

A.1 Technology Name

Waterloo Membrane Sampler

A.1.1 Source

Indoor Air Quality Assessment Report, X Facility, Santa Ana, California, CDM Smith (Irvine, CA), March 06, 2015

A.1.2 Summary

Media:	Indoor Air
Study Type:	Site Investigation with Passive Sampling, with limited active sampling for comparison.
Technology:	Waterloo Membrane Sampler
Peer Reviewed:	No
Publication Date:	March 6, 2015

A.1.3 Site Description

General site description and conditions

The Site occupies approximately 15-acres with several buildings used for industrial manufacturing, a maintenance shop, chemical storage warehouse, and a wastewater treatment plant with small laboratory, office and maintenance shop. An asphalt parking lot occupies approximately half the Site surface area, and a highway is approximately 0.5 mile from the Site.

Contaminants of concern (COCs)

Solvent degreasers, plating and surface preparation activities

COCs were volatile organic compounds (VOCs), and included tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), vinyl chloride (VC), and benzene.

Sampling frequency of COCs

A total of 20 indoor air samples were collected from 20 different locations on-site. The sampling period was 7 days, using the Waterloo Membrane Samper (WMS), a thermal desorption passive sampler. Co-located air samples were collected over a 24-hour sampling period using 6-liter evacuated certified clean Summa canisters in nine of the locations. At some of the locations where cannister samples were collected, a total of three, 24-hour samples were collected to coincide with Day 1, Day 4, and Day 7 of the WMS passive sampling period. The Summa cannister samples were used as side-by-side comparison as discrete samples to the time-averaged WMS.

A total of five ambient air samples were collected using WMS over a 7 day sampling period. Two, 24-hour summa canister ambient air samples were collected at two of the same locations where WMS samples were collected.

Technology Used

Samples were shipped under appropriate chain of custody protocols to Eurofins Air Toxics Ltd. For analysis of VOCs using U.S. EPA Method TO-17. Waterloo Samplers with charcoal sorbent bed, followed by modified TO-17 (collection of VOCs in ambient air using sorbents and analysis by GC/MS, instead of active sample collection using a pump and thermal desorption as the prep step). Sample hold time is 56 months for RAD130 and WMS. Sample preservation requirements are storage in cool, solvent-free refrigerator and optional use of ice during shipping. The indoor air samples (both WMS and Summa canisters) were placed 5 to 6 feet above the ground level, and sampling was conducted at the facility under conditions representative of day-to-day operations, with normal operation of the HVAC systems. Where possible, indoor air samples were collected in the center of the room, away from doors, windows, or corners. Sampling locations in front of or near ventilation ducts, where strong air flow currents are present were avoided as they were not considered representative of typical air flow patterns.

Ambient samples were located 5 to 6 feet above ground surface, at least 10 feet beyond a tree's drip line, and located away from apparent fuel and solvent sources. Upwind ambient samples were collected on the upwind side of a building at a distance equal to or twice the height of the building, or along the property fence line if the recommended distance could not be met due to property boundary limits.

The WMS samplers were checked periodically throughout the 7-day sampling period to ensure that the samplers were not compromised. Field observations and discrepancies were noted. Weather conditions, such as temperature and humidity at time of sampling commencement and at sampling completion for each sampling device at each location were recorded. Relative humidity ranged from 50.3 to 61.3%, barometric pressure ranged from 30.14 to 30.5 in Hg, temperature measurements ranged from 71F to 77.3F. Indoor air samples had the greatest temperature variability in the main warehouse locations open to ambient air conditions, compared to HVAC systems-controlled closed offices. Differential air pressures were also measured in the vicinity of the indoor air samples. All locations were measured to range from 0 to -0.01 inches of water column (in H₂O), with the exception of one indoor air location (0.003 in H₂O).

