



529 **Supplemental Materials**

530 Supplemental Table 1. Variance components of indoor VOC concentrations, partitioned using the original  
 531 data and the data with replicate measurements averaged.  $\sigma^2_C$  = between-city variation;  $\sigma^2_R$  = between-  
 532 residence variation;  $\sigma^2_S$  = seasonal variation;  $\sigma^2_E$  = measurement uncertainty.

VOCs	Original Data (n=481)				Replicates Averaged (n=244)		
	$\sigma^2_C$ (%)	$\sigma^2_R$ (%)	$\sigma^2_S$ (%)	$\sigma^2_E$ (%)	$\sigma^2_C$ (%)	$\sigma^2_R$ (%)	$\sigma^2_S$ (%)
<b>Aromatic compounds</b>							
Benzene	0.0	30.3	67.6	2.1	0.0	33.3	66.7
Toluene	4.2	53.2	41.5	1.1	4.3	54.0	41.7
Ethylbenzene	2.9	38.0	57.6	1.5	3.1	39.3	57.6
p,m-Xylene	2.2	45.0	51.6	1.3	2.3	46.1	51.6
o-Xylene	3.3	44.1	51.0	1.7	3.4	45.3	51.2
Styrene	8.4	21.4	64.5	5.6	9.1	22.5	68.5
1,2,4-Trimethylbenzene	7.9	45.5	44.9	1.7	8.2	46.5	45.2
1,3,5-Trimethylbenzene	8.4	40.2	47.2	4.2	8.7	41.9	49.4
1,2,3-Trimethylbenzene	9.6	36.4	50.0	4.0	10.0	37.8	52.2
4-Ethyl toluene	10.0	33.5	54.1	2.5	10.5	34.3	55.2
2-Ethyl toluene	9.0	37.9	50.3	2.8	9.3	39.2	51.5
Isopropylbenzene	6.0	35.8	45.7	12.5	6.4	39.0	54.6
n-Propylbenzene	6.1	40.5	48.0	5.4	6.6	42.1	51.3
p-Isopropyltoluene	22.2	14.6	56.8	6.4	23.2	15.4	61.4
n-Butylbenzene	10.1	27.5	40.4	22.0	11.3	31.5	57.1
Naphthalene	0.0	61.7	25.0	13.3	0.0	66.6	33.4
<b>Chlorinated compounds</b>							
Chloroform	38.2	17.0	24.6	20.2	43.0	18.9	38.2
Tetrachloroethene	13.4	36.5	27.8	22.2	15.3	41.2	43.5
Carbon tetrachloride	3.0	0.0	58.9	38.1	4.0	0.0	96.0
1,4-Dichlorobenzene	9.2	53.1	27.3	10.4	9.8	55.8	34.4
<b>Aliphatic compounds</b>							
Methyl cyclohexane	12.8	28.3	46.6	12.3	14.1	29.8	56.1
n-Nonane	3.5	6.5	63.6	26.4	3.9	7.4	88.7
n-Decane	4.5	7.7	75.5	12.3	5.1	8.3	86.6
n-Undecane	2.8	15.9	69.1	12.2	3.3	17.4	79.3
n-Dodecane	5.3	25.0	53.1	16.6	6.2	27.8	66.0
n-Tridecane	14.4	28.3	42.6	14.6	15.9	31.0	53.1
n-Tetradecane	10.5	34.4	42.1	13.0	11.3	37.0	51.7
n-Pentadecane	6.9	22.9	55.5	14.7	7.5	25.0	67.4
n-Hexadecane	4.5	21.6	50.7	23.2	5.3	25.0	69.6
n-Heptadecane	4.2	13.0	54.7	28.1	5.1	16.0	78.9
<b>Terpenoid compounds</b>							
$\alpha$ -Pinene	2.1	51.0	45.5	1.4	2.0	51.5	46.5
d-Limonene	11.1	19.6	66.5	2.8	11.5	19.9	68.6
<b>TVOC</b>	8.1	35.4	54.4	2.1	8.5	36.2	55.2

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535 Supplemental Table 2. Variance components of outdoor VOC concentrations, partitioned using the  
 536 original data and the data with replicate measurements averaged.  $\sigma^2_C$  = between-city variation;  $\sigma^2_R$  =  
 537 between-residence variation;  $\sigma^2_S$  = seasonal variation;  $\sigma^2_E$  = measurement uncertainty.

