Appendix C
Volatile organic chemicals in air — summary of background databases

A detailed description of each background database introduced in Section 3.2.4 is provided in this appendix.

C.1 NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes

Between 1997 and 2003, the New York State Department of Health (NYSDOH) conducted a study of the occurrence of volatile organic chemicals (VOCs) in the indoor air of homes that heat with fuel oil. The purpose of the study was to characterize the indoor environment of fuel oil heated homes as a means of evaluating post clean-up conditions in residences affected by petroleum spills. The study included basement, living space and outdoor samples from 104 homes, tested during both heating and non-heating seasons. Most of the more than 600 samples collected in the study were analyzed for 69 individual VOCs. This summary report presents the results to help characterize commonly found concentrations of these 69 compounds in the indoor and outdoor air of residential settings heated with fuel oil.

The study is comprised of single family homes heated with fuel oil. With the exception of New York City, homes from across the state were included in the study, with the majority of the homes being near the Albany area. Prospective residences were required to have no past oil spills, no hobbies or home business that regularly use products containing VOCs, and no recent activities utilizing products that contain VOCs (e.g. painting, staining). A pre-sampling inspection was conducted in each home and included completing a building questionnaire to gather building information such as age, basement characteristics, heating and ventilation parameters, location of fuel oil tank, garage placement, etc. and an inventory of products that might be sources of indoor VOCs. When present, the products and their ingredients were listed on the inventory form. In addition, the product containers were screened with a photoionization detector (PID) to identify potential chemical interference during each sampling event and elevated readings were noted on the inventory forms. In most homes, gross sources of VOCs were not identified and containers were generally found to be sealed tightly. In some homes the PID detected elevated VOC levels associated with a product; however, the products were not removed and samples were still collected.

Sampling was performed in a manner consistent with the NYSDOH's February 1, 2005, Indoor Air Sampling and Analysis Guidance (available on the NYSDOH's web site at http://www.health.state.ny.us/nysdoh/indoor/guidance.htm). Two-hour samples were collected in 6-liter pre-cleaned, passivated, evacuated whole air canisters prepared and analyzed at the NYSDOH’s Wadsworth Center laboratory. The samples were analyzed in accordance with EPA Method TO-15 utilizing a Tekmar® AutoCan® concentrator / Agilent® 6890/5973 GC/MSD analytical system. The method detection limits for all compounds except hexachlorobutadiene were 0.25 micrograms per cubic meter (mcg/m^3). The method detection limit for hexachlorobutadiene was 0.43 mcg/m^3.

The dataset exhibits a lognormal distribution typical of environmental data. Table C1 provides a summary of the indoor and outdoor air data. It contains the mean, 25th, 50th, 75th, 90th percentile values and the upper fence value for each compound. The upper fence is calculated as 1.5 times the interquartile range (difference between the 25th and 75th percentile values) above the 75th percentile value. The upper fence is a boundary used for identifying the presence of outliers in the data. In cases where the 25th or 75th percentiles were below the laboratory detection limit of 0.25 mcg/m^3, randomly generated values between 0.000 and 0.250 were used in calculating the upper fence. All of the values calculated for the lower fence were negative and are not included in the table. For hexachlorobutadiene, the randomly generated values used to calculate the upper fence ranged from 0.000 to 0.430. All of the values are adjusted to two significant figures. A summary of the study can be obtained at the NYSDOH's web site: http://www.health.state.ny.us/nysdoh/indoor/fuel_oil.htm.

C.2 EPA 2001: Building Assessment and Survey Evaluation (BASE) Database

From 1994 through 1996, the EPA conducted a study of indoor air quality referred to as the Building Assessment and Survey Evaluation (BASE '94-'96). The study included measurement of VOCs, radon, formaldehyde, carbon monoxide, carbon dioxide, and particulates in indoor and outdoor air at 100 randomly selected public and commercial office buildings across the United States. Each building was sampled for a one-week period in either winter or summer. Buildings had a targeted occupancy of no less than 50 full-time employees and were served by no more than two air handling units. Physical characteristics of the buildings such as size, age, construction and heating and ventilation parameters were recorded. Ambient sources of VOCs were also characterized for the entire building and in the individual sample locations. The study excluded any buildings with highly publicized indoor air quality complaints; therefore, data from the study should be representative of conventional office buildings.

Two methods were used to measure VOC concentrations in the BASE study. Air samples were collected into passivated, evacuated whole air canisters (SUMMA®, TO-Can®, etc.) from all 100 buildings. In addition, air samples were concurrently collected on multisorbent tubes from 70 of the 100 buildings. Six-liter canister air samples were collected over a nominal nine-hour period and analyzed by gas chromatography/mass spectroscopy using EPA Method TO-14. The multisorbent tubes were filled with glass beads, Tenax TA, Ambersorb XE-340, and activated carbon and 2.5 liters of ambient air were collected over an eight-hour period. The tube samples were thermally desorbed and analyzed by gas chromatography/mass spectrometry using EPA Method TO-1. Method reporting limits ranged from 0.2 to 7.0 mcg/m^3.

BASE '94-'96 VOC data was received from the EPA in late 2001. Minimum, maximum, means and the 25th, 50th, 75th, 90th, 95th and 99th percentile values were calculated. For data analysis, all voided samples, blank samples, and samples that could not be analyzed were removed. The result for any sample or analyte that was marked as below the detection limit was assigned the value of one half the detection limit. Buildings in the BASE '94-'98 study generally had three indoor air VOC samples and one VOC outdoor sample for each method. Table C2 provides a summary of the indoor and outdoor air samples analyzed by SUMMA® canisters only. The table will be revised after EPA releases their final version of the study.

C.3 NYSDOH 1997: Control Home Database

From 1989-1996, the NYSDOH collected 228 indoor and outdoor air samples from 53 residences used as control homes in New York State investigations. Control homes were defined and selected to represent homes with neighborhood, construction, and occupancy similar to homes being investigated for VOC impacts on indoor air. Control homes also had no unusual source of VOCs, such as a past oil spill, recent refinishing or painting activities, or proximity to the VOC source being investigated.

Air samples in control homes were collected from the basement, a room considered a living space (such as a living room, dining room, or bedroom), and outdoors. An inventory of recent activities, stored household products and heating fuel type was made at the time of sampling. Air samples were collected by one of two methods: 6-liter pre-cleaned, passivated, evacuated whole air canisters (SUMMA®, TO-Can®, etc.), analyzed with Method TO-14 (EPA 1988), or Porapak adsorbent tubes, analyzed using NYSDOH method 311-6 (NYSDOH 1991). Through 1992, both methods were used about equally. After 1992, most samples were collected with Summa® canisters. About 20% of the samples were collected with a sampling time of 12 hours. The rest of the samples had sampling times of one to four hours. The NYSDOH Wadsworth Center Laboratories analyzed all samples.

