-stage filtration system is used, the overall control efficiency for the filtration system shall be the highest control efficiency for the smallest particle size (efficiency of the last stage). Typically, a fall-out factor is not allowed unless it is evaluated by the District staff and conditions are included in permits.**

Hexavalent chromium weight fractions for various compounds:
Barium chromate ($BaCrO_4$; CAS # 10294403) – 0.2053
Calcium chromate ($CaCrO_4$; CAS # 13765190) – 0.3332
Lead chromate ($PbCrO_4$; CAS # 7758946) – 0.1609
Sodium chromate (Na_2CrO_4; CAS # 7775113) – 0.3210
Sodium dichromate ($Na_2Cr_2O_7$; CAS # 10588019) – 0.3970
Strontium chromate ($SrCrO_4$; CAS # 7789062) – 0.2554
Zinc chromate (ZnCrO4; CAS # 13530659) – 0.2867
If you need assistance with other compounds, please refer to Table A-2 of Appendix A or contact the District staff.

Example: A facility used 3 gal/yr of primer containing 30% strontium chromate ($SrCrO_4$) in a spray booth with conventional filters.
The density of the primer is 6 lb/gal.
The hexavalent chromium weight fraction in strontium chromate is 0.2554.

Overall control efficiency = 1– [(1 – TE) x (1 – FCE)]
= 1 – [(1 – 0.65) x (1 – 0.90)]
= 0.965
Hexavalent chromium content per gallon of primer = 6 lb/gal x 0.30 x 0.2554 = 0.4597 lb/gal
Emissions of hexavalent chromium = 3 gal/yr x 0.4597 lb/gal x (1 – 0.965)
= 0.04827 lb/yr

For particulate matter (PM) emissions, use procedures described in the "Guidelines for Particulate Matter Emission Calculations for Spray Coating Operations".

Appendix E – Emission Factors for Asbestos Abatement (Demolition)

PM and asbestos emissions from asbestos abatement operations:

If site specific data is not available, you can use the following default emission factors for PM and asbestos emission calculations resulting from a demolition/renovation (asbestos abatement) operation:

First report the PM emissions on Form B4: Choose the Activity Code "44- Asbestos abatement", list the amount of the building material removed in tons under the throughput, and use the following controlled default emission factor (HEPA filter efficiency is already built into the listed emission factor):

PM: emission factor = 0.006 lb/ton of building material removed

Next, report the Asbestos emissions on Form TAC by using B4 emission reference for asbestos abatement, the same throughput used on form B4 (tons of building material removed) and the following controlled default emission factor (HEPA filter efficiency is already built in the listed emission factor). Since the control is accounted for in the emission factor, list "0.00" under the Overall Control Efficiency:

Asbestos: emission factor = 0.0015 lb/ton of building material removed

Assumptions used in determining default emission factors:

- All operations controlled by HEPA filter with 99.97% efficiency
- PM airborne factor = 1% (AQMD)
- Average asbestos debris concentration = 25% (EPA)

Appendix F - Example

In this example, the emission reporting process using the software is illustrated for a hypothetical Company "B" that must update its toxics emission inventory under the AB2588 Program. Company "B" manufactures metal products and operates the following equipment:

- Two natural gas-fired boilers (7.5 million BTU/hr each)
- One permitted spray booth where products are coated with enamels and primers
- One hard-chrome plating process
- One permitted solvent degreaser using perchloroethylene (perc)

The following procedure can be used to facilitate the emissions calculation and reporting:

1. Report each equipment / process type on the appropriate forms (each emissions record **will automatically be transferred to form ES** by the software as illustrated in Example D):
    - Natural gas combustion in 2 boilers - Form B1 (Example A)
    - Coatings in spray booth - Form B3 for reporting the use of coating materials (Example B)
    - Form B4 for reporting PM emissions from coating and plating operations (Example C)
    - Perc degreaser - Form TAC (Example E)
    - Perc recycling credit - Form WT (Example F)
2. Report other TAC/ODC emissions using Form TAC (Example E)
3. Toxic emissions from form TAC will automatically be transferred to Forms TACS (Example G) or TACSO (Example H), and emission fees calculated on form TACS (Example G)
4. Emissions from Forms B1, B3, and B4 will automatically be transferred to Form C (Example I)
5. Emissions from Form C will automatically be transferred to Form S and applicable fees calculated (Example J)
6. Submit any facility updates, or refund or amendment requests to the SCAQMD using Form A (Example K)
7. Submit form S, singed form X (Example L) and if applicable forms A and CF to the SCAQMD along with any fees due.

Detailed Instructions on how to complete individual forms for this example are provided in the following pages.

Please note that if you don't use the software to report, you must manually record each emission source to Form ES and each toxic air contaminant to Forms TAC, TACS, and TACSO.

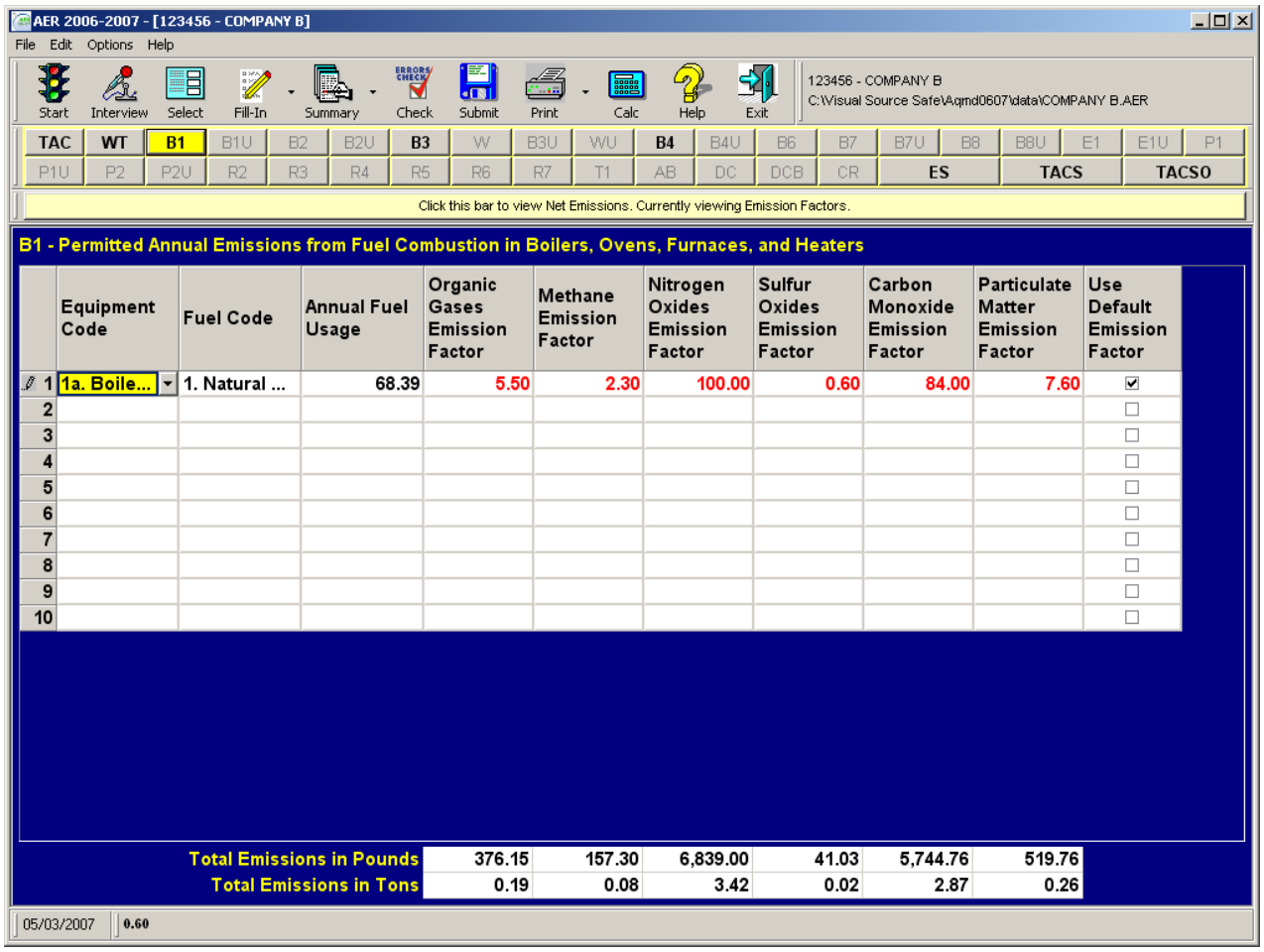
A simplified example illustrating step by step instructions (including illustrations for program navigation) for using the reporting software ("Brief Demo Presentation - How to use AER Software for AB2588 reporting facilities?") is available for download at the following web link: http://www.ecotek.com/aqmd/web_pp_presentation/0607_ab/frame.htm