VOCs	Original Data (n=437)				Replicates Averaged (n=228)		
	$\sigma^2_C$ (%)	$\sigma^2_R$ (%)	$\sigma^2_S$ (%)	$\sigma^2_E$ (%)	$\sigma^2_C$ (%)	$\sigma^2_R$ (%)	$\sigma^2_S$ (%)
<b>Aromatic compounds</b>							
Benzene	10.9	0.0	82.2	6.9	11.2	0.0	88.8
Toluene	37.6	0.0	56.0	6.4	39.3	0.0	60.7
Ethylbenzene	38.3	0.0	55.3	6.4	40.2	0.1	59.7
p,m-Xylene	41.5	1.0	51.6	5.9	43.2	1.5	55.3
o-Xylene	41.3	0.0	49.9	8.8	43.5	0.6	55.9
Styrene	19.2	0.0	53.6	27.2	22.3	0.0	77.7
1,2,4-Trimethylbenzene	44.4	0.0	45.8	9.8	47.0	0.0	53.0
1,3,5-Trimethylbenzene	45.1	3.4	37.8	13.7	48.5	4.2	47.3
1,2,3-Trimethylbenzene	45.4	0.0	35.3	19.2	50.2	0.0	49.8
4-Ethyl toluene	35.0	0.6	45.7	18.7	38.6	2.0	59.4
2-Ethyl toluene	42.6	0.0	42.3	15.1	46.2	0.1	53.6
Isopropylbenzene	35.2	0.6	27.4	36.8	42.9	0.3	56.8
n-Propylbenzene	44.1	1.4	31.5	22.9	50.0	1.5	48.5
p-Isopropyltoluene	31.9	0.0	50.5	17.6	34.9	0.0	65.1
Naphthalene	5.6	0.0	49.6	44.9	6.6	0.0	93.4
<b>Chlorinated compounds</b>							
Tetrachloroethene	28.8	5.3	6.0	59.9	41.4	7.7	50.9
Carbon tetrachloride	2.9	0.0	58.6	38.5	3.4	0.0	96.6
1,4-Dichlorobenzene	17.4	13.6	14.4	54.6	23.6	20.6	55.8
<b>Aliphatic compounds</b>							
Methyl cyclohexane	25.8	0.0	29.2	45.1	33.6	0.0	66.4
n-Nonane	11.4	0.0	45.3	43.3	14.9	0.0	85.1
n-Decane	20.4	1.5	39.8	38.3	25.6	0.5	73.9
<b>Terpenoid compounds</b>							
$\alpha$ -Pinene	0.0	0.0	64.5	35.5	0.0	0.0	100.0
d-Limonene	32.8	0.0	11.8	55.4	45.3	0.0	54.7
<b>TVOC</b>	<b>37.7</b>	<b>0.8</b>	<b>56.0</b>	<b>5.5</b>	<b>38.9</b>	<b>1.3</b>	<b>59.7</b>

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540 Supplemental Table 3. Factor patterns of indoor VOC concentrations. Factor loadings >0.5 are  
 541 highlighted.

