Table A-8. National Sulfur Dioxide Emissions Estimates, 1980, 1985, 1989–2000 (thousand short tons)

Source Category	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fuel Combustion	**21,391**	**20,021**	**19,924**	**20,290**	**19,796**	**19,493**	**19,245**	**18,887**	**16,230**	**16,232**	**16,649**	**16,746**	**16,027**	**14,876”**
FUEL COMB. ELEC. UTIL.	***17,469***	***16,272***	***16,215***	***15,909***	***15,784***	***15,416***	***15,189***	***14,889***	***12,080***	***12,730***	***13,195***	***13,416***	***12,653***	***11,389”***
Coal	16,073	15,630	15,404	15,220	15,087	14,824	14,527	14,313	11,603	12,206	12,615	12,470	11,826	10,723”
bituminous	NA	14,029	13,579	13,371	13,215	12,914	12,212	11,841	8,609	8,998	9,517	9,357	8,596	7,866”
subbituminous	*NA*	*1,292*	*1,422*	*1,415*	*1,381*	*1,455*	*1,796*	*1,988*	*2,345*	*2,632*	*2,490*	*2,486*	*2,609*	*2,367”*
anthracite & lignite	NA	309	404	434	491	455	519	484	649	576	608	627	621	489
Oil	1,395	612	779	639	652	546	612	522	413	460	514	762	639	511
residual	NA	604	765	629	642	537	601	512	408	454	509	756	631	502
distillate	*NA*	*8*	*14*	*10*	*10*	*9*	*10*	*10*	*5*	*6*	*5*	*6*	*7*	*8*
Gas	1	1	1	1	1	1	1	1	9	7	6	6	7	9
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	4	121	123	88
Internal Combustion	NA	30	30	49	45	46	49	53	55	53	56	57	58	59
FUEL COMB. INDUSTRIAL	***2,951***	***3,169***	***3,086***	***3,550***	***3,256***	***3,292***	***3,284***	***3,218***	***3,357***	***2,863***	***2,805***	***2,742***	***2,788***	***2,894”***
Coal	1,527	1,818	1,840	1,914	1,805	1,783	1,763	1,740	1,728	1,321	1,306	1,274	1,305	1,320”
bituminous	*1,058*	*1,347*	*1,384*	*1,050*	*949*	*1,005*	*991*	*988*	*1,003*	*885*	*877*	*858*	*878*	*889*
subbituminous	*326*	*28*	*29*	*50*	*53*	*60*	*67*	*77*	*81*	*63*	*63*	*61*	*64*	*64*
anthracite & lignite	*144*	*90*	*79*	*67*	*68*	*67*	*68*	*68*	*68*	*61*	*60*	*57*	*57*	*58*
other	*NA*	*353*	*348*	*746*	*735*	*650*	*636*	*606*	*576*	*312*	*306*	*298*	*306*	*309*
Oil	1,065	862	812	927	779	801	809	777	912	807	764	738	754	806
residual	*851*	*671*	*625*	*687*	*550*	*591*	*597*	*564*	*701*	*626*	*578*	*559*	*571*	*618*
distillate	*85*	*111*	*107*	*198*	*190*	*191*	*193*	*193*	*191*	*158*	*161*	*156*	*159*	*161*
other	129	80	80	42	39	20	20	20	20	23	25	23	24	27
Gas	299	397	346	543	516	552	555	542	548	575	582	578	575	609
Other	60	86	82	158	142	140	140	141	147	140	134	133	135	140
Internal Combustion	NA	7	6	9	14	16	17	19	23	20	19	19	20	20
FUEL COMB. OTHER	***971***	***579***	***624***	***831***	***755***	***784***	***772***	***780***	***793***	***639***	***649***	***588***	***586***	***593***
Commercial/Institutional Coal	110	158	169	212	184	190	193	192	200	179	184	196	196	200
Commercial/Institutional Oil	637	239	274	425	376	396	381	391	397	308	314	250	245	252
Commercial/Institutional Gas	1	2	2	7	7	7	8	8	8	10	10	10	11	11
Misc. Fuel Comb. (Except Residential)	NA	1	1	6	6	6	6	6	5	6	6	6	6	6
Residential Wood	13	13	11	7	7	8	6	6	7	5	5	5	5	5
Residential Other	211	167	167	175	176	177	178	177	176	131	130	121	123	119
distillate oil	157	128	132	137	141	144	145	145	144	108	106	97	98	95
bituminous/subbituminous coal	43	29	27	30	26	26	25	25	24	17	18	18	18	18
other	11	10	8	9	8	8	8	8	8	6	6	6	6	6
Industrial Processes	**3,807**	**2,467**	**2,010**	**1,900**	**1,720**	**1,758**	**1,723**	**1,675**	**1,638**	**1,408**	**1,458**	**1,463**	**1,457**	**1,498”**
CHEMICAL & ALLIED PRODUCT MFG	***280***	***456***	***440***	***297***	***280***	***278***	***269***	***275***	***286***	***255***	***259***	***261***	***262***	***268***
Organic Chemical Mfg	NA	16	17	10	9	9	9	8	8	4	4	4	4	5
Inorganic Chemical Mfg	271	354	334	214	208	203	191	194	199	173	176	178	179	183
sulfur compounds	*271*	*346*	*326*	*211*	*205*	*199*	*187*	*189*	*195*	*171*	*174*	*176*	*177*	*181*
other	*NA*	*8*	*8*	*2*	*3*	*4*	*4*	*4*	*4*	*2*	*2*	*2*	*2*	*2*
Polymer & Resin Mfg	NA	7	7	1	1	1	1	1	0	1	1	1	1	1
Agricultural Chemical Mfg	NA	4	4	5	4	4	4	4	5	1	1	1	1	1
Paint, Varnish, Lacquer, Enamel Mfg	NA	NA	NA	NA	NA	NA	0	0	0	0	0	0	0	0
Pharmaceutical Mfg	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Chemical Mfg	10	76	77	67	57	60	64	68	74	76	76	77	76	78

