MEMORANDUM

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

To: Billy Meyer

From: Christie Zawtocki, PE
Timothy Klotz

Date: July 14, 2014

Project: One Hour Martinizing Site, DSCA ID 32-0013
1103 W Club Blvd, Durham, NC

Subject: Monthly Update

Hart & Hickman, PC (H&H) is proceeding with implementation of the Remedial Action Plan (RAP) for the One Hour Martinizing site. The groundwater remedial action, which consisted of injecting EHC into the source area aquifer, was completed at the site between January 8 and 25, 2014. An *EHC Injection Report* was submitted to the DSCA Program on March 31, 2014, and post-injection sampling activities and results have been described in the monthly updates. A brief summary of recent post-injection sampling activities is provided below. An updated project calendar is provided in Attachment A.

Soil Vapor Field Screening

H&H completed a post-injection soil vapor field screening event at the site on June 17, 2014. The event included measuring total volatile organic compounds (VOCs), methane, carbon dioxide, and oxygen in soil vapor, indoor air, and outdoor ambient air. The primary purpose of the sampling is to confirm methane levels are within acceptable standards. Measurements were scheduled to be collected at the following locations:

- Soil Vapor Monitoring Points: SV-8S/8I, SV-18S, SV-19S, SV-20S/D, SV-29S, SV-55S/I
- Excavation Vent Exhaust Pipe
- Sub-Slab Depressurization (SSD) System Exhaust and Indoor Air at 1414 Watts St (Triangle Family Church)
- Ambient, Outdoor Air on Source Property

Measurements could not be collected from SV-8I and SV-55I due to moisture/lack of air flow and could not be collected from the sub-slab depressurization system exhaust at the Triangle Family Church. Additional measurements were collected from SV-14, SV-21S/D, SV-25S/D, SV-27S/D, SV-28D, SV-29D, SV-36S/D, SV-49S/D, and SV-50. The field screening data are summarized in the attached Table 1, and the methane readings collected between June 2013 and

June 2014 are shown on the attached Figure 1. Recorded field measurements indicate that methane was not detected in any of the sampled soil vapor points.

Methane was detected at a concentration of 4.8% by volume in the vapors from the excavation passive exhaust vent during the June 2014 sampling event. These vapors are exhausted into the atmosphere through the stack installed on the source property where they dissipate into the atmosphere. Ambient air monitoring conducted near ground level in the immediate vicinity of the exhaust vent did not detect any measurable methane.

VOCs were detected in each of the monitored soil vapor points, except for SV-28D and SV-49S/D. In general, the soil vapor VOC concentrations are lower than the pre-injection concentrations at most sampling locations. The highest VOC concentration was detected in deep soil vapor point SV-29D (1365 ppm) located on the 1419 Dollar Ave property east/southeast of the source property. The shallow soil gas at this location had a much lower VOC concentration of 169 ppm (SV-29S).

Indoor Air Monitoring

In May and June 2014, H&H collected post-injection indoor air samples at the three structures adjacent to the source property where vapor mitigation systems are in place (1419 Dollar Ave, 1421 Dollar Ave, and 1414 Watts St). The samples were collected following installation of additional vapor mitigation measures. In May 2014, the mitigation systems at 1419 and 1421 Dollar Ave were modified to include sub-membrane depressurization in the crawlspaces and sub-slab depressurization in the basements. The mitigation system at 1414 Watts St was modified to include additional sub-slab vapor extraction points and vent fans. The modified mitigation systems were started up on May 12, 2014.

On May 25, 2014 and June 22, 2014, H&H collected two Summa canister indoor air samples from the Triangle Family Church at 1414 Watts St during the church's Sunday service. The samples were collected over a time period of approximately two to three hours. For the residences at 1419 and 1421 Dollar Ave, H&H collected two 14-day indoor air samples from the 1419 and 1421 Dollar Ave residences using passive Radiello sampling devices. The sampling dates are shown on the attached calendar for both May and June. The results for the May 2014 samples collected at 1414 Watts Ave were discussed in the last monthly update and, therefore, are not discussed below. The June results for 1419 and 1421 Dollar Ave are not yet available; thus, only the May sample results (collected between May 19 and June 2, 2014) are discussed below.

The indoor air samples were submitted for laboratory analysis of tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene, trans-1,2- dichloroethene, and vinyl chloride. The analytical results for the indoor air samples are summarized in Table 2 and presented on Figure 2. Please note that the June 2014 indoor air sample results for 1419 and 1421 Dollar Ave will be provided in the next monthly update.

PCE was detected in each of the indoor air samples collected at 1414 Watts St at concentrations of 2.8 $\mu g/m^3$ (1414-Front) and 4.1 $\mu g/m^3$ (1414-Rear) in June 2014. The detected PCE concentrations at the Triangle Family Church are lower than historical concentrations indicating that the mitigation system improvements are effectively reducing indoor air concentrations. To evaluate the risk associated with the detected indoor air concentrations, H&H evaluated a residential exposure scenario assuming 6 hours per week of exposure time, which is typical of a Triangle Family Church parishioner. As shown in the worksheets provided in Attachment B, the calculated cumulative carcinogenic risk levels are $5.94x10^{-8}$ and $8.69x10^{-8}$ and the hazard index levels are from 0.016 and 0.023 for the 1414-Front and 1414-Rear samples, respectively. These risk levels are well within acceptable levels.

PCE was detected in each of the indoor air samples collected from the residences at 1419 Dollar Ave (0.66 $\mu g/m^3$ and 0.77 $\mu g/m^3$) and 1421 Dollar Ave (1.6 $\mu g/m^3$ and 3.6 $\mu g/m^3$). The detected PCE concentrations in both residences are below the DWM Residential Indoor Air Screening Level of 8.34 $\mu g/m^3$. Comparison of pre- and post-mitigation sample results indicates that PCE concentrations were reduced at 1419 Dollar Ave, and TCE was not detected in any of the post-mitigation indoor air samples. H&H calculated the risk associated with the detected indoor air concentrations. As shown in the worksheets in Attachment C, the carcinogenic risk levels are less than $1x10^{-6}$ and the hazard index levels are substantially less than 1.

Concurrent with the May indoor air sampling at 1419 and 1421 Dollar Ave, H&H collected two outdoor air samples (1419-OUT and 1421-OUT) between the source property and the residences. PCE was detected in both of the outdoor air samples at a concentration of 1.4 $\mu g/m^3$. The sample locations and results are shown on Figure 2.