The reporting limits for some compounds in samples from 1989 and 1990 were sometimes higher than 10 mcg/m^3. Analyses where compounds were reported as not detected with reporting limits greater than 10 mcg/m^3 were excluded from the database. In the 1990s reporting limits were lowered (due to improvements made in analytical equipment and methods) and some compounds were detected more frequently. Data from the later years of this study demonstrated that median levels of all compounds (except toluene) were less than 10 mcg/m^3.

The minimum, maximum, mean, median, 5^{th}, 25^{th}, 50th, 75^{th}, 95^{th} and 99^{th} percentiles were calculated. To calculate these descriptive statistics, compounds not detected in the samples and compounds reported as present but less than the reporting limit were assigned a value equal to one half the reporting limit. Table C3 provides a summary of these data.

C.4 EPA 1988: National Ambient Volatile Organic Compounds (VOCs) Data Base Update

This database is a compilation of available air data published for the EPA in 1988. The document includes data from the original EPA database published in 1983 (Brodzinsky and Singh, 1983), which was an evaluation of 241 published reports from the years 1970 to 1980. Additional published and unpublished data for VOCs were also evaluated and included through 1987. The database covers the concentrations of more than 300 VOCs in outdoor (urban, rural, remote, source-dominated) and indoor settings. Indoor air data are limited to residential and office space, and excludes studies of emissions or sources, solely health-related studies, laboratory or modeling studies, and industrial workplace studies. Outdoor air data are limited to locations beyond the fence line of industrial and commercial facilities releasing VOCs.

Each data record includes maximum and minimum concentrations; the total number of measurements included in the average and the number of those that were below the detection limit or equal to zero. The 25^{th}, 50^{th} (median) and 75^{th} percentiles were also calculated. Table C4 provides a summary of these data for a limited number of compounds reported in the publication.

C.5 Health Effects Institute 2005: Relationship of Indoor, Outdoor and Personal Air

The Relationships of Indoor, Outdoor and Personal Air (RIOPA) study was designed to provide information in assessing the possible public health risks from air toxics and particulate matter in the urban environment for a large number of VOCs, carbonyl compounds and $PM_{2.5}$. The investigators measured indoor, outdoor and personal exposure concentrations of 16 VOCs, 10 carbonyls and PM during two 48-hour sampling periods in different seasons between the summer of 1999 and the spring of 2001. The study included 100 homes with 100 adult residents in each of three cities with different air pollution sources and weather conditions: Los Angeles, CA; Houston, TX; and Elizabeth, NJ. Children in each of the homes sampled were recruited to the best extent practical. Only 18 VOCs are summarized in this guidance document (Table C5). Refer to the original RIOPA report (Weisel *et al.*, 2005) for information about the carbonyl and particulate matter sampling and results.

The report (1) compares concentrations of the pollutants measured in indoor, outdoor and personal air, (2) examined the effects of city , season, type of home, and other variables on measured concentrations, and (3) quantified how much outdoor sources contributed to the indoor concentrations using measurements of outdoor-indoor air exchange rates.

All the VOC air samples were collected on 3M Brand Organic Vapor Monitor (OVM) badges. The badges are passive sampling devices that allow VOCs in air to pass through a diffusion membrane and are adsorbed onto carbon impregnated pads. A solvent is used to extract the VOCs from the pad and the extract is analyzed by gas chromatography/mass spectroscopy.

The published report provides descriptive summary statistics for all the tested compounds and parameters including: sample size, mean and standard deviation. Concentrations are also provided for the 1^{st}, 5^{th}, 50^{th} (median), 95^{th}, and 99^{th} percentile. Table C5 provides a summary of the indoor, outdoor, adult and child personal air data for 16 VOCs and 2 carbonyl compounds.

C.6 References

Brodzinsky, R., and H.B. Singh. 1983. "Volatile Organic Chemicals in the Atmosphere: an Assessment of Available Data" (EPA-600/3-83-027(A)). Environmental Sciences Research Laboratory, Research Triangle Park, NC.

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New York State Department of Health. 1997. "Background Indoor/Outdoor Air Levels of Volatile Organic Compounds in Homes Sampled by the New York State Department of Health, 1989-1996." Bureau of Toxic Substance Assessment, Troy, NY.

United States Environmental Protection Agency. 1988. "Compendium Method TO-14. The Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Summa Passivated Canister Sampling and Chromatographic Analysis." Environmental Monitoring Systems Laboratory, Research Triangle Park, NC.

United States Environmental Protection Agency. 2001. "Draft: A standard EPA protocol for characterizing indoor air quality in large buildings." Office of Air and Radiation, Washington, DC.

Weisel, C. P., J. Zhang, B. J. Turpin, M. T. Morandi, S. Colome, T. H. Stock, D. M. Spektor and Others. 2005. "Relationships of Indoor, Outdoor, and Personal Air (RIOPA)." Health Effects Institute, Boston, MA and National Urban Air Toxics Research Center, Houston, TX.

Table C1. NYSDOH 2003: Study of volatile organic chemicals in air of fuel oil heated homes

All results are micrograms per cubic meter (mcg/m^3).