Example (A): Form B1 - Permitted Annual Emissions from Fuel Combustion in Boilers, Ovens, Furnaces, and Heaters

During fiscal year 2006-2007, Company "B" burned a total of 718,382 therms of natural gas (from the Gas bills) in both boilers. STEPS TO FOLLOW:

1. **Equipment and Fuel Code:**
   On the first row, enter equipment code "1a. Boiler <10MMBTU/HR" for boilers (two identical boilers using the same fuel can be recorded as one entry) and fuel code "1" for natural gas.
2. **Annual Fuel Usage:**
   Convert total natural gas usage from therms to million standard cubic feet (mmscf) by using the software conversion tool ("Calc" in the menu bar) and enter the amount in mmscf.
3. **Emission Factors and Emissions:**
   To use the default emission factors, click on the checkbox in the last column. Operators should use equipment specific emission factors if available. In this example, default emission factors are used.
4. **Total Emissions:**
   Total emissions in pounds and tons are automatically calculated by the software and displayed in the bottom of the screen. Emissions in tons are automatically transferred to form C, line 1 (Example I).

   The emission source (natural gas–boilers <10MMBTU/HR) from this form is automatically transferred to Form ES (Example D).



Example (B): Form B3 - Permitted Annual Emissions from the Use of Organics

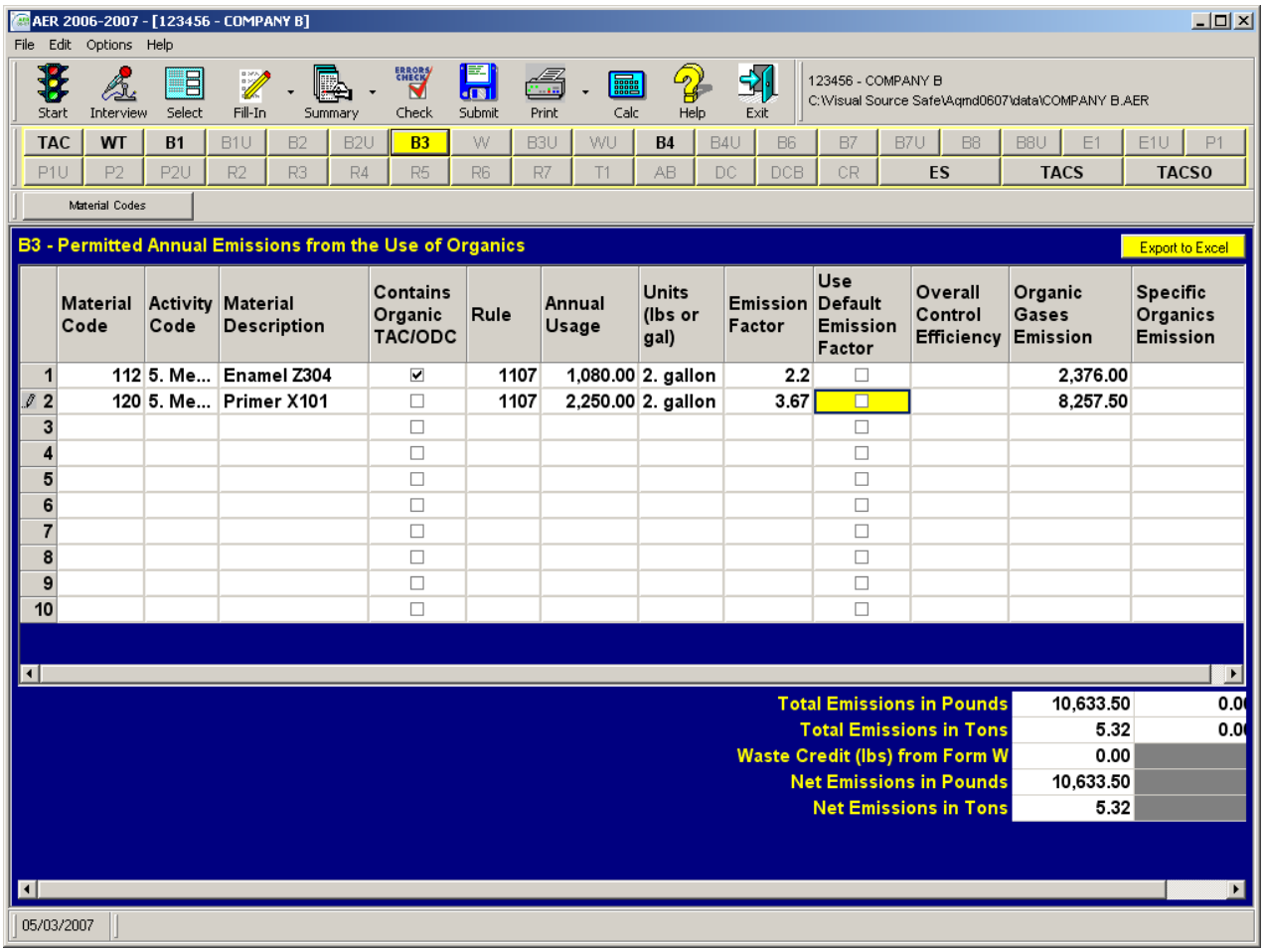
During fiscal year 2006-2007, Company "B" sprayed 1,080 gallons of enamel and 2,250 gallons of primer **inside** the spray booth. Material Safety Data Sheets (MSDS) indicate that the primer (VOC content = 3.67 lbs/gal, material density = 8.6 lbs/gal, and solid content = 45%) contains 2.7% by weight hexavalent chromium (Cr^{+6}) and the enamel (VOC content = 2.20 lbs/gal, material specific gravity = 0.895, and solid content = 33%) contains 25% by weight 1,1,1-TCA. STEPS TO FOLLOW:

1. **Material Code, Activity Code, Material Description, Contains Organic TAC/ODC, and Rule:**
   In "Material Code" column, enter codes "112" for enamel and "120" for primer. For Activity Codes, enter "5" (metal coating) for both enamel and primer. Describe the materials by trade, commercial, or chemical names of the materials in the "Material Description" column.
   Checkmark the "Contains Organic TAC/ODC" box to indicate the presence of the 1,1,1-TCA as toxic organic in enamel. The primer contains PM (particulate) toxic (i.e., hexavalent chromium) not organic toxic, therefore, leave the "Contains Organic TAC/ODC" column unchecked on line 2.
   Note: The presence of any organic TAC/ODC (1,1,1-TCA in this case) in the enamel must be **identified** on this Form B3; the TAC/ODC emissions associated with 1,1,1-TCA must be **reported** on Form TAC. The PM emissions associated with the primer spray coating operation must be reported on Form B4, whereas, the toxic portion of the PM emissions must be reported on Form TAC.
   Enter "1107" as the applicable rule for this example.

2. **Annual Usage and Unit:**
   Enter applicable material usages and unit codes "2" for gallons.

3. **Emission Factors and Emissions:**
   Enter appropriate VOC emission factors [in this case 2.20 for enamel and 3.67 for primer]. If no material specific emission factor is available, click on "Use Default Emission Factor" to populate the "Emission Factor" column.
   "Organic Gases Emissions" are automatically calculated by the software. **"Specific Organics Emission" column is reserved for materials that are identified as specific organics in the "Material Code" column** (see Appendix B of the General Instructions Book).

4. **Total Emissions:**
   Total emissions in pounds and tons are automatically calculated by the software and displayed in the bottom of the screen. Emissions in tons are automatically transferred to form C, line 3 (Example I). Because Company "B" does not have any organic waste that could be recycled, "Waste credit (lbs) from form W" cell is populated with 0.00. **The emission sources (112-enamel, 120-primer) from this form are automatically transferred to Form ES** (Example D).