Future Sampling Activities

A project calendar identifying planned sampling activities through January 2015 is provided in Attachment A. Details regarding the planned sampling activities were provided in the May 13, 2014 update. The next sampling activities include monthly methane field screening, indoor air sampling, groundwater sampling, and soil gas sampling events in July 2014. H&H anticipates providing the next update in late August/early September so that we can include the groundwater and soil gas sampling results.

TABLES

Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements **ADT 1**

DSCA ID No.: 32-0013

Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
			ppm	%	%	%
SV-8S	5.0	11/27/12	427	0.1	1.7	20.0
		01/08/13	1,833	0.8	2.2	18.7
		02/07/13	NA	0.1	2.0	19.2
		03/08/13	NA	0.0	2.4	18.8
		04/08/13	465	0.0	2.4	17.7
		05/08/13	473	0.0	4.1	15.7
		06/13/13	360	0.0	5.7	13.7
		07/08/13	349	0.0	5.8	13.4
		08/14/13	427	0.1	5.4	15.6
		09/11/13	423	0.2	4.1	15.1
		10/09/13	313	0.3	3.0	18.0
		11/13/13	385	0.2	3.4	16.2
		12/19/13	390	0.2	3.1	16.1
		01/08/14	492	0.2	3.8	18.4
		02/03/14	50.8	0.1	1.5	19.5
		02/17/14	140	0.0	1.5	18.8
		03/17/14	109	0.0	2.0	18.4
		04/14/14	164	0.0	3.0	16.2
		05/22/14	324	0.0	8.0	8.4
		06/17/14	324	0.0	8.0	8.4
SV-8I	17.0	11/27/12	>9,999	0.0	2.5	18.8
		01/08/13	2222	1.3	2.8	18.3
		02/07/13	NM	0.2	2.2	18.6
		03/08/13	NM	0.1	2.4	17.9
		04/08/13	4,098	0.2	1.8	17.6
		05/08/13	1,720	0.2	3.9	13.3
		06/13/13	248	0.2	1.8	16.5
		07/08/13	305	0.2	2.3	15.9
		08/14/13	165	0.3	2.1	15.6
		09/11/13	3,056	0.2	1.2	11.2
		10/09/13	119	0.5	2.5	15.9
		11/13/13	310	0.3	1.8	12.4
		12/19/13	320	0.4	2.1	13.4
		01/08/14	534	0.2	2.4	19.4
		02/03/14	NM	NM	NM	NM
		02/17/14	317	0.0	3.8	19.1
		03/17/14	265	0.0	4.1	19.5
		04/14/14	92.5	0.0	1.3	20.2
		05/22/14	249	0.3	29.1	0.9
		06/17/14	NM	NM	NM	NM
SV-14	5.0	05/22/14	220	0.0	5.8	13.3
		06/17/14	68.9	0.0	5.5	14.5

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Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
			ppm	%	%	%
SV-18	5.0	11/27/12	22.3	0.0	2.5	19.2
		01/08/13	51.1	0.4	0.0	21.5
		02/07/13	NM	0.0	2.3	18.6
		03/08/13	NM	0.0	4.1	16.9
		04/08/13	2.1	0.0	2.5	18.1
		05/08/13	14.9	0.0	4.9	15.9
		06/13/13	20.7	0.0	4.7	16.2
		08/14/13	26.1	0.1	3.0	18.2
		09/11/13	84.5	0.1	2.9	16.5
		10/09/13	201	0.0	3.5	17.5
		11/13/13	102	0.0	3.1	16.8
		12/19/13	100	0.0	3.2	15.8
		01/08/14	52.5	0.0	3.6	18.5
		02/03/14	25.7	0.2	1.3	20.8
		02/17/14	22.1	0.1	0.9	20.8
		03/17/14	NM	NM	NM	NM
		04/14/14	6.3	0.0	3.0	18.1
		05/23/14	11.5	0.0	5.2	14.8
		06/17/14	26.4	0.0	3.5	17.8
SV-19	5.0	11/27/12	2.25	0.0	10.8	11.5
		01/08/13	4.50	0.6	9.1	13.3
		02/07/13	NM	0.0	8.6	13.9
		03/08/13	NM	0.0	8.3	13.5
		04/08/13	1.2	0.0	8.3	13.7
		05/08/13	0.9	0.0	9.1	13.0
		06/13/13	6.2	0.0	9.7	11.7
		08/15/13	4.4	0.0	9.2	12.1
		09/11/13	22.9	0.0	10.1	9.3
		10/09/13	156	0.0	11.9	9.8
		11/13/13	86.4	0.0	9.8	10.4
		12/19/13	92.6	0.0	8.7	13.4
		01/08/14	91.6	0.0	9.8	13.5
		02/03/14	16.4	0.2	3.3	18.8
		02/17/14	19.7	0.0	2.8	19.4
		03/17/14	0.0	0.0	2.8	20.2
		04/14/14	0.0	0.0	2.5	18.5
		05/23/14	552.0	0.0	4.4	16.6
		06/17/14	22.7	0.0	2.3	17.9

Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements **ADT 1**

DSCA ID No.: 32-0013

Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
			ppm	%	%	%
SV-20S	5.0	11/27/12	75.5	0.0	6.3	16.1
		01/08/13	15.0	1.3	5.0	16.9
		02/07/13	NM	0.1	6.4	15.5
		03/08/13	NM	0.0	5.0	16.0
		04/08/13	47.4	0.0	5.2	15.3
		05/08/13	62.5	0.0	6.3	14.6
		06/13/13	64.0	0.0	7.7	13.1
		08/15/13	61.8	0.0	6.8	13.6
		09/11/13	60.4	0.1	5.1	15.3
		10/09/13	89.7	0.1	7.0	15.3
		11/13/13	78.1	0.0	6.8	14.4
		12/19/13	84.1	0.0	7.2	14.8
		01/08/14	104.0	0.0	7.3	15.5
		02/03/14	20.8	0.2	2.5	19.3
		02/17/14	28.4	0.0	3.4	18.4
		03/17/14	7.6	0.0	4.7	18.8
		04/14/14	13.4	0.0	3.5	17.3
		05/23/14	80.5	0.0	4.3	15.7
		06/17/14	81.4	0.0	5.2	15.8
SV-20D	20.0	01/08/13	11.10	0.4	7.6	15.2
		02/07/13	NM	0.1	6.7	15.6
		03/08/13	NM	0.0	6.8	14.9
		04/08/13	46.8	0.0	6.7	15.2
		05/08/13	61.4	0.0	5.8	15.1
		06/13/13	58.9	0.0	7.1	13.5
		08/15/13	60.1	0.0	6.6	14.1
		09/11/13	93.1	0.1	7.6	12.5
		10/09/13	113	0.1	8.8	13.4
		11/13/13	101	0.0	8.2	12.8
		12/19/13	98.6	0.0	8.6	11.4
		01/08/14	115	0.0	8.6	15.3
		02/03/14	31.9	0.2	1.9	20.1
		02/17/14	34.4	0.0	2.5	19.5
		03/17/14	11.4	0.0	2.7	19.7
		04/14/14	23.9	0.0	3.1	18.3
		05/23/14	65.2	0.0	5.3	14.6
		06/17/14	88.1	0.0	4.8	14.7
SV-21S	8.0	05/23/14	131	0.0	8.8	10.5
		06/17/14	40.7	0.0	6.6	14.6
SV-21D	20.0	05/22/14	98.9	0.0	6.6	13.3
		06/17/14	13.6	0.0	3.4	166.0