Compound	INDOOR AIR												
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max	Upper F
1,1,1-TRICHLOROETHANE	166	41.5%	400	2	<0.25	<0.25	0.3	1.1	3.1	6.9	41	110	2.5
1,1,2,2-TETRACHLOROETHANE	386	96.5%	400	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.8	2.7	0.4
1,1,2-TRICHLOROETHANE	384	96.0%	400	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	1	6.2	0.4
1,1,2-TRICHLOROTRIFLUOROETHANE	178	44.5%	400	0.8	<0.25	<0.25	0.5	1.1	1.8	3.4	5.9	7.4	2.5
1,1-DICHLOROETHANE	396	99.0%	400	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.4	4.4	0.4
1,1-DICHLOROETHENE	373	93.3%	400	1.4	<0.25	<0.25	<0.25	<0.25	<0.25	0.7	6.3	430	0.4
1,2,3-TRIMETHYLBENZENE	164	41.0%	400	1.2	<0.25	<0.25	0.4	1.1	2.7	5	11	37	2.5
1,2,4-TRICHLOROBENZENE	319	79.8%	400	1.3	<0.25	<0.25	<0.25	<0.25	3.4	6.3	26	37	0.5
1,2,4-TRIMETHYLBENZENE	49	12.3%	400	4.8	<0.25	0.7	1.9	4.3	9.5	18	35	260	9.8
1,2-DIBROMOETHANE	397	99.3%	400	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	1.1	0.4
1,2-DICHLOROBENZENE	315	78.8%	400	0.3	<0.25	<0.25	<0.25	<0.25	0.7	1	2.3	4.9	0.5
1,2-DICHLOROETHANE	394	98.5%	400	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.4	4.9	0.4
1,2-DICHLOROPROPANE	391	97.8%	400	0.4	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	9	34	0.4
1,2-DICHLOROTETRAFLUOROETHANE	349	87.3%	400	1	<0.25	<0.25	<0.25	<0.25	0.5	1.2	23	120	0.4
1,3,5-TRIMETHYLBENZENE	100	25.0%	400	2	<0.25	0.3	0.6	1.7	3.6	6.5	25	97	3.9
1,3-DICHLOROBENZENE	316	79.0%	400	0.3	<0.25	<0.25	<0.25	<0.25	0.6	0.9	1.6	2.5	0.5
1,4-DICHLOROBENZENE	266	66.5%	400	3.7	<0.25	<0.25	<0.25	0.5	1.3	2.6	24	770	1.2
2,3-DIMETHYLPENTANE	129	32.3%	400	3.8	<0.25	<0.25	0.7	2.2	7.5	16	50	210	5.2
2,4-DIMETHYLPENTANE	143	35.8%	400	3.2	<0.25	<0.25	0.6	2	7.7	15	52	120	4.7
ACETONE	12	5.3%	227	42	<0.25	9.9	21	52	110	140	200	690	115
ALPHA-PINENE	79	19.8%	400	5.8	<0.25	0.3	1.5	4.4	14	27	63	91	10
BENZENE	28	7.0%	400	8.3	<0.25	1.1	2.1	5.9	15	29	120	460	13
BROMOMETHANE	308	77.0%	400	0.3	<0.25	<0.25	<0.25	<0.25	0.6	0.9	3.2	23	0.5
CARBON TETRACHLORIDE	201	50.3%	400	0.4	<0.25	<0.25	<0.25	0.6	0.8	1.1	3.2	4.2	1.3
CHLOROBENZENE	398	99.5%	400	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.6	0.4
CHLOROETHANE	361	90.3%	400	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	0.6	0.9	4.5	0.4
CHLOROFORM	212	53.0%	400	0.9	<0.25	<0.25	<0.25	0.5	1.4	4.6	13	25	1.2
CHLOROMETHANE	184	46.0%	400	2	<0.25	<0.25	0.5	1.8	3.3	5.2	14	260	4.2
CIS-1,2-DICHLOROETHENE	364	91.0%	400	0.3	<0.25	<0.25	<0.25	<0.25	<0.25	1.2	4.6	7.4	0.4
CIS-1,3-DICHLOROPROPENE	388	97.0%	400	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	2.1	3.5	0.4
CYCLOHEPTANE	159	39.8%	400	1.2	<0.25	<0.25	0.5	1.3	3.1	5.1	11	23	2.9
CYCLOHEXANE	125	31.3%	400	6	<0.25	<0.25	0.8	2.6	8.1	19	88	510	6.3
DICHLORODIFLUOROMETHANE	215	53.8%	400	7.9	<0.25	<0.25	<0.25	4.1	15	26	180	300	10
d-LIMONENE	77	19.3%	400	8.9	<0.25	0.5	2.8	8.4	24	45	93	120	20
ETHYL ALCOHOL	3	1.3%	227	610	<0.25	27	160	540	1400	3000	6900	16000	1300
ETHYLBENZENE	58	14.5%	400	3.7	<0.25	0.4	1	2.8	7.3	13	26	340	6.4
ETHYLCYCLOHEXANE	149	37.3%	400	1.1	<0.25	<0.25	0.4	1.2	2.6	4.4	10	28	2.8

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Table C1. NYSDOH 2003: Study of volatile organic chemicals in air of fuel oil heated homes -- Continued

All results are micrograms per cubic meter (mcg/m^3).

Compound	INDOOR AIR												
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max	Upper F
ETHYLMETHACRYLATE	215	94.7%	227	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	0.3	1	2.9	0.4
HEXACHLORO-1,3-BUTADIENE	304	76.0%	400	1.8	<0.25	<0.25	<0.25	<0.25	4.6	11	29	51	0.5
ISO-OCTANE	130	32.5%	400	5.5	<0.25	<0.25	0.6	2.1	6.5	14	63	870	5.0
ISOPRENE	44	11.0%	400	4.1	<0.25	0.8	2	4.3	8.8	15	43	81	9.5
ISOPROPYLBENZENE	259	64.8%	400	0.4	<0.25	<0.25	<0.25	0.4	0.9	1.3	2.7	27	0.8
M,P-XYLENE	54	13.5%	400	5.9	<0.25	0.5	1.5	4.6	12	21	46	550	11
METHYL ETHYL KETONE	20	8.8%	227	8.4	<0.25	1.4	3.4	7.3	16	39	79	180	16
METHYL ISOBUTYL KETONE	102	44.9%	227	1.2	<0.25	<0.25	0.3	0.9	2.2	5.3	16	36	1.9
METHYLCYCLOHEXANE	112	28.0%	400	4.9	<0.25	<0.25	0.7	1.9	6.4	12	32	620	4.5
METHYLENE CHLORIDE	89	22.3%	400	17	<0.25	0.3	1.4	6.6	22	45	310	2100	16
METHYLMETHACRYLATE	197	86.8%	227	0.6	<0.25	<0.25	<0.25	<0.25	0.4	1.1	5.3	66	0.4
METHYL-tert-BUTYL ETHER	69	30.4%	227	13	<0.25	<0.25	0.8	5.6	26	71	230	340	14
n-BUTYLBENZENE	222	55.5%	400	0.6	<0.25	<0.25	<0.25	0.5	1.2	2.1	4.9	33	1.1
n-DECANE	40	10.0%	400	7.7	<0.25	1.2	2.7	6.6	16	31	83	190	15
n-DODECANE	73	18.3%	400	5.6	<0.25	0.4	1.5	3.9	11	19	61	420	9.2
n-HEPTANE	19	4.8%	400	9.7	<0.25	1	2.8	7.6	19	33	72	670	18
n-HEXANE	50	12.5%	400	9.5	<0.25	0.6	1.6	5.9	18	35	93	950	14
n-NONANE	65	16.3%	400	3.8	<0.25	0.4	1.3	3.4	8.8	13	50	89	7.9
n-OCTANE	84	21.0%	400	1.9	<0.25	0.3	0.9	2.3	4.2	5.5	16	80	5.2
n-PROPYLBENZENE	206	51.5%	400	0.8	<0.25	<0.25	<0.25	0.7	1.7	2.8	8.2	41	1.5
n-UNDECANE	59	14.8%	400	5.4	<0.25	0.6	1.8	5	12	20	61	290	12
O-XYLENE	71	17.8%	400	3.8	<0.25	0.4	1.1	3.1	7.6	13	32	310	7.1
sec-BUTYLBENZENE	225	56.3%	400	0.5	<0.25	<0.25	<0.25	0.6	1.2	1.7	4.1	11	1.2
STYRENE	175	43.8%	400	0.8	<0.25	<0.25	0.3	0.6	1.3	2.3	6.2	50	1.4
tert-BUTYLBENZENE	228	57.0%	400	0.7	<0.25	<0.25	<0.25	0.6	1.6	2.8	5.3	36	1.3
TETRACHLOROETHENE	187	46.8%	400	1.3	<0.25	<0.25	0.3	1.1	2.9	4.1	20	51	2.5
TETRAHYDROFURAN	164	72.2%	227	2.1	<0.25	<0.25	<0.25	0.4	3.3	9.4	19	180	0.8
TOLUENE	25	6.3%	400	26	<0.25	3.5	9.6	25	58	110	300	510	57
TRANS-1,3-DICHLOROPROPENE	400	100.0%	400	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NC
TRICHLOROETHENE	323	80.8%	400	0.4	<0.25	<0.25	<0.25	<0.25	0.5	0.8	7.4	25	0.5
TRICHLOROFLUOROMETHANE	42	10.5%	400	7.5	<0.25	1.1	2.9	5.4	17	30	95	190	12
VINYL CHLORIDE	387	96.8%	400	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.8	1	0.4