The samples were transported under standard chain-of-custody procedures to an accredited laboratory. The WMS samples were analyzed using modified U.S. EPA Method TO-17 which uses thermal desorption (TD) for extraction and gas chromatograph/mass spectrometer (GC/MS) methodology for analysis of 35 VOCs. The Summa canisters were analyzed for VOCs by GC/MS methodology using U.S. EPA Method TO-15. A total of two duplicate WMS samples and one duplicate Summa canister were used to assess the aggregate precision of sampling techniques and laboratory analysis.

A.1.4 Remedial Phase

The purpose of this sampling was to evaluate potential vapor intrusion of sub-surface vapor forming chemicals into indoor air.

A.1.5 Outcome

For the purposes of this case study, only data for WMS samples with co-located Summa canister samples are presented. Ambient air and indoor air data are shown in Table, below.

Comparison of the 7-day WMS to the co-located 24-hr Summa canister samples indicated a correlation and consistency among the detected values of VOCs for the two sampler types.

A.1.6 References

List references or citations.

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Sampled Air	Sampler Type	Sample Number	Sampling Date	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,3,5-Trimethylbenzene	1,4-Dioxane
Ambient Air	WMS	AA-002	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.14	NA
Ambient Air	Summa	AA-002	10/15/2014	0.21 U	0.14 U	0.067 U	0.14 U	0.82 U	0.60 U
Ambient Air	WMS	AA-004	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.096	NA
Ambient Air	Summa	AA-004	10/14/2014	0.21 U	0.13 U	0.063 U	0.13 U	0.79 U	0.58 U
Indoor Air	WMS	IA-001	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.15	NA
Indoor Air	WMS duplicate	FD-001-DUP	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.13	NA
Indoor Air	Summa (Day 1)	IA-001	10/15/2014	0.21 U	0.11 U	0.055 U	0.11 U	0.68 U	0.50 U