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DSCA ID No.: 32-0013						
Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
			ppm	%	%	%
SV-25S		06/17/14	280	0.0	1.5	17.9
SV-25D		06/17/14	14.1	0.0	3.2	16.6
SV-27S	8.0	05/22/14	250	0.0	5.4	10.9
		06/17/14	157	0.0	1.9	17.5
SV-27D		06/17/14	254	0.0	0.2	19.9
SV-28D	20.0	05/22/14	37.2	0.0	8.1	8.0
		06/17/14	0.0	0.0	1.4	18.0
SV-29S	5.0	11/27/12	344	0.0	1.9	19.9
		01/08/13	96.3	0.3	2.0	19.8
		02/07/13	NM	0.1	2.3	18.6
		03/08/13	NM	0.0	2.8	17.6
		04/08/13	235	0.0	2.6	17.2
		05/08/13	151	0.0	3.3	16.7
		06/13/13	197	0.0	3.6	16.2
		08/14/13	317	0.1	3.4	17.7
		09/11/13	268	0.1	2.2	17.6
		10/09/13	356	0.0	3.2	18.0
		11/13/13	294	0.0	2.8	17.8
		12/19/13	264	0.0	3.1	15.4
		01/08/14	475	0.0	3.4	18.8
		02/03/14	266	0.2	1.2	20.6
		02/17/14	104	0.0	1.0	20.6
		03/17/14	56.4	0.0	0.7	20.6
		04/14/14	117	0.0	0.9	19.5
		05/23/14	22.3	0.0	1.9	18.7
		06/17/14	169	0.0	1.4	18.4
SV-29D	20.0	05/23/14	1019	0.0	3.9	14.0
		06/17/14	1365	0.0	2.1	15.5
SV-36S		06/17/14	341	0.0	2.9	15.9
SV-36D		06/17/14	131	0.0	4.2	16.0
SV-49S	8.0	05/22/14	148	0.0	0.5	18.5
		06/17/14	0.0	0.0	0.0	19.9
SV-49D	14.5	05/22/14	97	0.0	1.2	17.4
		06/17/14	0.0	0.0	7.0	4.2
SV-50		06/17/14	1090	0.0	7.6	7.4

Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements **ADT 1**

DSCA ID No.: 32-0013

Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
			ppm	%	%	%
SV-55S	5.0	11/27/12	430	0.2	0.2	21.1
		01/08/13	295	4.1	3.0	14.7
		02/07/13	NM	2.1	2.8	14.6
		03/08/13	NM	1.8	3.1	14.0
		04/08/13	311	1.4	3.0	14.3
		05/08/13	290	1.1	3.9	13.3
		06/13/13	295	0.8	4.5	11.8
		07/08/13	258	0.7	4.9	11.1
		08/14/13	133	0.2	1.8	17.8
		09/11/13	229	0.9	5.5	10.6
		10/09/13	501	0.8	5.4	13.6
		11/13/13	444	0.4	4.8	11.1
		12/19/13	421	0.6	4.2	16.2
		01/08/14	191	0.6	5.2	14.0
		02/03/14	58.3	0.4	3.6	18.1
		02/17/14	NM	NM	NM	NM
		03/17/14	7.3	0.3	1.4	19
		04/14/14	57.3	0.0	2.3	17.1
		05/22/14	176	0.1	5.3	11.3
		06/17/14	23.9	0.0	0.9	19.4
SV-55I	17.0	11/27/12	12	4.1	0.6	12.4
		01/08/13	442	3.6	2.0	12.1
		02/07/13	NM	1.4	2.9	14.8
		03/08/13	NM	1.6	3.5	14.6
		04/08/13	NM	NM	NM	NM
		05/08/13	NM	1.6	2.7	10.7
		06/13/13	86.5	1.5	1.6	11.0
		07/08/13	NM	1.5	2.1	10.6
		08/14/13	26.7	0.3	0.2	16.5
		09/11/13	31.3	0.3	1.9	15.4
		10/09/13	4.9	0.1	0.0	21.2
		11/13/13	17.4	0.2	1.0	16.5
		12/19/13	19.4	0.4	1.0	18.1
		01/08/14	127	0.7	3.2	16.9
		02/03/14	NM	NM	NM	NM
		02/17/14	NM	NM	NM	NM
		03/17/14	NM	NM	NM	NM
		04/14/14	NM	NM	NM	NM
		05/22/14	NM	NM	NM	NM
		06/17/14	NM	NM	NM	NM

Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements **ADT 1**

DSCA ID No.: 32-0013

Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
			ppm	%	%	%
Vent Exhaust Pipe		11/27/12	38.0	12.5	11.1	9.7
		01/08/13	173	11.0	9.3	10.6
		02/07/13	NM	17.3	15.9	1.5
		03/08/13	NM	16.4	15.0	1.7
		04/08/13	6.5	12.6	11.7	4.9
		05/08/13	10.8	15.0	14.4	1.9
		06/13/13	9.6	14.9	13.4	0.7
		07/08/13	9.6	14.5	13.0	0.8
		08/14/13	17.7	15.2	14.5	1.7
		09/11/13	14.7	15.7	13.4	1.5
		10/09/13	16.0	13.8	10.4	6.7
		11/13/13	15.8	12.9	11.1	4.4
		12/19/13	12.8	10.9	10.0	3.8
		01/08/14	9.2	8.7	12.0	5.1
		02/03/14	7.5	0.2	0.0	21.9
		02/17/14	30.7	23.2	16.2	6.1
		03/17/14	0.0	0.0	0.0	21.6
		04/14/14	0.0	6.4	6.1	13.2
		05/22/14	287.0	4.2	4.3	14.1
		06/17/14	580	4.6	4.6	14.1
SSD System Triangle Family Church 1414 Watts Street		11/27/12	2.4	0.1	0.0	21.0
		01/08/13	159	1.0	0.0	21.1
		02/07/13	NM	0.2	0.0	21.4
		03/08/13	NM	0.0	0.0	20.8
		04/08/13	0.0	0.0	0.0	20.8
		05/08/13	0.0	0.0	0.0	20.6
		06/13/13	0.0	0.0	0.0	20.4
		07/08/13	0.0	0.0	0.0	20.5
		08/14/13	4.4	0.1	0.0	20.5
		09/18/13	0.5	0.1	0.0	20.2
		10/09/13	6.1	0.1	0.1	21.1
		11/13/13	4.6	0.0	0.0	20.8
		12/19/13	5.2	0.0	0.0	21.4
		01/08/14	NM	NM	NM	NM
		02/03/14	NM	NM	NM	NM
		02/19/14	0.0	0.0	0.1	21.1
		03/17/14	0.0	0.0	0.0	21.4
		04/14/14	0.0	0.0	0.0	20.8
		05/22/14	NM	NM	NM	NM
		06/17/14	0.0/0.0	0.0/0.0	0.0/0.0	20.6/20.9

Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements **ADT 1**

DSCA ID No.: 32-0013

Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
			ppm	%	%	%
Indoor Air Triangle Family Church 1414 Watts Street		11/27/12	0.0	0.0	0.0	21.0
		01/08/13	0.0	0.0	0.0	20.9
		02/07/13	NM	0.0	0.0	20.8
		03/08/13	NM	0.0	0.0	21.0
		04/08/13	0.0	0.0	0.0	20.9
		05/08/13	0.0	0.0	0.0	20.5
		06/13/13	0.0	0.0	0.0	20.5
		07/08/13	0.0	0.0	0.0	20.5
		08/14/13	0.0	0.1	0.0	20.6
		09/18/13	0.0	0.0	0.0	20.3
		10/09/13	0.0	0.1	0.0	21.2
		11/13/13	0.0	0.0	0.0	20.8
		12/19/13	0.0	0.0	0.0	21.2
		01/08/14	NM	NM	NM	NM
		02/03/14	NM	NM	NM	NM
		02/17/14	0.0	0.0	0.1	21.1
		03/17/14	0.0	0.0	0.0	21.6
		04/14/14	NM	NM	NM	NM
		05/22/14	0.0	0.0	0.0	20.6
		06/17/14	0.0	0.0	0.0	20.9
Ambient, Outdoor Air (near excavation area on subject site)		11/27/12	0.0	0.0	0.0	20.9
		01/08/13	0.0	0.0	0.0	20.9
		02/07/13	NM	0.0	0.0	21.5
		03/08/13	NM	0.0	0.0	20.9
		04/08/13	0.0	0.0	0.0	20.9
		05/08/13	0.0	0.0	0.0	20.4
		06/13/13	0.0	0.0	0.0	20.4
		07/08/13	0.0	0.0	0.0	20.4
		08/14/13	0.0	0.0	0.0	20.6
		09/11/13	0.0	0.0	0.0	20.3
		10/09/13	0.0	0.3	0.0	21.3
		11/13/13	0.0	0.0	0.0	22.1
		12/19/13	0.0	0.0	0.0	22.4
		01/08/14	0.0	0.2	0.2	20.6
		02/03/14	0.5	0.1	0.0	21.3
		02/17/14	0.0	0.0	0.1	21.3
		03/17/14	0.0	0.0	0.0	21.3
		04/14/14	0.0	0.0	0.0	21.2
		05/22/14	0.0	0.0	0.0	20.9
		06/17/14	0.0	0.0	0.0	20.9

Notes:
1. VOC concentrations measured using a photoionization detector (PID)
2. Methane, carbon dioxide, and oxygen concentrations measured using GEM 2000 multi-gas meter.
3. NM denotes not measured; NA denotes not available.
4. New sub-slab depressurization (SSD) systems were installed at the Triangle Family Church in May 2014. Subsequent readings are reported for the front fan/rear fan.