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Table C1. NYSDOH 2003: Study of volatile organic chemicals in air of fuel oil heated homes -- Continued

All results are micrograms per cubic meter (mcg/m^3).

Compound	OUTDOOR AIR												
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max	Upper F
1,1,1-TRICHLOROETHANE	125	62.5%	200	0.3	<0.25	<0.25	<0.25	0.3	0.6	0.7	3.8	8.4	0.6
1,1,2,2-TETRACHLOROETHANE	199	99.5%	200	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.5	0.4
1,1,2-TRICHLOROETHANE	199	99.5%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	6.3	0.3
1,1,2-TRICHLOROTRIFLUOROETHANE	97	48.5%	200	0.9	<0.25	<0.25	0.5	1.1	1.9	3.6	6	11	2.5
1,1-DICHLOROETHANE	200	100.0%	200	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NC
1,1-DICHLOROETHENE	199	99.5%	200	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	1	0.4
1,2,3-TRIMETHYLBENZENE	165	82.5%	200	0.2	<0.25	<0.25	<0.25	<0.25	0.4	0.6	1.4	2.5	0.5
1,2,4-TRICHLOROBENZENE	168	84.0%	200	0.8	<0.25	<0.25	<0.25	<0.25	2.3	4.8	12	21	0.4
1,2,4-TRIMETHYLBENZENE	109	54.5%	200	0.9	<0.25	<0.25	<0.25	0.8	1.7	2.5	8.2	50	1.9
1,2-DIBROMOETHANE	199	99.5%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	8.2	0.4
1,2-DICHLOROBENZENE	166	83.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	0.6	0.9	1.6	6.1	0.4
1,2-DICHLOROETHANE	199	99.5%	200	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.3	0.4
1,2-DICHLOROPROPANE	194	97.0%	200	0.4	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	11	22	0.4
1,2-DICHLOROTETRAFLUOROETHANE	169	84.5%	200	0.3	<0.25	<0.25	<0.25	<0.25	0.6	1.3	2.4	4.5	0.5
1,3,5-TRIMETHYLBENZENE	143	71.5%	200	0.3	<0.25	<0.25	<0.25	0.3	0.7	1	2.4	2.5	0.7
1,3-DICHLOROBENZENE	170	85.0%	200	0.3	<0.25	<0.25	<0.25	<0.25	0.5	0.7	1.6	10	0.4
1,4-DICHLOROBENZENE	164	82.0%	200	0.3	<0.25	<0.25	<0.25	<0.25	0.5	0.8	1.8	7.1	0.5
2,3-DIMETHYLPENTANE	147	73.5%	200	0.5	<0.25	<0.25	<0.25	0.3	1	2	8.6	13	0.7
2,4-DIMETHYLPENTANE	139	69.5%	200	0.7	<0.25	<0.25	<0.25	0.4	0.8	1.8	14	43	0.8
ACETONE	7	6.1%	114	16	<0.25	3.4	6.4	14	44	58	170	200	30
ALPHA-PINENE	122	61.0%	200	0.9	<0.25	<0.25	<0.25	0.5	2	3.8	12	18	1.2
BENZENE	18	9.0%	200	1.9	<0.25	0.6	1.3	2.2	4.3	5.8	13	17	4.8
BROMOMETHANE	162	81.0%	200	0.4	<0.25	<0.25	<0.25	<0.25	0.5	0.9	3.1	27	0.5
CARBON TETRACHLORIDE	108	54.0%	200	0.4	<0.25	<0.25	<0.25	0.6	0.8	1	3.3	3.6	1.2
CHLOROBENZENE	200	100.0%	200	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NC
CHLOROETHANE	188	94.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	0.4	0.7	1.4	0.4
CHLOROFORM	168	84.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	0.4	0.5	0.8	1.3	0.5
CHLOROMETHANE	96	48.0%	200	1.3	<0.25	<0.25	0.5	1.8	3.2	4.6	7.6	13	4.3
CIS-1,2-DICHLOROETHENE	193	96.5%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	1.8	2.7	0.4
CIS-1,3-DICHLOROPROPENE	195	97.5%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	2.4	3.3	0.4
CYCLOHEPTANE	148	74.0%	200	0.4	<0.25	<0.25	<0.25	0.3	0.7	1.1	4.8	12	0.6
CYCLOHEXANE	137	68.5%	200	1.5	<0.25	<0.25	<0.25	0.4	1.3	3	16	170	0.9
DICHLORODIFLUOROMETHANE	108	54.0%	200	2.8	<0.25	<0.25	<0.25	4.2	7.5	11	23	38	10
d-LIMONENE	155	77.9%	199	1	<0.25	<0.25	<0.25	<0.25	0.8	1.5	24	83	0.5
ETHYL ALCOHOL	1	0.9%	114	35	<0.25	3.3	6.9	16	31	220	610	930	34
ETHYLBENZENE	107	53.5%	200	0.8	<0.25	<0.25	<0.25	0.5	1.1	1.9	19	21	1.0
ETHYLCYCLOHEXANE	164	82.0%	200	0.4	<0.25	<0.25	<0.25	<0.25	0.5	1	5.7	14	0.5

(Continued)

Table C1. NYSDOH 2003: Study of volatile organic chemicals in air of fuel oil heated homes -- Continued

All results are micrograms per cubic meter (mcg/m^3).