Indoor Air	Summa (Day 4)	IA-001	10/18/2014	0.21 U	0.14 U	0.067 U	0.14 U	0.82 U	0.60 U
Indoor Air	Summa (Day 7)	IA-001	10/21/2014	0.21 U	0.13 U	0.066 U	0.13 U	0.82 U	0.60 U
Indoor Air	WMS	IA-004	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.11	NA
Indoor Air	Summa	IA-004	10/15/2014	0.21 U	0.13 U	0.14	0.53	0.82 U	0.60 U
Indoor Air	Summa duplicate	FD-004-DUP	10/15/2014	0.21 U	0.13 U	0.064 U	0.13 U	0.79 U	1.4
Indoor Air	WMS	IA-006	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.14	NA
Indoor Air	Summa (Day 1)	IA-006	10/15/2014	0.21 U	0.12 U	0.061 U	0.12 U	0.76 U	0.56 U
Indoor Air	Summa (Day 4)	IA-006	10/18/2014	0.21 U	0.11 U	0.053 U	0.11 U	0.65 U	0.48 U
Indoor Air	Summa (Day 7)	IA-006	10/21/2014	0.21 U	0.12 U	0.060 U	0.12 U	0.75 U	0.55 U
Indoor Air	WMS	IA-007	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.1	NA
Indoor Air	WMS duplicate	FD-007-DUP	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.084	NA
Indoor Air	Summa (Day 1)	IA-007	10/15/2014	0.21 U	0.17 U	0.084 U	0.17 U	1.0 U	0.77 U
Indoor Air	Summa (Day 4)	IA-007	10/18/2014	0.21 U	0.34 U	0.17 U	0.34 U	2.1 U	1.5 U
Indoor Air	Summa (Day 7)	IA-007	10/21/2014	0.21 U	0.27 U	0.13 U	0.27 U	1.6 U	1.2 U
Indoor Air	WMS	IA-010	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.11	NA
Indoor Air	Summa	IA-010	10/15/2014	0.21 U	0.12 U	0.061 U	0.33	0.75 U	0.55 U
Indoor Air	WMS	IA-014	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.078	NA
Indoor Air	Summa	IA-014	10/15/2014	0.21 U	0.14 U	0.068 U	0.14 U	0.85 U	0.62 U
Indoor Air	WMS	IA-015	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.077	NA
Indoor Air	Summa	IA-015	10/15/2014	0.21 U	0.13 U	0.065 U	0.13 U	0.81 U	0.59 U
Indoor Air	WMS	IA-016	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.1	NA
Indoor Air	Summa	IA-016	10/15/2014	0.21 U	0.13 U	0.064 U	0.13 U	0.80 U	0.58 U
Indoor Air	WMS	IA-019	10/21/2014	0.21 U	0.19 U	0.24 U	0.15 U	0.1	NA
Indoor Air	Summa	IA-019	10/15/2014	0.21 U	0.12 U	0.061 U	0.12 U	0.75 U	0.55 U