Table 2: Analytical Data for Indoor Air **ADT 2**

DSCA ID No.: 32-0013

Sample ID	Sampling Date (mm/dd/yy)	Sample Location [1]	Sampling Method [2]	Sampling Duration [3]	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl chloride
					[µg/m^3]				
1414 Watts St									
BG-1414	05/07/10		SU	6h	<0.0339	2.11	<0.0339	0.0162J	<0.0129
	05/14/10		P	7d	<0.24	2.1	<0.24	<0.14	<0.38
	03/17/11		P	7d	<0.15	0.36	<0.15	<0.092	<0.24
	11/11/12		SU	3h	<0.079	0.38	<0.079	<0.11	<0.051
1414-South	07/29/09	C	SU	3h	<34	**814**	<34	<45	<22
1414-Chase	03/17/11	C	P	7d	<0.15	31	<0.15	<0.092	<0.24
1414-Front	07/16/09	C	SU	1h	<3.2	**510**	<3.2	<4.3	<2.0
	07/29/09		SU	3h	<32	**692**	<32	<43	<21
	03/15/10		SU	6h	<0.0336	**163**	<95.5	0.0892	<0.0128
	04/09/10		SU	6h	<0.0348	**143**	<0.0348	0.0403J	<0.0132
	05/07/10		SU	6h	<0.0305	**90.4**	0.105	0.0740	<0.0116
	05/14/10		P	7d	<0.24	**89**	<0.24	<0.14	<0.38
	03/17/11		P	7d	<0.15	19	<0.15	<0.091	<0.24
	08/11/11		P	30d	<0.052	**100**	<0.052	<0.031	<0.084
	09/25/11		SU	3h	**1.7**	**55**	0.24	1.3	<0.051
	01/29/12		SU	3h	**0.48**	28	<0.079	0.42	<0.051
	04/22/12		SU	3h	**1.8**	5.4	<0.079	<0.11	<0.051
	11/11/12		SU	3h	<0.079	**320**	<0.079	<0.11	<0.051
	01/13/13		SU	3h	<0.079	**61**	<0.079	<0.11	<0.051
	07/28/13		SU	3h	0.33	**150**	<0.079	<0.11	<0.051
	09/15/13		SU	3h	<0.14	**66**	<0.14	<0.19	<0.090
	12/08/13		SU	3h	<0.14	**120**	<0.14	<0.19	<0.090
	02/23/14		SU	3h	<0.14	**91**	<0.14	<0.19	<0.090
	03/16/14		SU	3h	<0.14	**120**	<0.14	<0.19	<0.090
	04/13/14		SU	2h 45m	<0.14	11	<0.14	0.072J	<0.090
	05/25/14		SU	2h 6m	<0.14	1.9	<0.14	<0.19	<0.090
	06/22/14		SU	3 h 10 min	<0.14	2.8	<0.14	<0.19	<0.090
1414-Rear	07/29/09	C	SU	3h	<35	**841**	<35	<47	<22
	12/28/09		SU	6h	<0.191	**99**	<0.20	<0.395	<0.21
	03/15/10		SU	6h	<0.0345	**181**	<0.0345	0.0870	<0.0131
	04/09/10		SU	6h	<0.0336	**213**	<0.0336	0.0785	<0.0128
	05/07/10		SU	6h	<0.0344	**104**	0.0978	0.0717	<0.0131
	05/14/10		P	7d	<0.24	**120**	<0.24	<0.14	<0.38
	03/17/11		P	7d	<0.15	30	<0.15	<0.092	<0.24
	08/11/11		P	30d	<0.052	**110**	<0.052	<0.031	<0.084
	09/25/11		SU	3h	1.4	**95**	<0.079	0.17	<0.051
	01/29/12		SU	3h	2.6	**81**	<0.079	<0.11	<0.051
	04/22/12		SU	3h	1.2	25	<0.079	<0.11	<0.051
	11/11/12		SU	3h	<0.079	**190**	<0.079	<0.11	<0.051
	01/13/13		SU	3h	<0.079	**180**	<0.079	<0.11	<0.051
	07/28/13		SU	3h	0.29	**240**	<0.079	<0.11	<0.051
	09/15/13		SU	3h	<0.14	**210**	<0.14	0.057 J	<0.090
	12/08/13		SU	3h	<0.14	**280**	<0.14	0.068 J	<0.090
	02/23/14		SU	3h 5m	<0.14	**160**	<0.14	<0.19	<0.090
	03/16/14		SU	3h	<0.14	**180**	<0.14	<0.19	<0.090
	04/13/14		SU	2h 55m	<0.14	**43**	<0.14	<0.19	<0.090
	05/25/14		SU	2h 1m	<0.14	2.2	<0.14	<0.19	<0.090
	06/22/14		SU	3 h	<0.14	4.1	<0.14	<0.19	<0.090

Table 2: Analytical Data for Indoor Air **ADT 2**

DSCA ID No.: 32-0013

Sample ID	Sampling Date (mm/dd/yy)	Sample Location [1]	Sampling Method [2]	Sampling Duration [3]	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl chloride
					[µg/m^3]				
1419 Dollar Ave									
1419-SUMP	03/30/10	R	SU	24h	<0.0310	0.581	<0.0310	0.0318J	<0.0142
BG-1419	03/30/10		SU	24h	<0.0332	0.369	<0.0332	0.0198J	<0.0126
	01/07/11		SU	24h	<0.079	1.0	<0.079	<0.11	<0.051
	01/07/11		P	24h	<1.7 C	<1.2	<1.7	<1.0	<2.7
	03/14/11		P	30d	<0.060 C	0.35	<0.060 C	<0.036	<0.096 C
	04/14/11		P	28d	<0.060 C	0.42	<0.060 C	<0.036	<0.096 C
	12/05/12		P	30d	<0.077 C	1.2	<0.080 C	<0.035	<0.11 C
	02/01/13		P	30d	<0.074 C	0.49	<0.077 C	<0.034	<0.10 C
1419-OUT	06/02/14		P	14d	<0.16 C	1.4	<0.16 C	<0.072	<0.22 C
1419-UP	10/15/09	R	SU	24h	<1.1	1.2J	<1.1	<1.5	<0.7
	11/10/09		SU	24h	3.73	**16.3**	<5.15	**7.52**	<1.74
	11/16/09		SU	24h	0.276	**9.15**	<0.04	0.07J	<0.0153
	11/24/09		SU	24h	4.36	**21.69**	<5.15	**5.91**	<1.74
	12/28/09		SU	24h	<0.040	3.13	<0.0749	0.193J	<0.0141
	03/30/10		SU	24h	0.512	2.71	<0.0324	0.0501	<0.0123
	01/07/11		SU	24h	<0.079	4.8	<0.079	<0.11	<0.051
	01/07/11		P	24h	<1.7 C	5.2	<1.7 C	<1.0	<2.7 C
	03/14/11		P	30d	<0.060 C	3.1	<0.060 C	<0.036	<0.096 C
	04/14/11		P	28d	<0.060 C	4.8	<0.060 C	<0.036	<0.096 C
	10/05/11		P	34d	<0.049 C	5.8	<0.049 C	<0.029	<0.079 C
	02/13/12		P	30d	<0.060 C	6.7	<0.060 C	<0.036	<0.096 C
	05/16/12		SU	24h	<0.079	**17.0**	<0.079	<0.11	<0.051
	05/21/12		P	30d	<0.051 C	5.4	<0.051 C	<0.030	<0.082 C
	12/05/12		P	30d	<0.077 C	6.0	<0.080 C	<0.035	<0.11 C
	02/01/13		P	30d	<0.074 C	4.7	<0.077 C	<0.034	<0.10 C
	10/01/13		P	14d	<0.16 C	5.1	<0.17 C	<0.072	<0.22 C
	12/17/13		P	14d	<0.16 C	5.2	<0.17 C	<0.072	<0.22 C
	02/20/14		SU	24h	<0.14	4.8	<0.14	<0.19	<0.090
	03/06/14		P	14d	<0.12 C	5.7	<0.60 C	**1.4**	<0.077 C
	03/18/14		SU	24h	<0.14	2.2	<0.14	<0.19	<0.090
	04/01/14		P	14d	<0.12	6.5	<0.60	**0.88**	<0.077
	04/15/14		SU	24h	<0.14	**9.6**	<0.14	<0.19	<0.090
	04/29/14		P	14d	<0.12 C	6.2	<0.60 C	**1.2**	<0.077 C
	06/02/14		P	14d	<0.16 C	0.66	<0.16 C	<0.072	<0.22 C