Compound	OUTDOOR AIR												
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max	Upper F
ETHYLMETHACRYLATE	114	100.0%	114	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NC
HEXACHLORO-1,3-BUTADIENE	162	81.0%	200	1.2	<0.25	<0.25	<0.25	<0.25	2.3	7	20	27	0.5
ISO-OCTANE	139	69.5%	200	0.5	<0.25	<0.25	<0.25	0.3	0.9	2	7.5	11	0.7
ISOPRENE	111	55.5%	200	1.1	<0.25	<0.25	<0.25	0.9	2.8	4.6	13	21	2.0
ISOPROPYLBENZENE	182	91.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	0.4	0.7	0.9	0.4
M,P-XYLENE	110	55.0%	200	0.8	<0.25	<0.25	<0.25	0.5	1.4	3.1	17	20	1.0
METHYL ETHYL KETONE	8	7.0%	114	6.2	<0.25	0.8	1.3	2.6	6.3	17	180	210	5.3
METHYL ISOBUTYL KETONE	86	75.4%	114	0.8	<0.25	<0.25	<0.25	<0.25	0.9	2.9	21	24	0.5
METHYLCYCLOHEXANE	141	70.5%	200	0.5	<0.25	<0.25	<0.25	0.3	0.8	1.6	4.7	23	0.7
METHYLENE CHLORIDE	101	50.5%	200	0.8	<0.25	<0.25	<0.25	0.7	1.6	2.9	12	23	1.6
METHYLMETHACRYLATE	110	96.5%	114	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	1.5	2.4	0.4
n-BUTYLBENZENE	53	46.5%	114	1	<0.25	<0.25	0.3	0.9	2.1	5.9	10	14	1.9
n-DECANE	174	87.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	0.3	0.4	1.2	8.8	0.4
n-DODECANE	65	32.5%	200	1.3	<0.25	<0.25	0.8	2	2.6	3.6	8.5	20	4.7
n-HEPTANE	94	47.0%	200	2.2	<0.25	<0.25	0.5	1.9	4.5	7.6	27	89	4.5
n-HEXANE	57	28.5%	200	1.5	<0.25	<0.25	0.5	1	2.6	5.1	20	67	2.2
n-NONANE	79	39.5%	200	1.1	<0.25	<0.25	0.4	0.9	1.6	3.6	19	26	2.0
n-OCTANE	131	65.5%	200	0.4	<0.25	<0.25	<0.25	0.4	0.8	1.2	5.1	13	0.7
n-PROPYLBENZENE	112	56.0%	200	1	<0.25	<0.25	<0.25	0.7	1.2	2.1	8.6	90	1.5
n-UNDECANE	184	92.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	0.5	2	8	0.4
O-XYLENE	105	52.5%	200	0.6	<0.25	<0.25	<0.25	0.7	1.7	2.3	5.8	6.8	1.5
O-XYLENE	120	60.0%	200	0.7	<0.25	<0.25	<0.25	0.6	1.7	2.5	8.9	10	1.2
sec-BUTYLBENZENE	160	80.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	0.4	0.5	1.2	3.8	0.5
STYRENE	158	79.0%	200	0.2	<0.25	<0.25	<0.25	<0.25	0.4	0.6	2.3	3.6	0.5
tert-BUTYLBENZENE	177	88.5%	200	0.4	<0.25	<0.25	<0.25	<0.25	0.3	0.6	2.9	31	0.4
TETRACHLOROETHENE	143	71.5%	200	0.6	<0.25	<0.25	<0.25	0.3	0.8	1.6	12	20	0.7
TETRAHYDROFURAN	108	94.7%	114	0.3	<0.25	<0.25	<0.25	<0.25	<0.25	0.4	4	8.5	0.4
TOLUENE	12	6.0%	200	11	<0.25	0.6	1.3	2.4	5.9	21	350	640	5.1
TRANS-1,3-DICHLOROPROPENE	200	100.0%	200	0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NC
TRICHLOROETHENE	177	88.5%	200	0.2	<0.25	<0.25	<0.25	<0.25	0.3	0.5	1	1.3	0.4
TRICHLOROFLUOROMETHANE	70	35.0%	200	1.7	<0.25	<0.25	0.8	2.2	3.6	6.1	17	20	5.1
VINYL CHLORIDE	197	98.5%	200	0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.4	4.8	0.4

ND = Number of non-detects

ND (%) = Percentage of total number in sample that are non-detect

N = Total number of samples

* Non-detects were estimated at 1/2 the detection limit to calculate the mean

Min; Max = minimum and maximum value detected

Upper F = Upper Fence = The upper fence is calculated as 1.5 times the interquartile range (difference between the 25th and 75th percentile values) above the 75th percentile value.

NC = Upper Fence not calculated. Compound not detected in any sample.

Table C2. EPA 2001: Building assessment and survey evaluation (BASE) database, SUMMA® canister method

All results are micrograms per cubic meter (mcg/m^3).