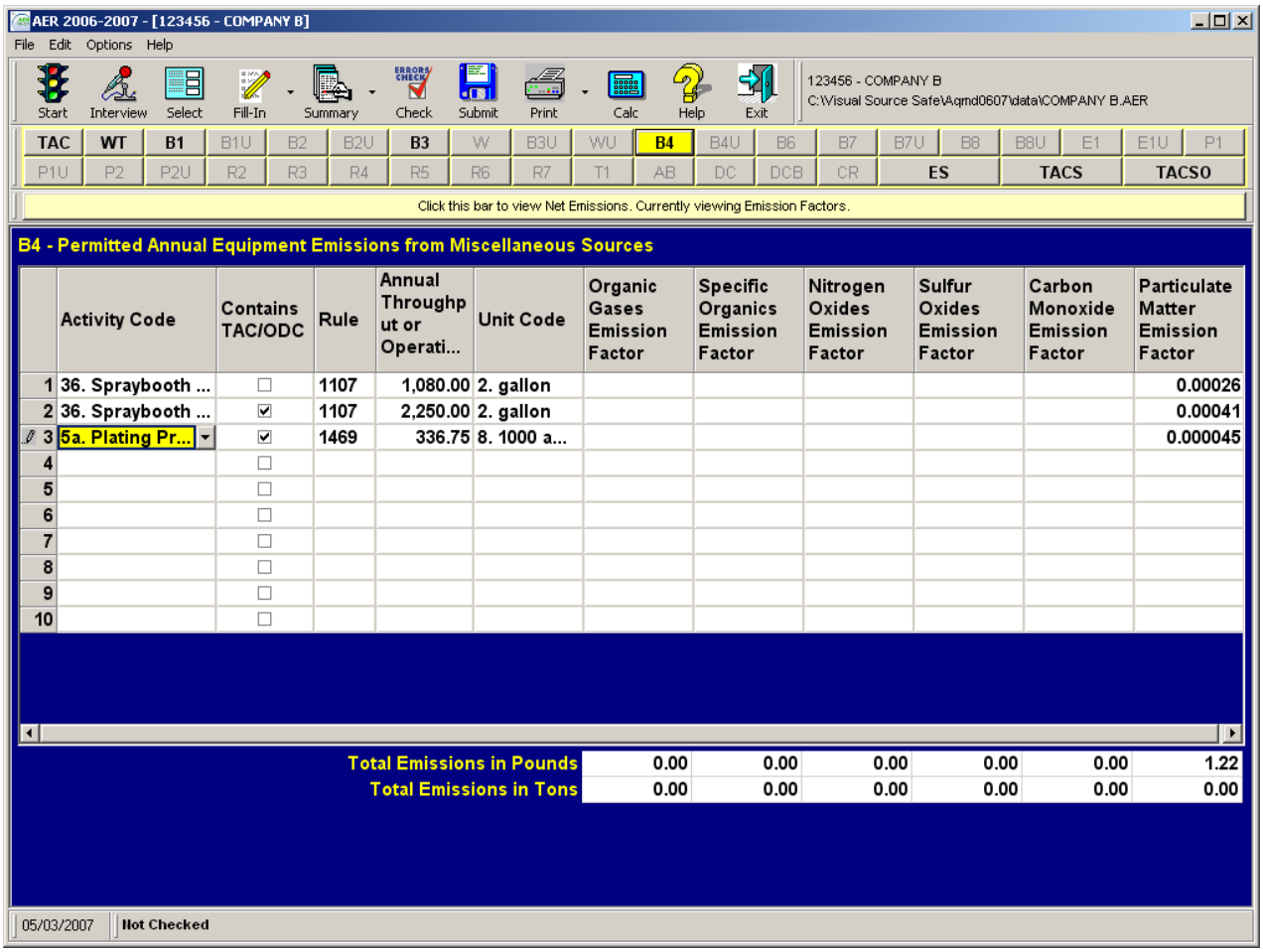


	Material Code	Activity Code	Material Description	Contains Organic TAC/ODC	Rule	Annual Usage	Units (lbs or gal)	Emission Factor	Use Default Emission Factor	Overall Control Efficiency	Organic Gases Emission	Specific Organics Emission
1	112	5. Me...	Enamel Z304	☑	1107	1,080.00	2. gallon	2.2	☐		2,376.00	
2	120	5. Me...	Primer X101	☐	1107	2,250.00	2. gallon	3.67	☐		8,257.50	
3				☐					☐			
4				☐					☐			
5				☐					☐			
6				☐					☐			
7				☐					☐			
8				☐					☐			
9				☐					☐			
10				☐					☐			

Example (C): Form B4 - Permitted Annual Emissions from Miscellaneous Sources

PM emissions from coating and plating operations are reported on this form. The spray gun is capable of transferring 65% of its solids in the sprayed materials. The filters in the spray booth are HEPA types, which are capable of controlling 99.97% of PM emissions. Particulate (PM) and hexavalent chromium emissions from the plating process are controlled by addition of suppressants in the bath solution. STEPS TO FOLLOW:

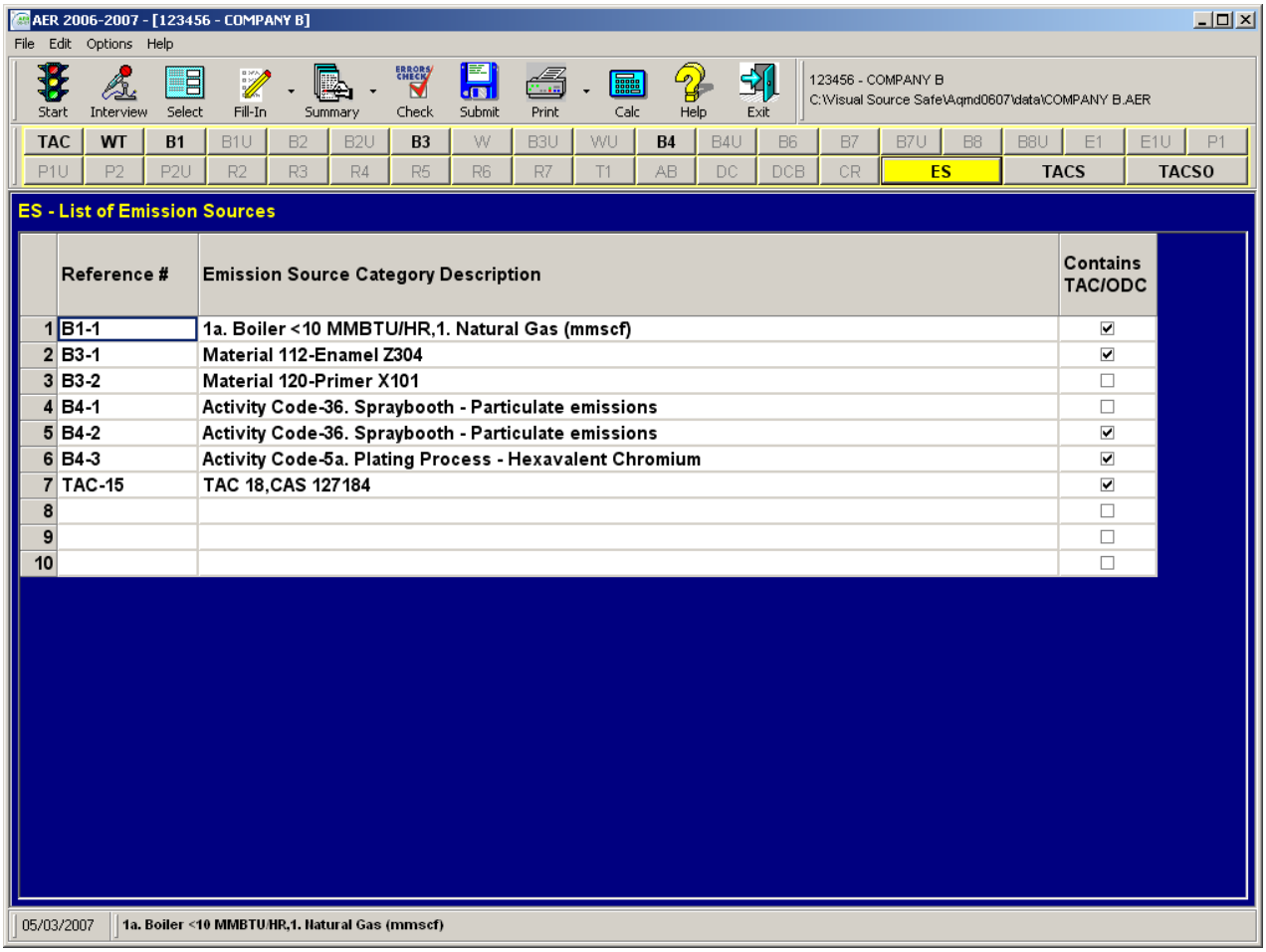
1. **Activity Code and TAC/ODC Presence:** Enter activity code "36" for PM emissions from spray booth for both enamel and primer; enter code "5a" for chrome plating operation. Leave the "Contains TAC/ODC" checkbox blank in the first row for enamel since the 111-TCA contained in the enamel is already identified on Form B3 (Example B). Mark the checkbox for both primer and plating because of the presence of chromium (Cr^{+6}) in the materials.
2. **Annual Throughput or Operating Hours, Unit Code, and Rule:**
   Enter Rule Number "1107" for coating operations and Rule 1469 for chrome plating operations in metal products manufacturing facilities.
   Enter the appropriate throughputs and unit codes (see appendix F of the general Instruction Book) as follows: for ENAMEL 1,080 gallons (unit code 2), for PRIMER 2,250 gallons (unit code 2) and for PLATING 336.75 1,000 Amp-Hr (unit code 8).
3. **Emission Factors and Emissions:** Enter appropriate emission factors. Operators should use specific emission factors if available; otherwise, use default factors provided in the instructions. The PM emission factors are calculated as follows:
   ENAMEL Z304:
   Emission factor (e.f.) = material density x solid content x (1 – spray gun transfer efficiency) x (1 – filter control efficiency)
   Where: material density = 8.34 lbs/gal x material specific gravity
   e.f. = 8.34 lbs/gal x 0.895 x 0.33 x (1 - 0.65) x (1 - 0.9997) = 0.00026 lbs/gal
   PRIMER X101:
   Emission factor (e.f.) = material density x solid content x (1 – spray gun transfer efficiency) x (1 – filter control efficiency)
   e.f. = 8.6 lbs/gal x 0.45 x (1 - 0.65) x (1 - 0.9997) = 0.00041 lbs/gal
   CHROME PLATING with certified Fumetrol 140:
   e.f.= 0.000045 lbs/1000 Amp-Hr (default factor provided in Table C-2 of Appendix C)
4. **Total Emissions:**
   Total emissions in pounds and tons are automatically calculated by the software and displayed in the bottom of the screen. Emissions in tons are automatically transferred to form C, line 4 (Example I). **Emission sources (36-PM in enamel, 36-PM in primer, and 5a - Plating Process - Hexavalent Chromium) from this form are automatically transferred to Form ES** (Example D).