Table 2: Analytical Data for Indoor Air **ADT 2**

DSCA ID No.: 32-0013

Sample ID	Sampling Date (mm/dd/yy)	Sample Location [1]	Sampling Method [2]	Sampling Duration [3]	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl chloride
					[µg/m^3]				
1419-DOWN	10/15/09	R	SU	24h	<1.1	6.1	<1.1	<1.5	<0.7
	11/10/09		SU	24h	<55.09	**54.2**	<106.21	**63.39J**	<35.006
	11/16/09		SU	24h	0.165	**8.47**	<0.0346	0.0468J	<0.014
	11/24/09		SU	24h	4.4	**18**	<5.15	**5.9**	<1.74
	12/28/09		SU	24h	<0.03	1.78	<0.030	0.021J	<0.0114
	03/30/10		SU	24h	<0.0347	2.83	<0.0347	0.0219J	<0.0132
	01/07/11		SU	24h	<0.079	5.2	<0.079	<0.11	<0.051
	01/07/11		P	24h	<1.7 C	5.7	<1.7 C	<1.0	<2.7 C
	03/14/11		P	30d	<0.060 C	6.6	<0.060 C	<0.036	<0.096 C
	04/14/11		P	28d	<0.060 C	**8.6**	<0.060 C	<0.036	<0.096 C
	10/05/11		P	34d	<0.049 C	**12**	<0.049 C	<0.029	<0.079 C
	02/13/12		P	30d	<0.060 C	5.1	<0.060 C	<0.036	<0.096 C
	05/16/12		SU	24h	<0.079	**12**	<0.079	<0.11	<0.051
	05/21/12		P	30d	<0.051 C	**10**	<0.051 C	<0.030	<0.082 C
	12/05/12		P	30d	<0.077 C	7.3	<0.080 C	<0.035	<0.11 C
	02/01/13		P	30d	<0.074 C	6.3	<0.077 C	<0.034	<0.10 C
	10/01/13		P	14d	<0.16 C	6.1	<0.17 C	<0.072	<0.22 C
	12/17/13		P	14d	<0.16 C	6.2	<0.17 C	<0.072	<0.22 C
	02/20/14		SU	24h	<0.14	**9.8**	<0.14	<0.19	<0.090
	03/06/14		P	14d	<0.12 C	7.7	<0.60 C	<0.14	<0.077 C
	03/18/14		SU	24h	<0.14	2.0	<0.14	<0.19	<0.090
	04/01/14		P	14d	<0.12	5.5	<0.60	<0.14	<0.077
	04/15/14		SU	24h	<0.14	**24**	<0.14	<0.19	<0.090
	04/29/14		P	14d	<0.12 C	5.9	<0.60 C	<0.14	<0.077 C
	06/02/14		P	14d	<0.16 C	0.77	<0.16 C	<0.072	<0.22 C
1421 Dollar Ave									
BG-1421	03/02/10		SU	24h	<0.0270	0.0626	<0.0270	0.0109J	<0.0103
1421-OUT	06/02/14		P	14d	<0.16 C	1.4	<0.16 C	<0.072	<0.22 C

Table 2: Analytical Data for Indoor Air **ADT 2**

DSCA ID No.: 32-0013

Sample ID	Sampling Date (mm/dd/yy)	Sample Location [1]	Sampling Method [2]	Sampling Duration [3]	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl chloride
					[µg/m^3]				
	10/06/09		SU	24h	<1.1	4.70	<1.1	<1.5	<1.8653
	11/10/09		SU	24h	<2.93	6.24	<5.55	**8.59**	<1.8653
	11/16/09		SU	24h	0.14	2.23	<0.03	0.045J	<0.01265
	11/24/09		SU	24h	4.76	**10.85**	<5.15	**8.06**	<1.738
	12/28/09		SU	24h	<0.0345	0.64	<0.0345	0.03J	0.01661J
	01/13/10		SU	24h	<0.029	0.98	<0.029	0.0334J	<0.011
	03/02/10		SU	24h	<0.0297	0.564	<0.0297	0.0125J	<0.0113
	06/03/10		SU	24h	<0.0352	1.07	<0.0352	0.0302J	<0.0134
	01/07/11		SU	24h	0.36	2.2	<0.079	<0.11	<0.051
	01/07/11		P	24h	<1.7 C	2.3	<1.7 C	<1.0	<2.7 C
	04/14/11		P	28d	<0.049 C	3.7	<0.049 C	<0.029	<0.079 C
	02/13/12		P	30d	<0.060 C	1.1	<0.060 C	<0.036	<0.096 C
1421-UP	05/16/12	R	SU	24h	0.75	2.5	<0.079	<0.11	<0.051
	05/21/12		P	30d	<0.054 C	1.6	<0.054 C	<0.032	<0.087 C
	12/05/12		P	30d	<0.077 C	6.7	<0.080 C	<0.035	<0.110 C
	02/01/13		P	30d	<0.074 C	2.1	<0.077 C	<0.034	<0.100 C
	09/19/13		P	13.3 d	<0.17 C	7.2	<0.17 C	<0.076	<0.23 C
	12/17/13		P	14 d	<0.16 C	**13**	<0.17 C	<0.072	<0.22 C
	02/25/14		SU	24h	<0.14	1.3	<0.14	<0.19	<0.090
	03/11/14		P	14d	<0.12 C	1.7	<0.60 C	**1.0**	<0.077 C
	03/18/14		SU	24h	<0.14	0.47	<0.14	<0.19	<0.090
	04/01/14		P	14d	<0.12	1.1	<0.60	**0.98**	<0.077
	04/22/14		SU	24h	<0.14	1.9	<0.14	<0.19	<0.090
	05/06/14		P	14d	0.37	2.0	<0.60 C	**0.47**	<0.077 C
	06/02/14		P	14d	<0.16 C	1.6	<0.16 C	<0.072	<0.22 C
	10/06/09		SU	24h	<21.7	**86.4**	<21.7	**18.9J**	<13.9
	11/10/09		SU	24h	<2.77	**9.5**	<5.15	<3.8	<1.738
	11/16/09		SU	24h	0.07	3.32	<0.03	0.0430J	<0.0128
	11/24/09		SU	24h	3.84	**11.53**	<5.15	**7.0**	<1.738
	12/28/09		SU	24h	<0.033	0.71	<0.033	0.0215J	0.01536J
	01/13/10		SU	24h	<0.0298	1.32	<0.030	0.0327J	<0.01132
	03/02/10		SU	24h	<0.0279	0.927	<0.0279	0.0119J	<0.0106
	06/03/10		SU	24h	<0.0348	2.44	<0.035	0.0184	<0.01324
	01/07/11		SU	24h	0.11	2.9	<0.079	<0.11	<0.051
	01/07/11		P	24h	<1.7 C	3.5	<1.7	<1.0	<2.7
	04/14/11		P	28d	<0.049 C	7.0	<0.049 C	<0.029	<0.079 C
	02/13/12		P	30d	<0.060 C	1.9	<0.060 C	<0.036	<0.096 C
1421-DOWN	05/16/12	R	SU	24h	0.21	5.6	<0.079	<0.11	<0.051
	05/21/12		P	30d	<0.054 C	4.3	<0.054 C	<0.032	<0.087 C
	12/05/12		P	30d	<0.077 C	**11**	<0.080 C	<0.035	<0.110 C
	02/01/13		P	30d	<0.074 C	3.5	<0.077 C	<0.034	<0.100 C
	09/19/13		P	13.3 d	<0.17 C	**13**	<0.17 C	<0.076	<0.23 C
	12/17/13		P	14 d	<0.16 C	**27**	<0.17 C	<0.072	<0.22 C
	02/25/14		SU	24h	<0.14	1.9	<0.14	<0.19	<0.090
	03/11/14		P	14d	<0.12 C	2.6	<0.60 C	**26**	<0.077 C
	03/18/14		SU	24h	<0.14	0.41	<0.14	<0.19	<0.090
	04/01/14		P	14d	<0.12	1.7	<0.60	<0.14	<0.077
	04/22/14		SU	24h	<0.14	4.8	<0.14	<0.19	<0.090
	05/06/14		P	14d	<0.12 C	2.4	<0.60 C	<0.14	<0.077 C
	06/02/14		P	14d	<0.16 C	3.6	<0.16 C	<0.072	<0.22 C