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Sampled Air	Sampler Type	Sample Number	Sampling Date	1,4-Dichlorobenzene	2-Butanone	2-Propanol	4-Methyl-2-pentanone	Acetone	Benzene
Ambient Air	WMS	AA-002	10/21/2014	0.12	4.7 U	NA	0.63 U	22 J	1
Ambient Air	Summa	AA-002	10/15/2014	0.20 U	2.5 U	2.1 U	0.69 U	7.3	0.43
Ambient Air	WMS	AA-004	10/21/2014	0.12	4.7 U	NA	0.64 U	19 J	1.1
Ambient Air	Summa	AA-004	10/14/2014	0.19 U	2.4 U	2.6	0.66 U	10	0.38
Indoor Air	WMS	IA-001	10/21/2014	0.094	4.7 U	NA	0.64 U	10 J	0.81
Indoor Air	WMS duplicate	FD-001-DUP	10/21/2014	0.078	4.7 U	NA	0.64 U	9.4 J	0.86
Indoor Air	Summa (Day 1)	IA-001	10/15/2014	0.17 U	2.0 U	2.4	0.57 U	12	0.33
Indoor Air	Summa (Day 4)	IA-001	10/18/2014	0.20 U	2.5 U	3	0.69 U	17 J	0.47
Indoor Air	Summa (Day 7)	IA-001	10/21/2014	0.20 U	2.6	2.2	0.68 U	13 J	0.36
Indoor Air	WMS	IA-004	10/21/2014	0.1	7.2	NA	0.64 U	16 J	0.98
Indoor Air	Summa	IA-004	10/15/2014	0.20 U	2.4 U	2.3	0.68 U	18	0.38
Indoor Air	Summa duplicate	FD-004-DUP	10/15/2014	0.25	2.4 U	2.7	0.66 U	21	0.43
Indoor Air	WMS	IA-006	10/21/2014	0.18	4.7 U	NA	0.88	32 J	0.94
Indoor Air	Summa (Day 1)	IA-006	10/15/2014	0.19 U	3.2	6.1	0.63 U	120	0.37
Indoor Air	Summa (Day 4)	IA-006	10/18/2014	0.16 U	2.2	7	0.54 U	74 J	0.36
Indoor Air	Summa (Day 7)	IA-006	10/21/2014	0.18 U	3.8	5.3	0.9	22 J	0.37
Indoor Air	WMS	IA-007	10/21/2014	0.15	4.7 U	NA	2	15 J	1.1
Indoor Air	WMS duplicate	FD-007-DUP	10/21/2014	0.11	4.7 U	NA	1.9	12 J	0.74 U
Indoor Air	Summa (Day 1)	IA-007	10/15/2014	0.26 U	3.1 U	170	1	20	0.39
Indoor Air	Summa (Day 4)	IA-007	10/18/2014	0.50 U	6.2 U	91	1.7 U	20 J	0.67 U
Indoor Air	Summa (Day 7)	IA-007	10/21/2014	0.40 U	4.9 U	200	1.5	22 J	0.53 U
Indoor Air	WMS	IA-010	10/21/2014	0.14	4.7 U	NA	0.64 U	9.3 J	1.5
Indoor Air	Summa	IA-010	10/15/2014	0.2	2.2 U	5.9	0.63 U	11	0.43
Indoor Air	WMS	IA-014	10/21/2014	0.092	4.7 U	NA	0.64 U	11	0.96
Indoor Air	Summa	IA-014	10/15/2014	0.21 U	2.6 U	2.1 U	0.71 U	14	0.32
Indoor Air	WMS	IA-015	10/21/2014	0.088	4.7 U	NA	0.7	11	0.99
Indoor Air	Summa	IA-015	10/15/2014	0.20 U	2.4 U	2.0 U	0.67 U	12	0.35
Indoor Air	WMS	IA-016	10/21/2014	0.12	4.7 U	NA	0.64 U	9.5	1
Indoor Air	Summa	IA-016	10/15/2014	0.19 U	2.4 U	2.0 U	0.66 U	9.3	0.38
Indoor Air	WMS	IA-019	10/21/2014	0.13	4.7 U	NA	0.63 U	10	0.99
Indoor Air	Summa	IA-019	10/15/2014	0.18 U	5	40	0.63 U	9.7	0.44