	Activity Code	Contains TAC/ODC	Rule	Annual Throughput or Operati...	Unit Code	Organic Gases Emission Factor	Specific Organics Emission Factor	Nitrogen Oxides Emission Factor	Sulfur Oxides Emission Factor	Carbon Monoxide Emission Factor	Particulate Matter Emission Factor
1	36. Spraybooth ...	☐	1107	1,080.00	2. gallon						0.00026
2	36. Spraybooth ...	☑	1107	2,250.00	2. gallon						0.00041
3	5a. Plating Pr...	☑	1469	336.75	8. 1000 a...						0.000045
4		☐									
5		☐									
6		☐									
7		☐									
8		☐									
9		☐									
10		☐									
	Total Emissions in Pounds					0.00	0.00	0.00	0.00	0.00	1.22
	Total Emissions in Tons					0.00	0.00	0.00	0.00	0.00	0.00

Example (D): Form ES – List of Reference Emission Sources

This form is designed for listing all the emission sources reported on all the criteria emissions reporting forms, as well as organic solvents that are exclusively reported on Form TAC. Each row of emission data reported on each form represents an Emission Source. **Form ES is automatically created by the software based on the information previously reported on criteria and TAC forms.**



Example (E): Form TAC - Toxic Air Contaminants/Ozone Depleters Emission by Reference Number
TAC/ODC emissions associated with reference numbers identified on Form ES (Example D) are calculated on Form TAC. During fiscal year 2006-2007, Company "B" also operated a solvent degreaser and used 425 gallons (make-up solvent) of Perchloroethylene (Perc). If default toxic emission factors are available (see Appendix B, Default Emission Factors for Fuel Combustion), Form TAC is automatically populated with toxics associated with **combustion processes only. For other processes or combustion processes without default emission factors, toxic emissions** have to be entered manually to Form TAC.

STEPS TO FOLLOW:

1. **Combustion Toxics:**
   Form TAC is automatically populated with toxics associated with <10MMBTU/HR boiler burning natural gas reported on the first row of Form B1 (Reference B1-1). Ammonia default emission factor corresponds to equipment with Selective Non-Catalytic Reduction (SNCR). Since this company's boilers are not equipped with SNCR or SCR (Selective Catalytic Reduction), substitute the default value with the value for equipment without SNCR or SCR. For equipment or fuel types not listed in Appendix B, manually complete form TAC with equipment/fuel specific emission factors.

2. **Reference Form Row:**
   For other toxics, enter reference numbers for all emission sources that contain TAC/ODC as identified on form ES, by selecting them from the pull down menu. One row is assigned to 1,1,1-TCA associated with reference number B3-1, two rows for Cr+6 with reference numbers B4-2 and B4-3, and one for the perc solvent with reference number TAC-15.

3. **TAC Code and CAS Number:**
   Enter the TAC Code and CAS number (if not automatically populated after the TAC code was selected) for toxic contaminants by selecting them from the pull down menu. TAC Code and CAS number for the list of 177 toxic air contaminants covered in the AB2588 program are listed in the Appendix A of this supplemental instruction.

4. **Annual Usage, Unit Code, and Emission Factor:**
   Annual Usages and Unit Codes are automatically transferred by the software based on the information provided on the criteria form identified by the Reference Form Row.
   Enter emission factors for each TAC/ODC. Emission factors are determined as follows:

TAC Code	CONTAMINANT	Emission Factor	Unit	Source
Reference Number B3-1				
23	1,1,1-TCA	1.87	lbs/gal	Calculated
	Emission factor (e.f.) is calculated as follows:			
	e.f. = 8.34 lbs/gal x material specific gravity x weight fraction of solvent			
	e.f. = 8.34 lbs/gal x 0.895 x 0.25 = 1.87 lbs/gal			
Reference Number B4-2				
13	Hex Chromium	0.23	lbs/gal	Calculated
	Emission factor (e.f.) is calculated as follows:			
	e.f. = material density x weight fraction of chrome in material			
	e.f. = 8.6 lbs/gal x 0.027 = 0.23 lbs/gal			
Reference # B4-3				
13	Hex Chromium	0.000022	lbs/ 1000 Amp-Hr	Default (Table C-2 of Appendix C)
Reference Number TAC-15				
18	Perchloroethylene	13.53	lbs/gal	perc density

5. **Control Efficiency, Annual Gross Emissions, and Waste Credit:**
Hexavalent Chromium (Cr+6) is a toxic particulate in coating material (primer - Reference Number B4-2) which is captured and controlled by spray gun's transfer efficiency (65%) and spray booth's HEPA filter efficiency (99.97%). In this example, the overall control efficiency for Cr+6 is:

$$1 - [(1 - 0.65) \times (1 - 0.9997)] = 0.999895$$

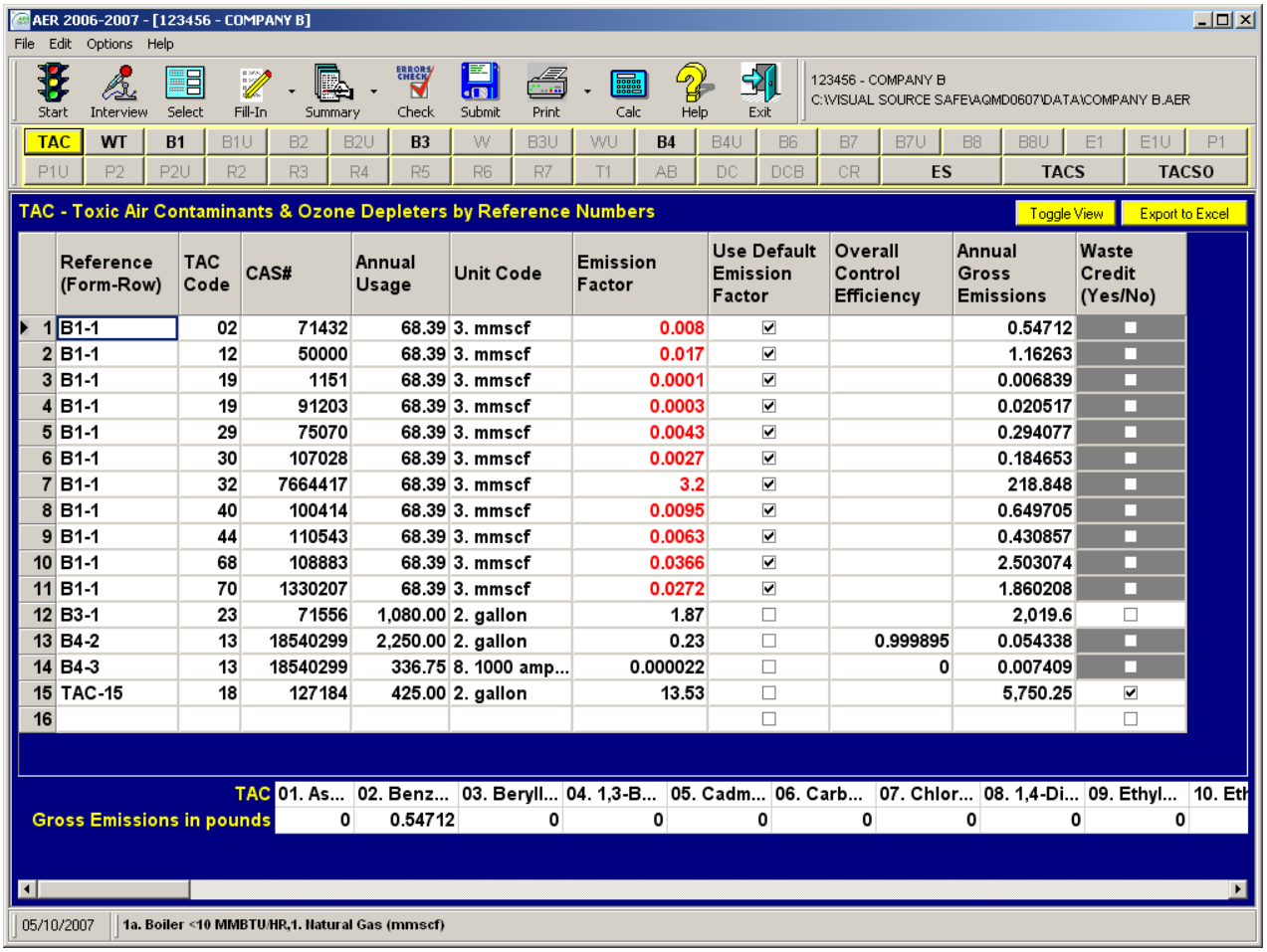
Hexavalent Chromium (Cr^{+6}) is also a toxic particulate resulting from the Hex Chrome plating operation (Reference Number B4-3) which is controlled by Fumetrol 140 suppressant – controlled default emission factor has been used, in other words, control has already been accounted for, consequently enter 0 in "Control Efficiency" column.

Record the overall control efficiency in decimal fraction (0.999895 for B4-2 and 0 for B4-3).

Annual gross emissions for each toxic contaminant are automatically calculated by the software.

Records indicated that waste Perc is recycled for credit; mark the corresponding checkbox to claim the credit. Please see Example F for calculation of Perc waste credit using Form WT.

The toxic emissions recorded on form TAC will be automatically transferred and summarized on Form TACS (Example G) and TACSO (Example H). See the completed Form TAC on the following page.



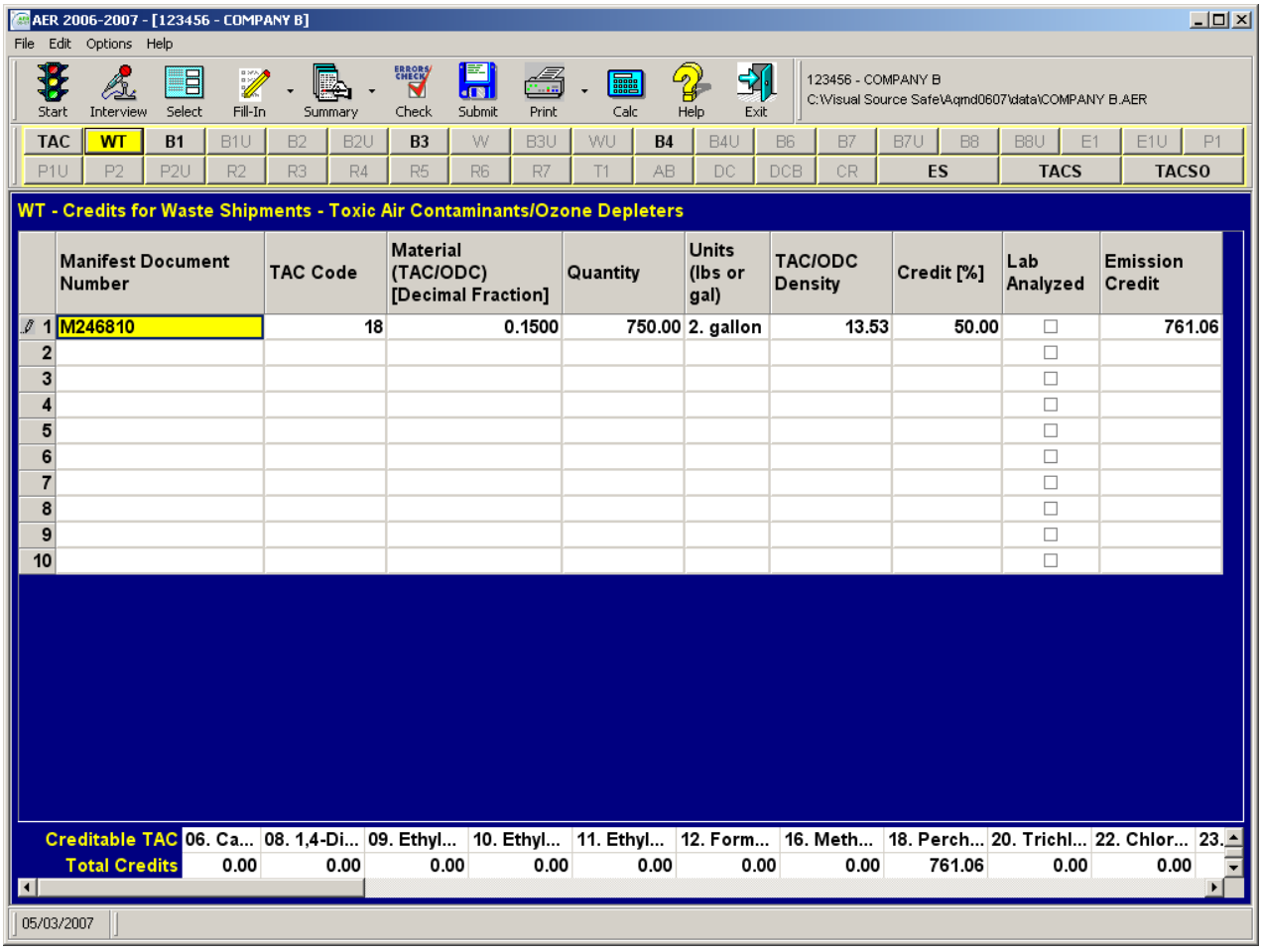
Example (F): Form WT - Credits for Waste Shipments for TAC/ODC:

During fiscal year 2006-2007, Company "B" also shipped 750 gallons of waste from the degreaser for recycle. The manifest indicated that perc content in the waste is approximately 15% by volume. Since this is single waste from the degreaser, density of perc (13.53 lbs/gal) is used as emission factor. Since the waste is not analyzed for the solvent content, therefore only 50% credit is allowed (the software automatically populates the cell with the value of 50.00, if lab analysis were available 100% credit could be claimed simply by checking the "Lab analyzed" checkbox.) Perc (TAC Code "18") Emission Credit is automatically calculated by the software based on the following formula:

Perc fraction in waste x waste amount x Perc density x 50% credit

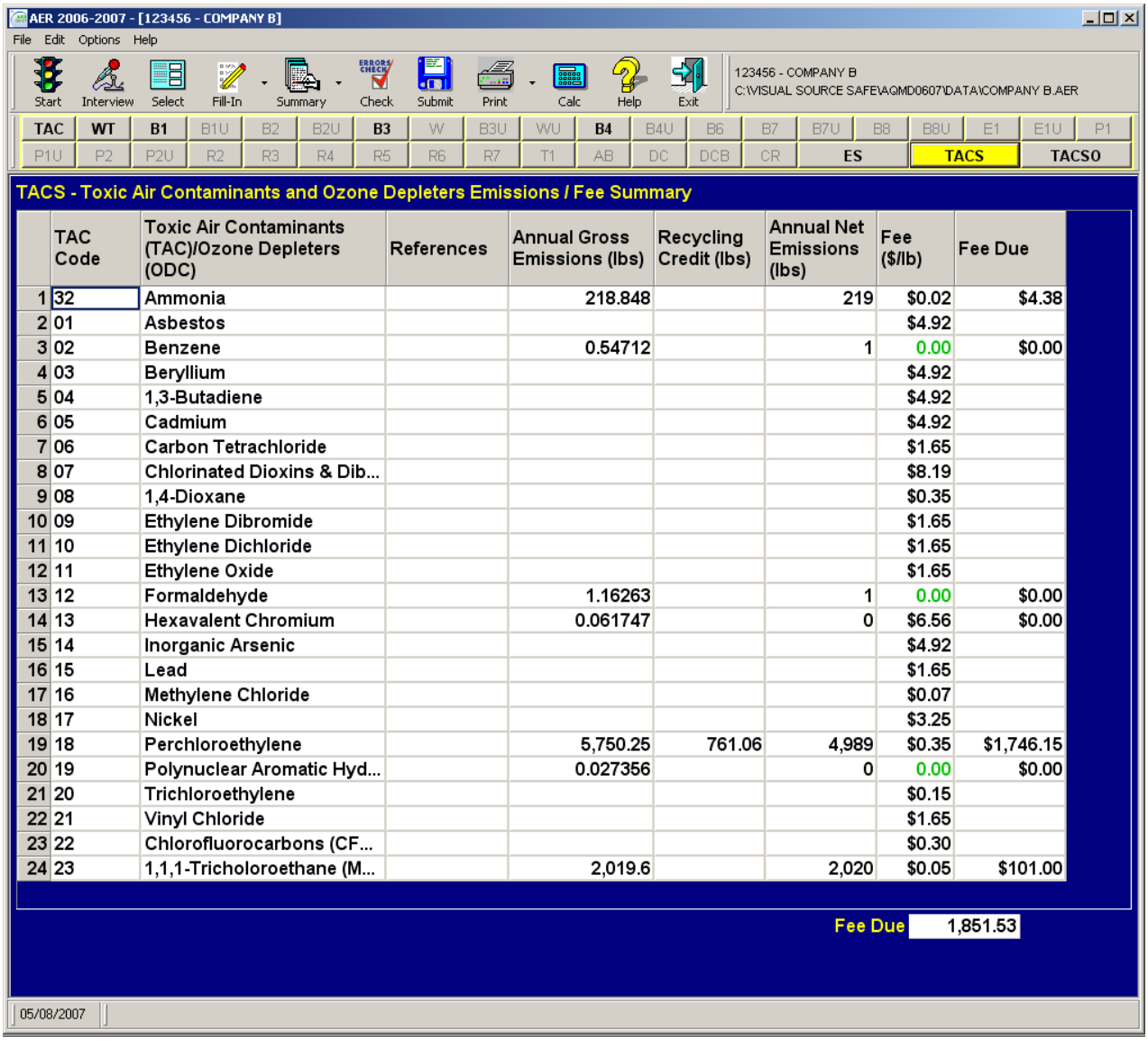
0.15 x 750 gallons x 13.53 lbs/gal x 50%/100% = 761.06 lbs.

Total credits in pounds are automatically transferred to form TACS (Example G) under TAC code "18".



Example (G): Form TACS - Toxic Air Contaminants/Ozone Depleters Emission/Fee Summary

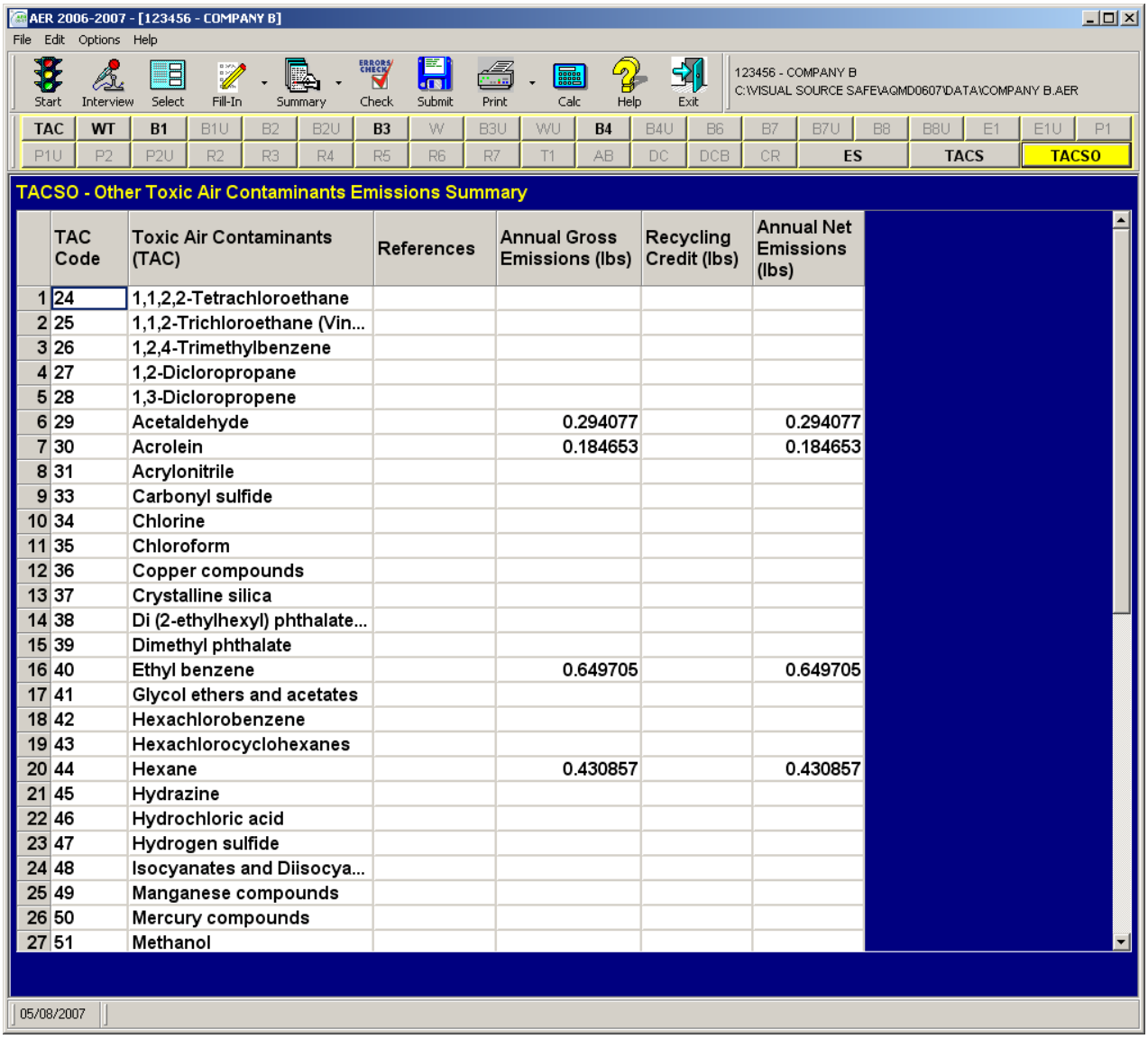
This form is designed to summarize total TAC/ODC emissions calculated on Form TAC for 24 compounds that incur toxic emission fees per Rule 301(e). Other toxic emissions are summarized on Form TACSO (Example H). Emissions on Form TACS are grouped by TAC code and totaled up for fee purposes. If specific TAC Code emissions are bellow the thresholds listed in Rule 301(e) Table IV, they will not incur any fees (in this case, "Fee ($/lb)" was automatically changed to zero for TAC codes 2, 12, and 19.) Form TACS is automatically filled out by the software based on information reported on forms TAC and WT. This example shows a credit for perc emissions as calculated on Form WT (Example F). The fee due is automatically transferred to Form S, line 2 (Example J).