Compound	**INDOOR AIR**											
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max
1,1,1-TRICHLOROETHANE	7	2.3%	298	16.2	<0.5	2.6	5.1	10.8	20.6	33.0	737.9	833.2
1,1,2-TRICHLOROETHANE	136	100.0%	136	0.6	<0.6	<1.0	<1.3	<1.4	<1.5	<1.6	<2.1	<2.3
1,1-DICHLOROETHANE	136	100.0%	136	0.2	<0.2	<0.4	<0.5	<0.5	<0.7	<0.8	<0.9	<0.9
1,1-DICHLOROETHENE	136	100.0%	136	0.5	<0.7	<0.9	<1.1	<1.2	<1.4	<1.6	<1.7	<1.8
1,2,4-TRICHLOROBENZENE	136	100.0%	136	1.1	<0.6	<0.9	<1.0	<1.2	<6.8	<7.2	<8.1	<8.2
1,2,4-TRIMETHYLBENZENE	52	17.7%	294	4.8	<0.4	1.7	2.8	5.1	9.5	13.7	39.0	91.0
1,2-DIBROMOETHANE	258	99.6%	259	0.6	<0.8	<1.1	<1.3	<1.4	<1.5	<1.6	<2.7	1.4
1,2-DICHLOROBENZENE	255	98.5%	259	0.6	<0.6	<0.8	<0.9	<1.0	<1.2	<1.3	10.5	11.2
1,2-DICHLOROETHANE	254	98.1%	259	0.9	<0.4	<0.5	<0.6	<0.7	<0.9	<1.0	24.8	84.9
1,2-DICHLOROPROPANE	136	100.0%	136	0.6	<0.5	<1.0	<1.4	<1.6	<1.6	<1.7	<2.3	<2.6
1,3,5-TRIMETHYLBENZENE	206	79.5%	259	1.6	<0.8	<1.3	<1.5	<4.6	3.7	4.6	9.0	16.6
1,3-BUTADIENE	39	100.0%	39	1.4	<2.1	<2.3	<2.5	<2.7	<3.0	<7.5	<7.9	<7.9
1,3-DICHLOROBENZENE	136	100.0%	136	0.6	<0.5	<0.7	<0.8	<1.1	<2.4	<2.5	<2.8	<2.9
1,4-DICHLOROBENZENE	212	71.1%	298	3.1	<0.5	<0.8	<1.2	1.4	5.5	12.5	80.5	87.1
1-BUTANOL	118	95.9%	123	42.7	<2.4	<3.6	<4.0	<4.3	<4.8	<7.9	35.3	4957.4
2-BUTANONE (MEK)	13	5.0%	259	6.2	<1.4	3.3	5.2	7.5	12.0	13.5	28.1	55.4
2-BUTOXYETHANOL	123	100.0%	123	4.0	<4.8	<7.2	<8.0	<8.6	<9.3	<10.4	<16.4	<16.8
2-ETHYL-1-HEXANOL	160	98.8%	162	3.2	<1.1	<5.0	<7.6	<8.4	<9.2	<9.7	8.2	8.4
2-METHYL-1-PROPANOL	30	76.9%	39	1.2	<0.9	<1.0	<1.1	<3.0	3.1	5.5	5.8	5.8
2-PROPANOL	8	20.5%	39	73.1	<1.3	6.6	30.0	56.0	250.0	475.0	580.0	580.0
3-METHYL PENTANE	125	48.3%	259	3.1	<0.9	<1.7	1.4	4.2	6.5	8.3	22.9	35.4
4-ETHYLTOLUENE	212	81.9%	259	1.7	<0.9	<1.5	<1.6	<3.1	3.6	5.9	9.8	16.4
4-METHYL-2-PENTANONE	153	59.1%	259	3.1	<0.7	<1.2	<1.5	3.0	6.0	8.1	58.4	72.5
ACETONE	0	0.0%	259	54.0	11.6	32.4	45.0	59.8	98.9	120.2	226.6	243.7
a-PINENE	238	79.9%	298	4.2	<0.5	<1.1	<1.2	<2.8	3.6	6.4	67.8	399.1
BENZENE	56	19.0%	294	4.5	<0.8	2.1	3.4	5.1	9.4	12.5	25.0	63.0
BENZYL CHLORIDE	136	100.0%	136	1.2	<0.8	<1.2	<1.4	<1.7	<6.8	<7.2	<8.1	<8.2
BROMOMETHANE	246	95.0%	259	0.6	<0.6	<0.8	<0.9	<1.1	<1.7	<2.1	3.6	4.6
BUTYL ACETATE	232	77.9%	298	2.9	<0.9	<1.5	<1.8	<5.2	4.5	15.8	35.3	50.6
CARBON DISULFIDE	134	51.7%	259	1.9	<0.5	<0.8	<1.3	2.1	4.2	6.4	14.8	24.5
CARBON TETRACHLORIDE	241	93.1%	259	0.5	<0.5	<0.8	<0.9	<1.1	<1.3	0.7	0.9	2.1
CHLOROBENZENE	255	98.5%	259	0.4	<0.4	<0.6	<0.7	<0.8	<0.9	<1.0	1.0	1.2
CHLOROETHANE	254	98.1%	259	1.1	<0.6	<0.8	<0.9	<1.0	<1.1	<1.3	47.9	56.7
CHLOROFORM	203	78.4%	259	0.5	<0.3	<0.4	<0.5	<1.2	1.1	1.4	4.8	12.1
CHLOROMETHANE	2	0.8%	259	2.9	<0.7	2.1	2.5	3.1	3.7	4.4	12.3	21.8
CIS-1,2-DICHLOROETHENE	136	100.0%	136	0.6	<0.6	<0.8	<1.0	<1.2	<1.9	<2.0	<2.2	<2.3

(Continued)

Table C2. EPA 2001: Building assessment and survey evaluation (BASE) database, SUMMA® canister method -- Continued

All results are micrograms per cubic meter (mcg/m³).

Compound	INDOOR AIR											
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max
CIS-1,3-DICHLOROPROPENE	136	100.0%	136	0.9	<1.2	<1.7	<1.9	<2.0	<2.3	<2.5	<2.9	<3.2
DICHLORODIFLUOROMETHANE	18	6.9%	259	13.8	<4.8	4.8	6.7	10.5	16.5	32.9	81.3	942.3
DICHLOROTETRAFLUOROETHANE	136	100.0%	136	1.6	<1.5	<2.2	<2.5	<3.0	<6.8	<7.4	<8.2	<11.3
DIMETHYL DISULFIDE	239	92.3%	259	2.0	<1.4	<2.1	<2.4	<2.7	<3.7	3.6	32.4	70.4
d-LIMONENE	74	24.8%	298	10.8	<0.7	2.5	5.3	11.3	22.5	43.7	136.7	148.0
DODECANE	107	35.9%	298	8.2	<1.7	<4.5	5.4	9.6	15.9	22.0	92.8	110.0
ETHANOL	3	7.7%	39	89.3	<1.2	26.0	79.0	140.0	210.0	290.0	300.0	300.0
ETHYL ACETATE	163	54.7%	298	3.0	<0.6	<1.0	<2.6	3.2	5.4	9.5	59.0	64.2
ETHYLBENZENE	144	49.0%	294	2.8	<0.9	<1.6	1.4	3.4	5.7	7.6	18.5	73.6
HEXACHLOROBUTADIENE	136	100.0%	136	1.5	<1.3	<1.8	<2.1	<2.5	<6.8	<7.2	<8.1	<8.2
HEXANAL	78	63.4%	123	6.8	<2.5	<3.9	<4.6	7.8	12.0	14.7	26.2	235.1
m & p-XYLENES	53	18.0%	294	10.8	<1.5	4.1	6.9	12.2	22.2	28.5	67.6	260.8
METHYL TERTIARY-BUTYL ETHER	198	76.4%	259	3.3	<1.0	<1.5	<1.7	<6.4	11.5	16.1	30.8	34.0
METHYLENE CHLORIDE	94	31.5%	298	21.2	<1.1	<1.7	2.9	5.0	10.0	16.0	1155.6	1496.9
NAPHTHALENE	254	85.8%	296	6.6	<1.4	<2.2	<2.5	<5.2	5.1	20.9	98.0	410.0
n-DECANE	58	19.5%	298	7.4	<0.7	3.0	4.6	8.4	17.5	22.4	48.6	54.8
n-HEPTANAL	36	92.3%	39	1.7	<1.2	<1.3	<1.5	<1.6	<3.6	3.1	34.9	34.9
n-HEXANE	26	16.0%	162	6.3	<.9	1.6	3.1	6.4	10.2	15.2	120.0	130.0
NONANAL	146	90.1%	162	6.8	<1.6	<5.1	<7.8	<8.6	<16.8	30.2	88.9	106.3
NONANE	101	39.0%	259	3.7	<0.5	<1.0	1.7	3.6	7.8	12.4	45.2	53.8
n-UNDECANE	25	9.7%	259	12.6	<1.1	5.1	8.9	16.4	22.6	27.4	68.7	169.6
OCTANE	155	52.0%	298	5.5	<0.4	<0.8	<2.5	2.0	4.5	8.6	47.9	921.7
o-XYLENE	81	27.6%	294	3.8	<0.7	<2.4	2.4	4.4	7.9	11.2	20.1	90.5
PENTANAL	111	90.2%	123	3.0	<2.4	<3.7	<4.1	<4.6	<7.3	7.0	20.0	57.3
STYRENE	251	85.4%	294	1.5	<0.6	<1.6	<1.8	<2.3	1.9	4.3	15.0	40.0
TETRACHLOROETHENE	103	34.6%	298	6.0	<0.9	<1.9	3.0	5.9	15.9	25.4	55.6	65.7
TOLUENE	0	0.0%	294	25.1	3.5	10.7	15.7	25.9	43.0	70.8	348.9	390.3
TRANS-1,3-DICHLOROPROPENE	136	100.0%	136	0.5	<0.5	<0.8	<1.1	<1.2	<1.3	<1.3	<1.8	<2.0
TRICHLOROETHENE	216	72.5%	298	2.6	<0.6	<1.2	<1.4	1.2	4.2	6.5	57.0	88.5
TRICHLOROFLUOROMETHANE	107	35.9%	298	19.4	<1.7	<3.7	3.9	6.7	18.1	54.0	860.6	1015.3
TRICHLOROTRIFLUOROETHANE	217	83.8%	259	2.0	<1.1	<1.7	<1.9	<3.0	3.5	9.4	19.7	30.9
VINYL CHLORIDE	257	99.2%	259	0.5	<0.6	<0.8	<0.9	<1.0	<1.9	<2.2	<2.6	7.5