Table 2: Analytical Data for Indoor Air **ADT 2**

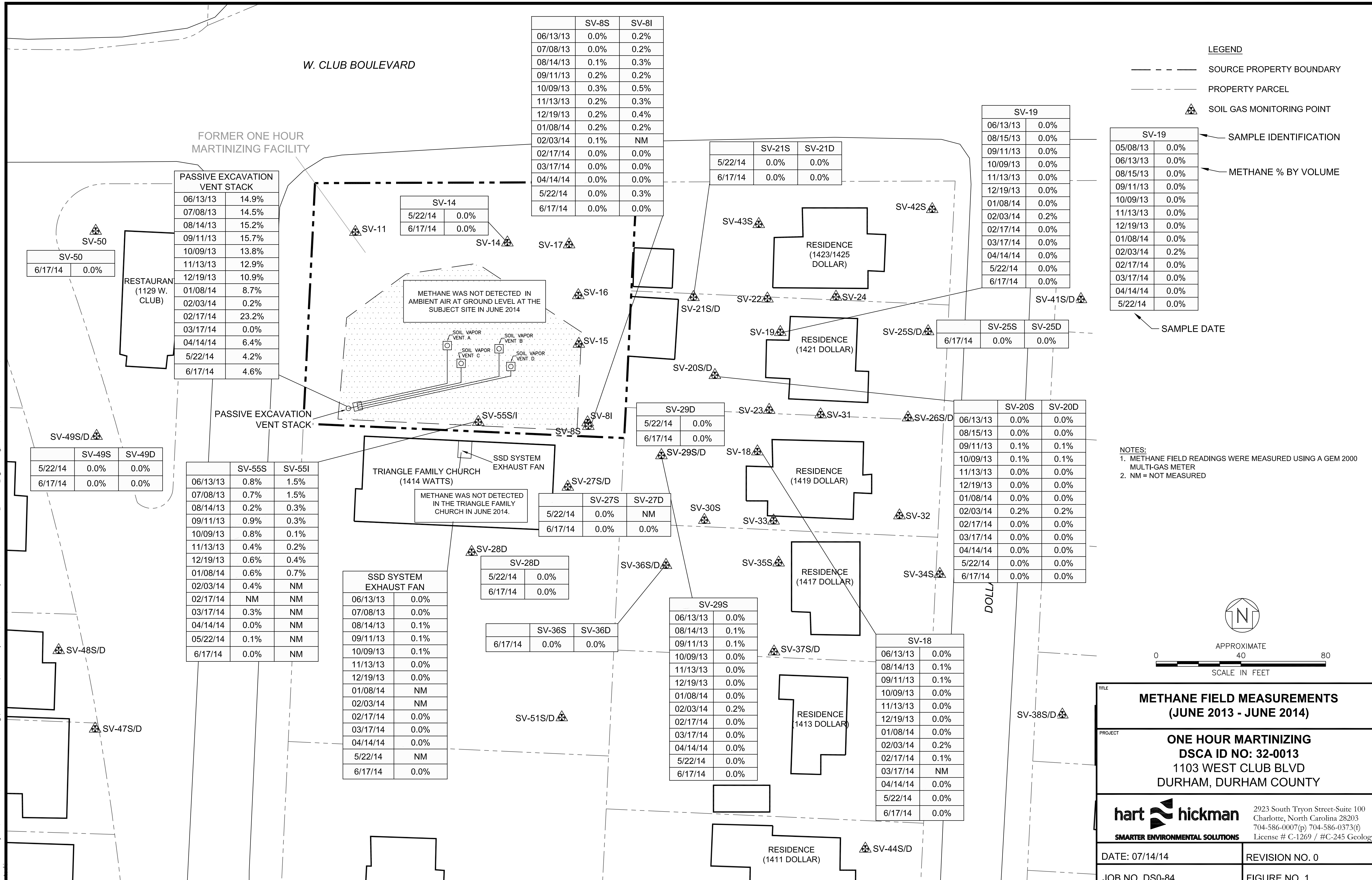
DSCA ID No.: 32-0013

Sample ID	Sampling Date (mm/dd/yy)	Sample Location [1]	Sampling Method [2]	Sampling Duration [3]	cis-1,2-Dichloroethylene	Tetrachloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl chloride
					[µg/m^3]				
DWM Residential IASLs					NE	8.34	12.6	0.43	0.16
DWM Non-Residential IASLs					NE	35.1	52	1.76	2.8

Notes:

1. "C" denotes commercial space; "R" denotes residence.
2. "SU" denotes Summa canister. "P" denotes passive sampler.
3. **Bold** exceeds DWM Non-Residential Indoor Air Screening Levels (IASLs) for 1414 Watts St samples and Residential IASLs for 1419 and 1421 Dollar Ave samples.
4. NA = Not Analyzed; NE = Not Established
5. J denotes estimated concentration between laboratory reporting limit and method detection limit.
6. Additional vapor mitigation measurese were completed at 1414 Watts St, 1419 Dollar Ave and 1421 Dollar Ave on May 12, 2014.