	TAC Code	Toxic Air Contaminants (TAC)/Ozone Depleters (ODC)	References	Annual Gross Emissions (lbs)	Recycling Credit (lbs)	Annual Net Emissions (lbs)	Fee ($/lb)	Fee Due
1	32	Ammonia		218.848		219	$0.02	$4.38
2	01	Asbestos					$4.92	
3	02	Benzene		0.54712		1	0.00	$0.00
4	03	Beryllium					$4.92	
5	04	1,3-Butadiene					$4.92	
6	05	Cadmium					$4.92	
7	06	Carbon Tetrachloride					$1.65	
8	07	Chlorinated Dioxins & Dib...					$8.19	
9	08	1,4-Dioxane					$0.35	
10	09	Ethylene Dibromide					$1.65	
11	10	Ethylene Dichloride					$1.65	
12	11	Ethylene Oxide					$1.65	
13	12	Formaldehyde		1.16263		1	0.00	$0.00
14	13	Hexavalent Chromium		0.061747		0	$6.56	$0.00
15	14	Inorganic Arsenic					$4.92	
16	15	Lead					$1.65	
17	16	Methylene Chloride					$0.07	
18	17	Nickel					$3.25	
19	18	Perchloroethylene		5,750.25	761.06	4,989	$0.35	$1,746.15
20	19	Polynuclear Aromatic Hyd...		0.027356		0	0.00	$0.00
21	20	Trichloroethylene					$0.15	
22	21	Vinyl Chloride					$1.65	
23	22	Chlorofluorocarbons (CF...					$0.30	
24	23	1,1,1-Tricholoroethane (M...		2,019.6		2,020	$0.05	$101.00

Example (H): Form TACSO – Other Toxic Air Contaminants Emissions Summary

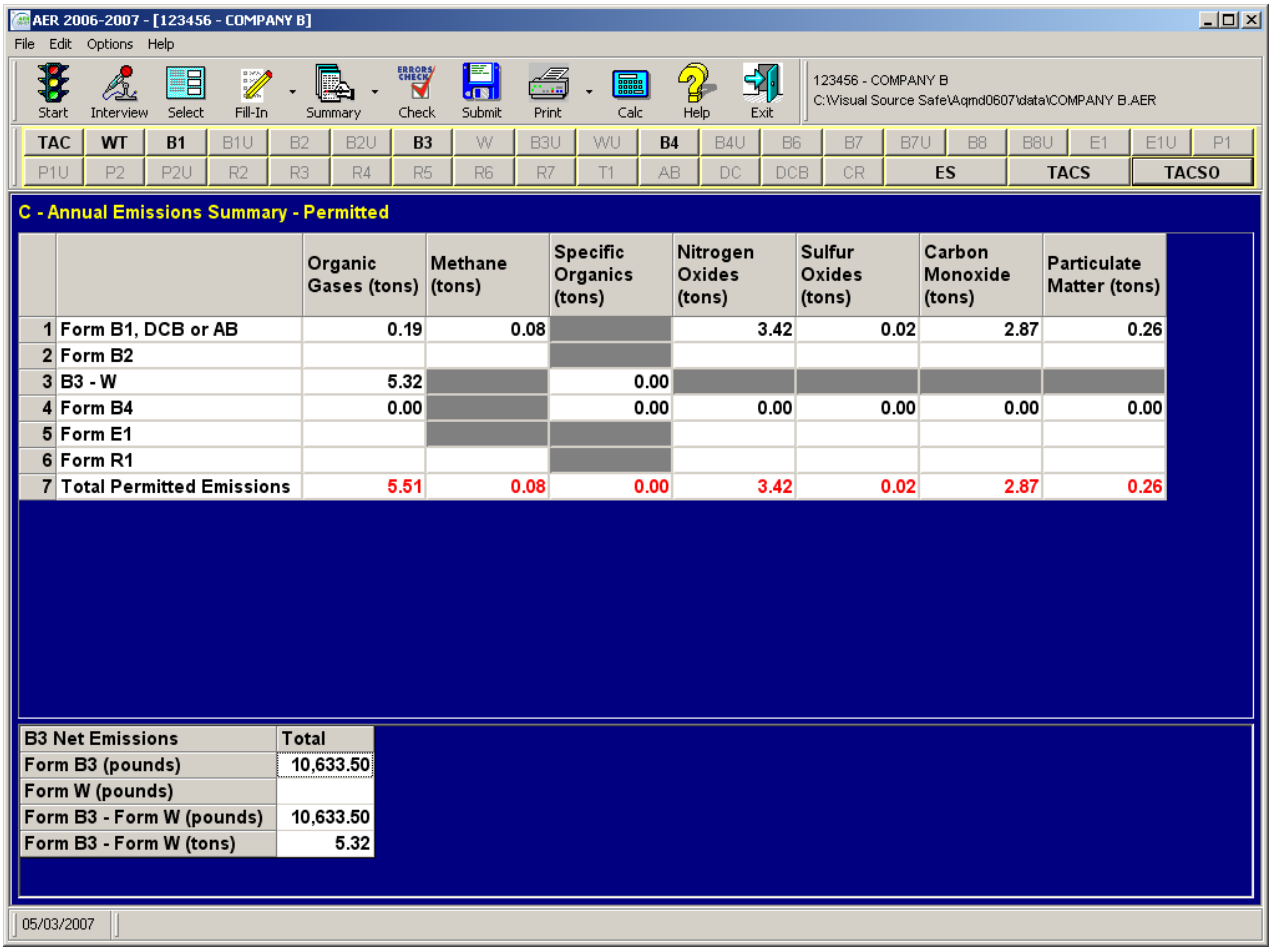
This form is designed to summarize total TAC emissions calculated on Form TAC for all TACs not summarized on Form TACS (i.e. TAC codes 24 to 31 and 33 to 73). Emissions on Form TACSO are grouped by TAC code and totaled up. Form TACSO is automatically filled out by the software based on information reported on forms TAC and WT.



	TAC Code	Toxic Air Contaminants (TAC)	References	Annual Gross Emissions (lbs)	Recycling Credit (lbs)	Annual Net Emissions (lbs)
1	24	1,1,2,2-Tetrachloroethane				
2	25	1,1,2-Trichloroethane (Vin...				
3	26	1,2,4-Trimethylbenzene				
4	27	1,2-Dicloropropane				
5	28	1,3-Dicloropropene				
6	29	Acetaldehyde		0.294077		0.294077
7	30	Acrolein		0.184653		0.184653
8	31	Acrylonitrile				
9	33	Carbonyl sulfide				
10	34	Chlorine				
11	35	Chloroform				
12	36	Copper compounds				
13	37	Crystalline silica				
14	38	Di (2-ethylhexyl) phthalate...				
15	39	Dimethyl phthalate				
16	40	Ethyl benzene		0.649705		0.649705
17	41	Glycol ethers and acetates				
18	42	Hexachlorobenzene				
19	43	Hexachlorocyclohexanes				
20	44	Hexane		0.430857		0.430857
21	45	Hydrazine				
22	46	Hydrochloric acid				
23	47	Hydrogen sulfide				
24	48	Isocyanates and Diisocya...				
25	49	Manganese compounds				
26	50	Mercury compounds				
27	51	Methanol				

Example (I): Form C - Permitted Annual Emissions Summary

Based on the information reported on different criteria forms as shown in the previous examples for Company "B", Form C is automatically completed by the software. Total emissions (tons), for each of the selected forms reporting permitted emissions, are transferred in the corresponding row on Form C. Totals per pollutant are calculated in line 7 and transferred to Form S, except for Methane (Example J).