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Sampled Air	Sampler Type	Sample Number	Sampling Date	cis-1,2-Dichloroethene	Carbon Tetrachloride	Carbon Disulfide	Chloroform	Chloromethane	Cyclohexane	Freon 12
Ambient Air	WMS	AA-002	10/21/2014	0.10 U	0.25	NA	0.12 U	0.45 U	0.32	NA
Ambient Air	Summa	AA-002	10/15/2014	0.13 U	0.46	2.6 U	0.37	0.87	0.58 U	2
Ambient Air	WMS	AA-004	10/21/2014	0.10 U	0.23	NA	0.12 U	0.45 U	0.12	NA
Ambient Air	Summa	AA-004	10/14/2014	0.13 U	0.39	2.7 J	0.43	0.9	0.55 U	2
Indoor Air	WMS	IA-001	10/21/2014	0.10 U	0.23	NA	0.12 U	0.45 U	0.092	NA
Indoor Air	WMS duplicate	FD-001-DUP	10/21/2014	0.10 U	0.20 U	NA	0.12 U	0.45 U	0.082	NA
Indoor Air	Summa (Day 1)	IA-001	10/15/2014	0.11 U	0.4	2.2 U	0.26	0.97	0.48 U	2
Indoor Air	Summa (Day 4)	IA-001	10/18/2014	0.13 U	0.4	2.6 U	0.36	0.91	0.58 U	2.1
Indoor Air	Summa (Day 7)	IA-001	10/21/2014	0.13 U	0.4	2.6 U	0.31	0.94	0.57 U	2.1
Indoor Air	WMS	IA-004	10/21/2014	0.10 U	0.20 U	NA	0.12 U	0.45 U	0.17	NA
Indoor Air	Summa	IA-004	10/15/2014	0.13 U	0.4	2.6 U	0.32	0.85	0.57 U	2
Indoor Air	Summa duplicate	FD-004-DUP	10/15/2014	0.13 U	0.38	2.5 U	0.32	0.88	0.55 U	2
Indoor Air	WMS	IA-006	10/21/2014	0.10 U	0.2	NA	0.12 U	0.45 U	0.11	NA
Indoor Air	Summa (Day 1)	IA-006	10/15/2014	0.14	0.4	2.4 U	0.35	0.92	0.53 U	2
Indoor Air	Summa (Day 4)	IA-006	10/18/2014	0.13	0.43	2.1 U	0.32	0.91	0.46 U	2
Indoor Air	Summa (Day 7)	IA-006	10/21/2014	0.16	0.4	2.4 U	0.34	0.96	0.52 U	2
Indoor Air	WMS	IA-007	10/21/2014	0.37	0.21 U	NA	0.12 U	0.46 U	0.16	NA
Indoor Air	WMS duplicate	FD-007-DUP	10/21/2014	0.35	0.21 U	NA	0.12 U	0.46 U	0.26	NA
Indoor Air	Summa (Day 1)	IA-007	10/15/2014	0.53	0.38	11 J	0.42	0.98	0.73 U	2
Indoor Air	Summa (Day 4)	IA-007	10/18/2014	0.59	0.53 U	6.5 U	0.58	0.94	1.4 U	2
Indoor Air	Summa (Day 7)	IA-007	10/21/2014	0.71	0.51	5.1 U	0.5	0.95	1.1 U	2
Indoor Air	WMS	IA-010	10/21/2014	0.10 U	0.20 U	NA	0.12 U	0.45 U	0.35	NA
Indoor Air	Summa	IA-010	10/15/2014	0.12 U	0.38	2.4 U	0.92	0.93	0.53 U	2
Indoor Air	WMS	IA-014	10/21/2014	0.10 U	0.2	NA	0.12 U	0.45 U	0.14	NA
Indoor Air	Summa	IA-014	10/15/2014	0.14 U	0.4	2.7 U	0.29	0.88	0.60 U	2
Indoor Air	WMS	IA-015	10/21/2014	0.10 U	0.21	NA	0.12 U	0.46 U	0.49	NA
Indoor Air	Summa	IA-015	10/15/2014	0.13 U	0.41	2.6 U	0.42	1.2	0.58	2
Indoor Air	WMS	IA-016	10/21/2014	0.10 U	0.23	NA	0.12 U	0.45 U	0.16	NA
Indoor Air	Summa	IA-016	10/15/2014	0.13 U	0.4	8.4 J	0.27	1.2	0.56 U	2
Indoor Air	WMS	IA-019	10/21/2014	0.10 U	0.20 U	NA	0.12 U	0.45 U	0.32	NA
Indoor Air	Summa	IA-019	10/15/2014	0.12 U	0.4	2.4 U	0.29	0.94	0.53 U	2