Table A-8. National Sulfur Dioxide Emissions Estimates, 1980, 1985, 1989–2000 (thousand short tons) (continued)

Source Category	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
METALS PROCESSING	***1,842***	***1,042***	***695***	***726***	***612***	***615***	***603***	***562***	***530***	***390***	***407***	***405***	***400***	***411***
Nonferrous Metals Processing	1,279	853	513	517	435	438	431	391	361	267	276	274	271	278
copper	*1,080*	*655*	*327*	*323*	*234*	*247*	*250*	*206*	*177*	*93*	*99*	*98*	*97*	*100*
lead	*34*	*121*	*113*	*129*	*135*	*131*	*122*	*128*	*126*	*112*	*113*	*114*	*114*	*116*
aluminum	*95*	*62*	*60*	*60*	*61*	*55*	*53*	*51*	*53*	*57*	*59*	*57*	*55*	*56*
other	*71*	*14*	*13*	*4*	*5*	*5*	*6*	*6*	*6*	*5*	*5*	*5*	*5*	*5*
Ferrous Metals Processing	562	172	165	186	159	158	153	153	151	107	114	114	112	116
Metals Processing NEC	NA	18	17	22	18	18	19	19	18	17	17	17	16	17
PETROLEUM & RELATED INDUSTRIES	***734***	***505***	***429***	***430***	***378***	***416***	***383***	***379***	***369***	***335***	***344***	***342***	***341***	***346***
Oil & Gas Production	157	204	156	122	98	93	98	95	89	90	90	90	90	92
natural gas	*157*	*202*	*155*	*120*	*96*	*92*	*96*	*93*	*88*	*89*	*90*	*89*	*89*	*92*
other	*NA*	*2*	*1*	*2*	*2*	*2*	*2*	*2*	*1*	*1*	*1*	*1*	*1*	*1*
Petroleum Refineries & Related Industries	577	300	272	304	274	315	278	276	271	238	246	245	244	246
fluid catalytic cracking units	*330*	*212*	*195*	*183*	*182*	*185*	*183*	*188*	*188*	*157*	*163*	*162*	*162*	*163*
other	*247*	*88*	*77*	*121*	*92*	*130*	*95*	*88*	*83*	*81*	*83*	*83*	*82*	*83*
Asphalt Manufacturing	NA	1	1	4	7	7	7	8	9	8	8	8	7	7
OTHER INDUSTRIAL PROCESSES	***918***	***425***	***405***	***399***	***396***	***396***	***392***	***398***	***403***	***390***	***409***	***415***	***414***	***432***
Agriculture, Food, & Kindred Products	NA	3	3	3	3	3	3	3	3	4	4	4	5	5
Textiles, Leather, & Apparel Products	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Wood, Pulp & Paper, & Publishing Prods	223	131	136	116	123	119	113	109	114	101	105	107	109	113
Rubber & Miscellaneous Plastic Prods	NA	1	1	0	0	0	0	0	0	1	1	1	1	1
Mineral Products	694	286	261	275	267	270	272	282	282	270	285	288	284	299
cement mfg	*630*	*192*	*172*	*181*	*165*	*168*	*170*	*167*	*171*	*171*	*181*	*183*	*179*	*189*
other	*64*	*95*	*89*	*94*	*102*	*102*	*102*	*114*	*111*	*99*	*103*	*105*	*105*	*109*
Machinery Products	NA	0	0	0	0	1	0	1	1	0	0	0	0	0
Electronic Equipment	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous Industrial Processes	NA	3	3	5	3	3	3	3	4	13	13	14	14	14
SOLVENT UTILIZATION	***NA***	***1***	***1***	***0***	***0***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***
Degreasing	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Graphic Arts	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Dry Cleaning	NA	NA	NA	NA	NA	0	NA	0	0	0	0	0	0	0
Surface Coating	NA	1	1	0	0	0	0	0	0	0	0	0	0	0
Other Industrial	NA	0	0	0	0	0	0	0	0	1	1	1	1	1
STORAGE & TRANSPORT	***NA***	***4***	***5***	***7***	***10***	***9***	***5***	***2***	***2***	***5***	***5***	***5***	***5***	***5***
Bulk Terminals & Plants	NA	NA	NA	0	1	1	0	0	0	1	1	1	1	1
Petroleum & Petroleum Product Storage	NA	0	0	5	7	0	0	0	0	0	0	0	0	0
Petroleum & Petroleum Product Transport	NA	1	1	0	0	0	0	0	0	1	1	2	2	2
Service Stations: Stage II	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0	0	0
Organic Chemical Storage	NA	1	1	0	0	0	0	0	0	0	0	0	0	0
Organic Chemical Transport	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Inorganic Chemical Storage	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Inorganic Chemical Transport	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Bulk Materials Storage	NA	1	2	1	1	7	4	1	1	2	2	2	2	2