(Continued)

Table C2. EPA 2001: Building assessment and survey evaluation (BASE) database, SUMMA® canister method -- Continued

All results are micrograms per cubic meter (mcg/m^3).

Compound	OUTDOOR AIR											
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max
1,1,1-TRICHLOROETHANE	40	40.0%	100	1.3	<0.4	<0.6	0.8	1.7	2.6	3.8	8.4	8.7
1,1,2-TRICHLOROETHANE	46	100.0%	46	0.6	<0.6	<1.0	<1.2	<1.4	<1.6	<1.6	<1.8	<1.8
1,1-DICHLOROETHANE	46	100.0%	46	0.2	<0.4	<0.4	<0.4	<0.6	<0.6	<0.8	<0.8	<0.8
1,1-DICHLOROETHENE	46	100.0%	46	0.5	<0.8	<1.0	<1.0	<1.2	<1.4	<1.4	<1.6	<1.6
1,2,4-TRICHLOROBENZENE	46	100.0%	46	1.1	<0.6	<0.8	<1.0	<1.2	<6.4	<6.6	<7.8	<7.8
1,2,4-TRIMETHYLBENZENE	30	30.0%	100	2.6	<0.4	<1.6	1.8	3.1	5.8	7.1	19.1	24.2
1,2-DIBROMOETHANE	87	100.0%	87	0.6	<0.8	<1.2	<1.2	<1.4	<1.6	<1.6	<2.0	<2.0
1,2-DICHLOROBENZENE	86	98.9%	87	0.4	<0.6	<0.8	<1.0	<1.0	<1.2	<1.2	1.1	1.1
1,2-DICHLOROETHANE	86	98.9%	87	0.3	<0.4	<0.6	<0.6	<0.6	<0.8	<1.0	0.8	0.8
1,2-DICHLOROPROPANE	46	100.0%	46	0.6	<0.6	<1.2	<1.4	<1.6	<1.6	<1.8	<1.8	<1.8
1,3,5-TRIMETHYLBENZENE	69	79.3%	87	1.2	<0.8	<1.2	<1.4	<2.4	2.7	3.3	8.9	8.9
1,3-BUTADIENE	13	100.0%	13	1.5	<2.2	<2.4	<2.6	<2.8	<3.4	<7.6	<7.6	<7.6
1,3-DICHLOROBENZENE	46	100.0%	46	0.5	<0.6	<0.8	<0.8	<1.0	<2.2	<2.4	<2.8	<2.8
1,4-DICHLOROBENZENE	88	88.0%	100	0.7	<0.6	<0.8	<0.8	<1.4	1.2	1.7	5.4	6.1
1-BUTANOL	41	100.0%	41	2.0	<2.4	<3.4	<4.0	<4.4	<4.8	<5.2	<6.0	<6.0
2-BUTANONE (MEK)	5	5.7%	87	5.2	<1.2	2.2	3.7	5.7	11.3	14.8	43.1	43.1
2-BUTOXYETHANOL	41	100.0%	41	3.9	<4.6	<7.0	<8.0	<8.6	<9.6	<10.4	<11.8	<11.8
2-ETHYL-1-HEXANOL	53	98.1%	54	3.2	<1.2	<4.6	<7.2	<8.4	<9.6	<10.8	5.9	5.9
2-METHYL-1-PROPANOL	13	100.0%	13	0.6	<0.8	<1.0	<1.0	<1.2	<1.4	<3.0	<3.0	<3.0
2-PROPANOL	4	30.8%	13	6.4	<3.0	<4.2	4.7	6.6	16.5	23.5	23.5	23.5
3-METHYL PENTANE	55	63.2%	87	1.8	<1.0	<1.4	<1.6	2.0	4.4	6.6	10.5	10.5
4-ETHYLTOLUENE	75	86.2%	87	1.2	<1.0	<1.4	<1.6	<2.0	3.0	3.3	8.0	8.0
4-METHYL-2-PENTANONE	61	70.1%	87	1.3	<0.8	<1.0	<1.2	0.9	1.9	4.3	21.0	21.0
ACETONE	1	1.1%	87	26.5	<1.8	15.4	22.5	31.7	43.7	56.0	104.2	104.2
a-PINENE	92	92.0%	100	1.0	<0.6	<1.0	<1.2	<1.4	<6.2	3.7	6.8	8.1
BENZENE	22	22.0%	100	3.2	<1.2	1.2	2.7	3.7	6.6	9.6	12.6	13.0
BENZYL CHLORIDE	46	100.0%	46	1.2	<1.0	<1.2	<1.4	<1.6	<6.4	<6.6	<7.8	<7.8
BROMOMETHANE	82	94.3%	87	0.6	<0.6	<0.8	<1.0	<1.0	<1.6	1.0	4.5	4.5
BUTYL ACETATE	94	94.0%	100	1.4	<0.8	<1.4	<1.6	<1.8	<5.8	3.3	18.6	32.7
CARBON DISULFIDE	39	44.8%	87	2.1	<0.6	<0.8	0.9	2.2	3.7	8.3	22.0	22.0
CARBON TETRACHLORIDE	69	79.3%	87	0.5	<0.6	<0.8	<1.0	<1.0	0.7	0.7	1.5	1.5
CHLOROBENZENE	85	97.7%	87	0.4	<0.4	<0.6	<0.8	<0.8	<0.8	<1.0	1.1	1.1
CHLOROETHANE	84	96.6%	87	0.5	<0.6	<0.8	<0.9	<1.0	<1.2	<1.2	3.5	3.5
CHLOROFORM	77	88.5%	87	0.5	<0.2	<0.4	<0.4	<0.6	0.6	0.7	13.8	13.8
CHLOROMETHANE	0	0.0%	87	2.6	0.9	2.0	2.3	3.0	3.7	4.0	10.6	10.6
CIS-1,2-DICHLOROETHENE	45	97.8%	46	0.5	<0.6	<0.8	<1.0	<1.2	<1.8	<1.8	1.1	1.1