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Sampled Air	Sampler Type	Sample Number	Sampling Date	Ethylbenzene	Ethanol	Freon 113	Heptane	Hexane	Methylene Chloride
Ambient Air	WMS	AA-002	10/21/2014	0.32	NA	NA	0.87 U	3	NA
Ambient Air	Summa	AA-002	10/15/2014	0.28	7.8	1.3 U	0.69 U	0.59 U	1.2 U
Ambient Air	WMS	AA-004	10/21/2014	0.26	NA	NA	0.87 U	1.4 U	NA
Ambient Air	Summa	AA-004	10/14/2014	0.23	6.8	1.2 U	0.66 U	0.56 U	1.1 U
Indoor Air	WMS	IA-001	10/21/2014	0.23	NA	NA	0.87 U	1.4 U	NA
Indoor Air	WMS duplicate	FD-001-DUP	10/21/2014	0.21	NA	NA	0.87 U	1.4 U	NA
Indoor Air	Summa (Day 1)	IA-001	10/15/2014	0.18	10	1.1 U	0.57 U	0.49 U	0.96 U
Indoor Air	Summa (Day 4)	IA-001	10/18/2014	0.25	18	1.3 U	0.69 U	0.59 U	1.2 U
Indoor Air	Summa (Day 7)	IA-001	10/21/2014	0.2	14	1.3 U	0.68 U	0.58 U	1.2 U
Indoor Air	WMS	IA-004	10/21/2014	0.27	NA	NA	1.7	1.4	NA
Indoor Air	Summa	IA-004	10/15/2014	0.2	15	1.3 U	0.68 U	0.58 U	1.2 U
Indoor Air	Summa duplicate	FD-004-DUP	10/15/2014	0.24	16	1.2 U	0.66 U	0.57 U	1.1 U
Indoor Air	WMS	IA-006	10/21/2014	0.28	NA	NA	0.87 U	1.4	NA
Indoor Air	Summa (Day 1)	IA-006	10/15/2014	0.23	21	1.2 U	0.64 U	0.55 U	1.1 U
Indoor Air	Summa (Day 4)	IA-006	10/18/2014	0.21	19	1.0 U	0.54 U	0.47 U	0.92 U
Indoor Air	Summa (Day 7)	IA-006	10/21/2014	0.19	22	1.2 U	0.62 U	0.54 U	1.0 U
Indoor Air	WMS	IA-007	10/21/2014	0.28	NA	NA	0.88 U	1.7	NA
Indoor Air	WMS duplicate	FD-007-DUP	10/21/2014	0.27	NA	NA	0.88 U	2.5	NA
Indoor Air	Summa (Day 1)	IA-007	10/15/2014	0.23	1300 E	1.6 U	0.87 U	0.75 U	1.5 U
Indoor Air	Summa (Day 4)	IA-007	10/18/2014	0.36 U	1600 E	3.2 U	1.7 U	1.5 U	2.9 U
Indoor Air	Summa (Day 7)	IA-007	10/21/2014	0.29 U	700 E	2.5 U	1.4 U	1.2 U	2.3 U
Indoor Air	WMS	IA-010	10/21/2014	0.28	NA	NA	0.87 U	3.6	NA
Indoor Air	Summa	IA-010	10/15/2014	0.42	25	1.2 U	1.2	0.54 U	1.1 U
Indoor Air	WMS	IA-014	10/21/2014	0.23	NA	NA	0.87 U	1.5	NA
Indoor Air	Summa	IA-014	10/15/2014	0.19	12	1.3 U	0.71 U	0.61 U	1.2
Indoor Air	WMS	IA-015	10/21/2014	0.39	NA	NA	0.88 U	2.3	NA
Indoor Air	Summa	IA-015	10/15/2014	0.38	11	1.2 U	0.67 U	0.58 U	1.1 U
Indoor Air	WMS	IA-016	10/21/2014	0.26	NA	NA	0.87 U	2.2	NA
Indoor Air	Summa	IA-016	10/15/2014	0.16	6.3	1.2 U	0.66 U	0.57 U	1.1 U
Indoor Air	WMS	IA-019	10/21/2014	0.27	NA	NA	0.87 U	3	NA
Indoor Air	Summa	IA-019	10/15/2014	0.55	71	1.2 U	0.63 U	0.54 U	1.1 U