Table A-8. National Sulfur Dioxide Emissions Estimates, 1980, 1985, 1989–2000 (thousand short tons)

Source Category	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
WASTE DISPOSAL & RECYCLING	***33***	***34***	***36***	***43***	***44***	***44***	***71***	***59***	***47***	***32***	***33***	***34***	***34***	***35***
Incineration	21	25	28	32	32	32	51	42	35	26	27	28	28	29
industrial	*NA*	*10*	*10*	*5*	*4*	*5*	*25*	*17*	*8*	*6*	*6*	*7*	*7*	*7*
other	*21*	*15*	*18*	*26*	*28*	*27*	*26*	*26*	*27*	*20*	*21*	*21*	*21*	*22*
Open Burning	12	9	8	11	11	11	11	11	11	5	5	5	5	5
industrial	*NA*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
land clearing debris	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
other	*12*	*8*	*7*	*10*	*10*	*11*	*11*	*11*	*11*	*5*	*5*	*5*	*5*	*5*
POTW	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Industrial Waste Water	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
TSDF	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Landfills	NA	0	0	0	0	0	0	0	0	1	1	1	1	1
industrial	*NA*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
other	*NA*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other	NA	0	0	0	1	1	8	6	0	0	0	0	0	0
Transportation	**697**	**1,159**	**1,349**	**1,476**	**1,517**	**1,553**	**1,497**	**1,297**	**1,311**	**1,791**	**1,816**	**1,837**	**1,853**	**1,805**
ON-ROAD VEHICLES	***521***	***522***	***570***	***560***	***573***	***586***	***526***	***307***	***311***	***343***	***353***	***358***	***366***	***314***
Light-Duty Gas Vehicles & Motorcycles	159	146	145	129	126	125	124	125	126	128	131	134	136	108
light-duty gas vehicles	*158*	*145*	*145*	*128*	*126*	*125*	*124*	*124*	*126*	*128*	*130*	*134*	*136*	*107*
motorcycles	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Light-Duty Gas Trucks	50	55	58	69	81	87	90	92	93	85	89	90	94	75
light-duty gas trucks 1	*33*	*36*	*38*	*45*	*52*	*56*	*58*	*59*	*60*	*62*	*65*	*66*	*69*	*55*
light-duty gas trucks 2	*16*	*19*	*21*	*24*	*29*	*31*	*32*	*32*	*32*	*22*	*23*	*24*	*24*	*20*
Heavy-Duty Gas Vehicles	10	11	11	10	10	10	11	12	11	18	18	17	17	13
Diesels	303	311	356	352	356	364	300	79	82	112	117	117	119	118
NON-ROAD ENGINES AND VEHICLES	***175***	***637***	***779***	***916***	***944***	***968***	***972***	***990***	***999***	***1,448***	***1,463***	***1,479***	***1,487***	***1,491***
Non-Road Gasoline	NA	20	22	22	22	22	23	23	23	35	35	35	35	35
Non-Road Diesel	NA	407	488	509	529	549	570	590	610	459	474	490	497	516
Aircraft	6	6	7	11	11	11	11	11	11	8	8	8	8	8
Marine Vessels	117	143	193	251	259	258	249	252	239	887	887	887	887	872
Railroads	53	59	67	122	120	125	117	113	113	56	56	56	56	56
Non-Road Other	NA	1	2	2	2	2	2	2	2	3	3	3	4	4
MISCELLANEOUS	***11***	***11***	***11***	***12***	***11***	***10***	***10***	***15***	***10***	***16***	***15***	***12***	***12***	***21***
Agriculture & Forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
Other Combustion	11	11	11	12	11	9	9	15	10	16	15	12	12	21
Fugitive Dust	NA	NA	NA	0	0	0	1	0	0	0	0	0	0	0
TOTAL ALL SOURCES	**25,905**	**23,658**	**23,293**	**23,679**	**23,044**	**22,813**	**22,474**	**21,875**	**19,189**	**19,497**	**19,943**	**20,052**	**19,390**	**16,702**

Note: Some columns may not sum to totals due to rounding.