		Organic Gases (tons)	Methane (tons)	Specific Organics (tons)	Nitrogen Oxides (tons)	Sulfur Oxides (tons)	Carbon Monoxide (tons)	Particulate Matter (tons)
1	Form B1, DCB or AB	0.19	0.08		3.42	0.02	2.87	0.26
2	Form B2							
3	B3 - W	5.32		0.00				
4	Form B4	0.00		0.00	0.00	0.00	0.00	0.00
5	Form E1							
6	Form R1							
7	Total Permitted Emissions	5.51	0.08	0.00	3.42	0.02	2.87	0.26

Example (J): Form S - Fees Due Summary

Based on the examples shown earlier for Company "B", the software automatically completes Form S as follows:

1. **Total Emissions**

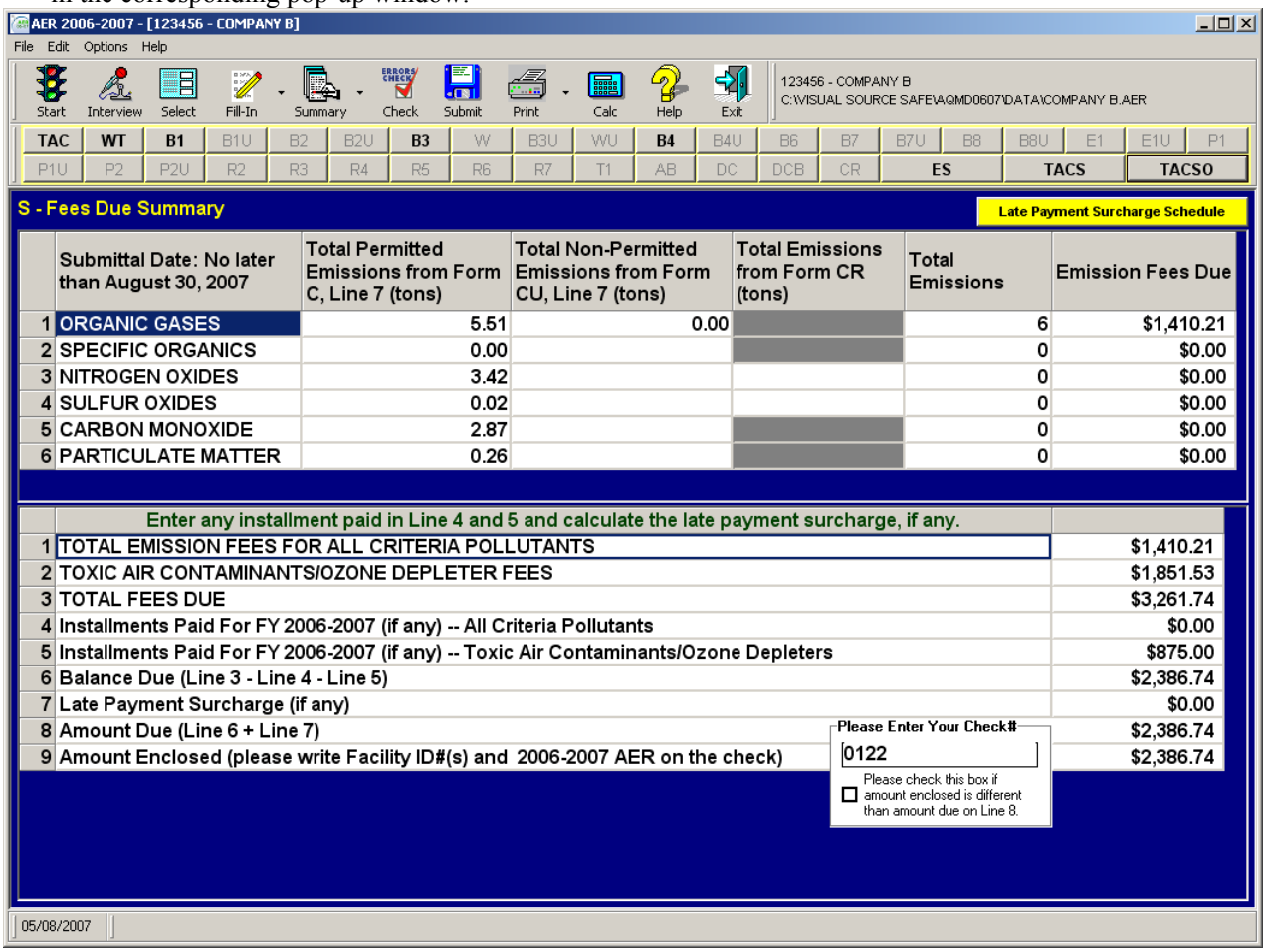
   Emissions from Line 7 of Form C are transferred to Form S. In this example Company "B" does not have any non-permitted emissions and is not identified as a RECLAIM facility. Total Emissions are summed up and rounded off according to the following instructions: if the total emissions for VOC, SPOG, NOx, SOx, and PM are less than 4 tons (less than 100 tons for CO), the software automatically populates the cells with 0; otherwise, it rounds off the calculated total emissions to the nearest ton as shown.

2. **Emission Fee**

   In this example, only organic gases (VOC) emissions exceed 4 tons. The software automatically populates the corresponding "Emission Fees due" cells according to the Emission Fee Table, Appendix M of the General Instruction Book.

   Total Fees Due (line 3) is the sum of total emission fees for all criteria pollutants automatically calculated in line 1 and toxic air contaminants/ozone depleter fees automatically transferred from form TACS to Form S, line 2. In this example, Company "B" made an installment payment in the amount of $875.00 for toxic emissions, which is accounted for on Line 5 and deducted from total fee due. The installment amount is NOT automatically transferred to form S and you must enter it at this point. The balance is displayed on Line 6. Company "B" filed the report and paid emission fees on time; therefore, no surcharges incur.

   The final due ($2,386.74) is issued by check # 0122 and submitted with the report. Enter the check number in the corresponding pop-up window.



Example (K): Form A - Status Update, Exemption Request, Refund Request, and Use of Alternative Emission Factors

This year Company "B" reduced its VOC emissions by 55% by switching to low-VOC enamel. The company informed the SCAQMD of that change by completing the Status Update part of the Interview process.

Form A is designed to collect information from different parts of the Interview process. After completing different Interview screens (e.g. Satus update, Exemption request, Refund request, Use of alternative factors or calculation methodologies), Company "B" printed out Form A (from the "Print" menu):

Form A - Status Update, Exemption Request, and Refund Request *AQMD 2006-2007 AER*

```
Facility ID     : 123456
Facility Name   : COMPANY B

STATUS UPDATES
     Shutdown Facility               : not applicable
     Change Of Ownership             : not applicable
     Change in Equipment Location    : not applicable
     Variance/Abatement Case Number  : not applicable
     Other Reason for Zero Emissions : (see below)
            VOC emissions were reduced by 55% by switching to Low-VOC Materials.

REFUND REQUEST
     Request refund for overpayment  : NO

EXEMPTION REQUEST
     Request for exemption           : not applicable

USE OF ALTERNATIVE EMISSION FACTORS OR CALCULATION METHODOLOGIES
     Not Applicable

CONTRACTOR INFORMATIONS
     Not Applicable
```

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Example (L): Form X - Signature Sheet

Company "B" has changed its phone number and mailing address, without any change to equipment location. Form X is completed as shown. **Note that this form must be signed by an authorized person to be valid.**

Form X is designed to collect information from different parts of the Interview process . After completing different Interview screens (e.g. Mailing Information, Contact Information, Preparer information, Authorized Person Information and Equipment Location Information), Company "B" printed out Form X (from the "Print" menu) and signed it.

Form X - Signature Sheet *AQMD 2006-2007 AER*

Software Submittal Signature Sheet
Submittal Date : No later than 8/30/2007

Facility ID : 123456
SIC Code : 3711

MAILING INFORMATION
John Doe
President
Company B
456 E Grand AVE, B
Sunny City, CA 98764
Contact Telephone : (714) 123-1234
Contact Fax : (714) 123-1235
Contact Email : johnd@companyb.com

AB 2588 reporting required : Yes
Closest Receptor:
Worker (ft) : 50
Residential (ft) : 250

EQUIPMENT LOCATION
Facility Name : COMPANY B
Equipment Location : 789 Broadway
City : Riverside

BRIEF DESCRIPTION OF OPERATION
Metal Product Manufacturing

BUSINESS OPERATING HOURS
Hours per day : 10
Days per week : 5
Weeks per year : 52

I declare under penalty of perjury that the data submitted truly represents throughput and emissions for this reporting period, and that the emission factors represent the best available data for my company in the calculation of annual emission figures.

Authorized Signature J Doe Date 8/15/07

Authorized Name : John Doe
Title : President
Phone : (714) 123-1234
Fax : (714) 123 1235
Email : johnd@companyb.com

Preparer Signature Date 8/01/07

Preparer Name : Franck Smith
Preparer Title : General Manager
Preparer Organization : Company B
Preparer Phone : (714) 123-1222 Ext: 101
Preparer Fax : (714) 123-1235
Preparer Email : fsmith@yahoo.com

S.C.A.Q.M.D reserves the right to audit the reported emissions. All records and calculations used in completing this summary are recommended to be retained a minimum of five years.

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