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Sampled Air	Sampler Type	Sample Number	Sampling Date	m,p-Xylene	Naphthalene	o-Xylene	Tetra-chloroethene (PCE)	Styrene	Trans-1,2-Dichloroethene
Ambient Air	WMS	AA-002	10/21/2014	1.3	0.077 U	0.43	0.098	0.47	0.30 U
Ambient Air	Summa	AA-002	10/15/2014	0.94	NA	0.36	0.23 U	0.72 U	0.67 U
Ambient Air	WMS	AA-004	10/21/2014	1	0.077 U	0.34	0.1	0.44	0.30 U
Ambient Air	Summa	AA-004	10/14/2014	0.58	NA	0.22	1.1	0.73	0.63 U
Indoor Air	WMS	IA-001	10/21/2014	0.9	0.078 U	0.32	0.097	0.47	0.30 U
Indoor Air	WMS duplicate	FD-001-DUP	10/21/2014	0.82	0.078 U	0.31 U	0.084	0.37	0.30 U
Indoor Air	Summa (Day 1)	IA-001	10/15/2014	0.6	NA	0.24	0.19 U	0.59 U	0.55 U
Indoor Air	Summa (Day 4)	IA-001	10/18/2014	0.85	NA	0.36	0.23 U	0.72 U	0.67 U
Indoor Air	Summa (Day 7)	IA-001	10/21/2014	0.63	NA	0.28	0.22 U	0.71 U	0.66 U
Indoor Air	WMS	IA-004	10/21/2014	1.1	0.078 U	0.35	0.11	0.41	0.30 U
Indoor Air	Summa	IA-004	10/15/2014	0.61	NA	0.22	0.22 U	0.71 U	0.66 U
Indoor Air	Summa duplicate	FD-004-DUP	10/15/2014	0.71	NA	0.26	0.22 U	0.68 U	0.64 U
Indoor Air	WMS	IA-006	10/21/2014	1.1	0.12 C	0.38	0.14	0.56	0.30 U
Indoor Air	Summa (Day 1)	IA-006	10/15/2014	0.73	NA	0.25	0.21 U	0.66 U	0.61 U
Indoor Air	Summa (Day 4)	IA-006	10/18/2014	0.68	NA	0.26	0.18 U	0.57 U	0.53 U
Indoor Air	Summa (Day 7)	IA-006	10/21/2014	0.63	NA	0.23	0.51	0.65 U	0.60 U
Indoor Air	WMS	IA-007	10/21/2014	1.1	0.078 U	0.39	0.26	0.68	0.65
Indoor Air	WMS duplicate	FD-007-DUP	10/21/2014	1	0.078 U	0.36	0.22	0.68	0.6
Indoor Air	Summa (Day 1)	IA-007	10/15/2014	0.73	NA	0.28	0.29 U	0.91 U	0.84 U
Indoor Air	Summa (Day 4)	IA-007	10/18/2014	0.94	NA	0.43	0.57 U	1.8 U	1.7 U
Indoor Air	Summa (Day 7)	IA-007	10/21/2014	0.73	NA	0.35	0.45 U	1.4 U	1.3 U
Indoor Air	WMS	IA-010	10/21/2014	1.1	0.078 U	0.37	0.26	0.72	0.30 U
Indoor Air	Summa	IA-010	10/15/2014	1.1	NA	0.47	0.61	0.65 U	0.61 U
Indoor Air	WMS	IA-014	10/21/2014	0.94	0.078 U	0.31 U	0.36	0.42	0.30 U
Indoor Air	Summa	IA-014	10/15/2014	0.65	NA	0.26	0.63	0.74 U	0.68 U
Indoor Air	WMS	IA-015	10/21/2014	1	0.078 U	0.36	0.32	0.89	0.30 U
Indoor Air	Summa	IA-015	10/15/2014	0.74	NA	0.29	0.51	0.70 U	0.65 U
Indoor Air	WMS	IA-016	10/21/2014	1	0.078 U	0.36	0.12	0.49	0.30 U
Indoor Air	Summa	IA-016	10/15/2014	0.55	NA	0.22	0.22 U	0.69 U	0.64 U
Indoor Air	WMS	IA-019	10/21/2014	1	0.077 U	0.34	0.11	0.52	0.30 U
Indoor Air	Summa	IA-019	10/15/2014	1.9	NA	0.74	0.3	0.65 U	0.61 U