(Continued)

Table C2. EPA 2001: Building assessment and survey evaluation (BASE) database, SUMMA® canister method -- Continued

All results are micrograms per cubic meter (mcg/m^3).

Compound	OUTDOOR AIR											
	ND	ND(%)	N	Mean*	Min	25th	Median	75th	90th	95th	99th	Max
CIS-1,3-DICHLOROPROPENE	46	100.0%	46	0.9	<1.4	<1.6	<1.8	<2.0	<2.2	<2.4	<2.6	<2.6
DICHLORODIFLUOROMETHANE	7	8.0%	87	7.3	<4.4	3.8	4.4	5.8	8.1	12.2	183.7	183.7
DICHLOROTETRAFLUOROETHANE	46	100.0%	46	1.6	<1.6	<2.2	<2.4	<3.0	<6.4	<6.6	<7.8	<7.8
DIMETHYL DISULFIDE	74	85.1%	87	1.7	<1.4	<2.0	<2.4	<2.8	2.4	4.5	16.4	16.4
d-LIMONENE	73	73.0%	100	1.5	<0.8	<1.0	<1.4	2.0	3.6	4.1	9.8	12.5
DODECANE	51	51.0%	100	4.6	<2.0	<2.6	<4.0	4.2	10.4	14.1	51.0	52.3
ETHANOL	0	0.0%	13	32.0	3.8	13.0	24.5	47.0	57.0	82.5	82.5	82.5
ETHYL ACETATE	89	89.0%	100	0.7	<0.6	<0.8	<1.0	<1.2	1.5	1.9	3.7	3.9
ETHYLBENZENE	59	59.0%	100	1.4	<0.8	<1.4	<1.8	1.6	3.5	4.3	7.6	7.8
HEXACHLOROBUTADIENE	46	100.0%	46	1.4	<1.4	<1.8	<2.0	<2.6	<6.4	<6.6	<7.8	<7.8
HEXANAL	30	73.2%	41	3.1	<2.4	<3.8	<4.2	2.7	3.3	3.8	36.0	36.0
m & p-XYLENES	26	26.0%	100	5.6	<1.4	<3.6	4.4	7.3	12.8	16.1	24.8	26.8
METHYL TERTIARY-BUTYL ETHER	67	77.0%	87	2.7	<1.0	<1.4	<1.8	<5.4	6.2	13.3	36.0	36.0
METHYLENE CHLORIDE	43	43.0%	100	3.7	<1.0	<1.8	1.3	3.0	6.1	10.3	63.0	78.5
NAPHTHALENE	86	86.0%	100	10.6	<1.4	<2.0	<2.4	<4.8	4.9	15.1	379.8	670.0
n-DECANE	35	35.0%	100	3.7	<0.6	<2.0	2.4	4.2	7.6	11.4	32.4	37.3
n-HEPTANAL	10	76.9%	13	3.0	<1.2	<1.5	<1.8	<2.2	2.2	26.8	26.8	26.8
n-HEXANE	16	29.6%	54	2.5	<.8	<1.2	1.4	2.7	6.4	11.4	15.3	15.3
NONANAL	41	75.9%	54	8.6	<1.6	<6.0	<7.8	<10.8	22.7	37.6	57.0	57.0
NONANE	49	56.3%	87	1.3	<0.4	<0.8	<1.0	1.7	2.8	4.0	15.3	15.3
n-UNDECANE	13	14.9%	87	7.0	<1.0	2.6	3.9	7.8	14.8	19.7	94.8	94.8
OCTANE	73	73.0%	100	0.9	<0.4	<0.6	<0.8	1.0	1.6	1.9	11.9	17.5
o-XYLENE	36	36.0%	100	2.0	<0.6	<1.4	1.4	2.6	4.6	6.0	9.6	11.1
PENTANAL	37	90.2%	41	3.5	<2.4	<3.4	<4.0	<4.4	<6.0	7.0	52.7	52.7
STYRENE	83	83.0%	100	1.7	<0.6	<1.4	<1.6	<2.0	1.3	3.6	34.1	58.0
TETRACHLOROETHENE	51	51.0%	100	2.7	<0.8	<1.4	<2.0	3.0	6.5	10.4	24.8	27.6
TOLUENE	0	0.0%	100	15.4	2.1	5.9	9.6	16.3	33.7	49.2	86.5	93.1
TRANS-1,3-DICHLOROPROPENE	46	100.0%	46	0.5	<0.6	<0.8	<1.0	<1.2	<1.4	<1.4	<1.4	<1.4
TRICHLOROETHENE	81	81.0%	100	1.0	<0.6	<1.0	<1.5	<1.6	1.3	2.6	11.2	13.5
TRICHLOROFLUOROMETHANE	41	41.0%	100	3.6	<2.0	<2.8	1.7	2.8	4.3	5.6	71.1	132.5
TRICHLOROTRIFLUOROETHANE	75	86.2%	87	1.0	<1.2	<1.6	<1.8	<2.0	1.6	1.8	5.4	5.4
VINYL CHLORIDE	87	100.0%	87	0.5	<0.6	<0.8	<1.0	<1.0	<1.8	<2.0	<2.6	<2.6

ND = Number of non-detects

ND (%) = Percentage of total number in sample that are non-detect

N = Total number of samples

* Non-detects were estimated at 1/2 the appropriate detection limit or quantification limit to calculate the mean

Min; Max = minimum and maximum value detected