VOCs	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7
Benzene	<b>0.63</b>	-0.06	-0.06	0.11	0.00	-0.07	<b>0.61</b>
Toluene	<b>0.77</b>	0.26	0.01	0.25	-0.04	-0.02	0.17
Ethylbenzene	<b>0.89</b>	0.13	0.06	0.19	0.02	0.08	0.12
p,m-Xylene	<b>0.93</b>	0.08	0.06	0.13	0.02	0.04	0.12
o-Xylene	<b>0.94</b>	0.09	0.09	0.14	0.03	0.04	0.10
Styrene	0.30	0.27	0.16	<b>0.68</b>	0.04	0.16	0.07
1,2,4-Trimethylbenzene	<b>0.92</b>	0.07	0.27	0.11	0.10	-0.01	0.02
1,3,5-Trimethylbenzene	<b>0.91</b>	0.08	0.28	0.08	0.07	0.01	-0.01
1,2,3-Trimethylbenzene	<b>0.83</b>	0.08	0.37	0.16	0.15	0.03	0.02
4-Ethyl toluene	<b>0.76</b>	0.12	0.11	0.09	0.12	0.17	0.00
2-Ethyl toluene	<b>0.91</b>	0.06	0.30	0.11	0.11	0.00	0.01
Isopropylbenzene	<b>0.79</b>	0.12	0.33	0.17	0.09	0.05	-0.12
n-Propylbenzene	<b>0.91</b>	0.09	0.27	0.14	0.07	0.03	0.02
p-Isopropyltoluene	0.25	0.30	0.20	<b>0.68</b>	0.31	0.06	0.06
n-Butylbenzene	<b>0.71</b>	0.09	0.41	0.17	0.15	0.14	0.03
Naphthalene	0.25	0.33	0.14	0.13	-0.29	<b>0.62</b>	0.12
Chloroform	0.05	0.19	0.17	0.24	<b>0.61</b>	0.36	0.12
Tetrachloroethene	0.26	0.18	0.02	0.10	<b>0.64</b>	-0.01	0.06
Carbon tetrachloride	0.06	-0.02	0.13	0.05	0.13	0.06	<b>0.91</b>
1,4-Dichlorobenzene	0.01	0.13	-0.04	0.10	0.25	<b>0.82</b>	-0.04
Methyl cyclohexane	<b>0.54</b>	0.18	0.24	0.15	0.39	-0.12	0.12
n-Nonane	0.39	0.11	<b>0.75</b>	0.01	0.12	0.03	0.00
n-Decane	0.36	0.11	<b>0.84</b>	0.15	0.08	0.06	0.02
n-Undecane	0.32	0.17	<b>0.83</b>	0.16	-0.01	0.01	0.08
n-Dodecane	0.28	0.43	<b>0.60</b>	0.29	0.06	-0.02	0.14
n-Tridecane	0.21	<b>0.69</b>	0.20	0.21	0.15	-0.11	-0.02
n-Tetradecane	0.11	<b>0.90</b>	0.09	0.21	0.10	0.06	0.00
n-Pentadecane	0.08	<b>0.93</b>	0.09	0.17	0.09	0.12	0.00
n-Hexadecane	0.08	<b>0.90</b>	0.11	0.13	0.08	0.15	-0.01
n-Heptadecane	0.07	<b>0.87</b>	0.07	0.14	0.05	0.17	-0.02
$\alpha$ -Pinene	0.33	0.24	0.03	<b>0.73</b>	-0.09	0.05	-0.03
d-Limonene	0.14	0.25	0.18	<b>0.76</b>	0.28	0.07	0.07

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545 Supplemental Table 4. Factor patterns of outdoor VOC concentrations. Factor loadings >0.5 are  
 546 highlighted.

VOCs	Factor1	Factor2	Factor3	Factor4
Benzene	0.48	0.23	0.04	<b>0.71</b>
Toluene	<b>0.87</b>	0.24	0.22	0.21
Ethylbenzene	<b>0.88</b>	0.27	0.20	0.17
p,m-Xylene	<b>0.90</b>	0.25	0.20	0.16
o-Xylene	<b>0.89</b>	0.28	0.21	0.17
Styrene	0.35	<b>0.69</b>	0.00	0.03
1,2,4-Trimethylbenzene	<b>0.89</b>	0.28	0.19	0.10
1,3,5-Trimethylbenzene	<b>0.90</b>	0.28	0.18	0.06
1,2,3-Trimethylbenzene	<b>0.76</b>	0.43	0.28	0.10
4-Ethyl toluene	<b>0.79</b>	0.29	0.20	0.00
2-Ethyl toluene	<b>0.89</b>	0.30	0.18	0.09
Isopropylbenzene	<b>0.56</b>	0.48	0.44	0.19
n-Propylbenzene	<b>0.73</b>	0.46	0.35	0.09
p-Isopropyltoluene	0.35	0.21	<b>0.68</b>	0.12
Naphthalene	0.19	<b>0.74</b>	0.13	0.15
Tetrachloroethene	0.42	<b>0.58</b>	0.30	0.10
Carbon tetrachloride	0.06	0.06	0.01	<b>0.92</b>
1,4-Dichlorobenzene	0.24	<b>0.56</b>	0.48	0.14
Methyl cyclohexane	0.48	<b>0.59</b>	0.30	0.17
n-Nonane	0.35	<b>0.57</b>	0.46	-0.03
n-Decane	0.45	<b>0.54</b>	0.42	0.03
$\alpha$ -Pinene	0.10	0.03	<b>0.81</b>	-0.09
d-Limonene	0.24	0.44	<b>0.69</b>	0.07

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