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Sampled Air	Sampler Type	Sample Number	Sampling Date	Trichloro-ethene (TCE)	Trichloro-fluoromethane	1,2,4-Trimethylbenzene	Toluene	2,2,4-Trimethylpentane	Vinyl chloride
Ambient Air	WMS	AA-002	10/21/2014	0.082 U	NA	0.49	2.5	NA	1.1 U
Ambient Air	Summa	AA-002	10/15/2014	0.18 U	1	0.82 U	1.6	3.9 U	0.043 U
Ambient Air	WMS	AA-004	10/21/2014	0.082 U	NA	0.32	2.6	NA	1.1 U
Ambient Air	Summa	AA-004	10/14/2014	0.17 U	1.1	0.79 U	2.8	3.7 U	0.041 U
Indoor Air	WMS	IA-001	10/21/2014	0.082 U	NA	0.5	2.3	NA	1.1 U
Indoor Air	WMS duplicate	FD-001-DUP	10/21/2014	0.082 U	NA	0.43	2.2	NA	1.1 U
Indoor Air	Summa (Day 1)	IA-001	10/15/2014	0.15 U	1	0.68 U	2.2	3.2 U	0.036 U
Indoor Air	Summa (Day 4)	IA-001	10/18/2014	0.18 U	1	0.82 U	1.8	3.9 U	0.043 U
Indoor Air	Summa (Day 7)	IA-001	10/21/2014	0.18 U	1.1	0.82 U	1.3	3.9 U	0.042 U
Indoor Air	WMS	IA-004	10/21/2014	0.082 U	NA	0.4	28 E	NA	1.1 U
Indoor Air	Summa	IA-004	10/15/2014	0.74	1	0.82 U	1.4	3.9 U	0.042 U
Indoor Air	Summa duplicate	FD-004-DUP	10/15/2014	0.17 U	1	0.79 U	1.6	3.8 U	0.041 U
Indoor Air	WMS	IA-006	10/21/2014	0.49	NA	0.52	3.2	NA	1.1 U
Indoor Air	Summa (Day 1)	IA-006	10/15/2014	0.79	1	0.76 U	2.3	14	0.040 U
Indoor Air	Summa (Day 4)	IA-006	10/18/2014	0.68	0.96	0.65 U	2.5	18	0.034 U
Indoor Air	Summa (Day 7)	IA-006	10/21/2014	0.94	1.1	0.75 U	2.1	3.6 U	0.039 U
Indoor Air	WMS	IA-007	10/21/2014	4.7	NA	0.37	3.7	NA	1.1 U
Indoor Air	WMS duplicate	FD-007-DUP	10/21/2014	4.4	NA	0.3	3.4	NA	1.1 U
Indoor Air	Summa (Day 1)	IA-007	10/15/2014	5.5	1.2 U	1.0 U	2.3	5.0 U	0.054 U
Indoor Air	Summa (Day 4)	IA-007	10/18/2014	6	2.4 U	2.1 U	3.7	9.8 U	0.11 U
Indoor Air	Summa (Day 7)	IA-007	10/21/2014	6	1.8 U	1.6 U	4.6	7.7 U	0.084 U
Indoor Air	WMS	IA-010	10/21/2014	0.13	NA	0.44	7.6	NA	1.1 U
Indoor Air	Summa	IA-010	10/15/2014	0.19	0.97	0.75 U	8.8	3.6 U	0.039 U
Indoor Air	WMS	IA-014	10/21/2014	0.2	NA	0.32	2.5	NA	1.1 U
Indoor Air	Summa	IA-014	10/15/2014	0.39	1	0.85 U	1.7	4.0 U	0.044 U
Indoor Air	WMS	IA-015	10/21/2014	0.11	NA	0.31	2.6	NA	1.1 U
Indoor Air	Summa	IA-015	10/15/2014	0.23	1.1	0.81 U	2.3	3.8 U	0.042 U
Indoor Air	WMS	IA-016	10/21/2014	0.082 U	NA	0.38	2.9	NA	1.1 U
Indoor Air	Summa	IA-016	10/15/2014	0.17 U	0.99	0.80 U	1.6	3.8 U	0.041 U
Indoor Air	WMS	IA-019	10/21/2014	0.1	NA	0.38	4.1	NA	1.1 U
Indoor Air	Summa	IA-019	10/15/2014	0.16 U	1.1	0.75 U	3.6	3.6 U	0.039 U

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153 All units in micrograms per cubic (µg/m3)

154 C = Estimated SR

155 E = Exceeded instrument calibration range

156 J = Results are estimated due to results exceeding the calibration range

157 U = Below detection limit

158 NA = Not Analyzed

159 SR = Analyte-specific uptake rate