FIGURES



	SV-8S	SV-8I
06/13/13	0.0%	0.2%
07/08/13	0.0%	0.2%
08/14/13	0.1%	0.3%
09/11/13	0.2%	0.2%
10/09/13	0.3%	0.5%
11/13/13	0.2%	0.3%
12/19/13	0.2%	0.4%
01/08/14	0.2%	0.2%
02/03/14	0.1%	NM
02/17/14	0.0%	0.0%
03/17/14	0.0%	0.0%
04/14/14	0.0%	0.0%
5/22/14	0.0%	0.3%
6/17/14	0.0%	0.0%

PASSIVE EXCAVATION VENT STACK	
06/13/13	14.9%
07/08/13	14.5%
08/14/13	15.2%
09/11/13	15.7%
10/09/13	13.8%
11/13/13	12.9%
12/19/13	10.9%
01/08/14	8.7%
02/03/14	0.2%
02/17/14	23.2%
03/17/14	0.0%
04/14/14	6.4%
5/22/14	4.2%
6/17/14	4.6%

SV-14	
5/22/14	0.0%
6/17/14	0.0%

SV-50	
6/17/14	0.0%

	SV-21S	SV-21D
5/22/14	0.0%	0.0%
6/17/14	0.0%	0.0%

SV-19	
06/13/13	0.0%
08/15/13	0.0%
09/11/13	0.0%
10/09/13	0.0%
11/13/13	0.0%
12/19/13	0.0%
01/08/14	0.0%
02/03/14	0.2%
02/17/14	0.0%
03/17/14	0.0%
04/14/14	0.0%
5/22/14	0.0%
6/17/14	0.0%

SV-19	
05/08/13	0.0%
06/13/13	0.0%
08/15/13	0.0%
09/11/13	0.0%
10/09/13	0.0%
11/13/13	0.0%
12/19/13	0.0%
01/08/14	0.0%
02/03/14	0.2%
02/17/14	0.0%
03/17/14	0.0%
04/14/14	0.0%
5/22/14	0.0%

	SV-25S	SV-25D
6/17/14	0.0%	0.0%

	SV-20S	SV-20D
06/13/13	0.0%	0.0%
08/15/13	0.0%	0.0%
09/11/13	0.1%	0.1%
10/09/13	0.1%	0.1%
11/13/13	0.0%	0.0%
12/19/13	0.0%	0.0%
01/08/14	0.0%	0.0%
02/03/14	0.2%	0.2%
02/17/14	0.0%	0.0%
03/17/14	0.0%	0.0%
04/14/14	0.0%	0.0%
5/22/14	0.0%	0.0%
6/17/14	0.0%	0.0%

SV-29D	
5/22/14	0.0%
6/17/14	0.0%

	SV-49S	SV-49D
5/22/14	0.0%	0.0%
6/17/14	0.0%	0.0%

	SV-55S	SV-55I
06/13/13	0.8%	1.5%
07/08/13	0.7%	1.5%
08/14/13	0.2%	0.3%
09/11/13	0.9%	0.3%
10/09/13	0.8%	0.1%
11/13/13	0.4%	0.2%
12/19/13	0.6%	0.4%
01/08/14	0.6%	0.7%
02/03/14	0.4%	NM
02/17/14	NM	NM
03/17/14	0.3%	NM
04/14/14	0.0%	NM
05/22/14	0.1%	NM
6/17/14	0.0%	NM

	SV-27S	SV-27D
5/22/14	0.0%	NM
6/17/14	0.0%	0.0%

SV-28D	
5/22/14	0.0%
6/17/14	0.0%

SSD SYSTEM EXHAUST FAN	
06/13/13	0.0%
07/08/13	0.0%
08/14/13	0.1%
09/11/13	0.1%
10/09/13	0.1%
11/13/13	0.0%
12/19/13	0.0%
01/08/14	NM
02/03/14	NM
02/17/14	0.0%
03/17/14	0.0%
04/14/14	0.0%
5/22/14	NM
6/17/14	0.0%

	SV-36S	SV-36D
6/17/14	0.0%	0.0%

SV-29S	
06/13/13	0.0%
08/14/13	0.1%
09/11/13	0.1%
10/09/13	0.0%
11/13/13	0.0%
12/19/13	0.0%
01/08/14	0.0%
02/03/14	0.2%
02/17/14	0.0%
03/17/14	0.0%
04/14/14	0.0%
5/22/14	0.0%
6/17/14	0.0%

SV-18	
06/13/13	0.0%
08/14/13	0.1%
09/11/13	0.1%
10/09/13	0.0%
11/13/13	0.0%
12/19/13	0.0%
01/08/14	0.0%
02/03/14	0.2%
02/17/14	0.1%
03/17/14	NM
04/14/14	0.0%
5/22/14	0.0%
6/17/14	0.0%

NOTES:
1. METHANE FIELD READINGS WERE MEASURED USING A GEM 2000 MULTI-GAS METER
2. NM = NOT MEASURED

TITLE
METHANE FIELD MEASUREMENTS (JUNE 2013 - JUNE 2014)

PROJECT
ONE HOUR MARTINIZING DSCA ID NO: 32-0013
1103 WEST CLUB BLVD
DURHAM, DURHAM COUNTY

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

DATE: 07/14/14 | REVISION NO. 0
JOB NO. DS0-84 | FIGURE NO. 1

W. CLUB BOULEVARD

FORMER ONE HOUR MARTINIZING FACILITY

RESTAURANT (1129 W. CLUB)

1421-UP	06/02/14
PCE	1.6
TCE	<0.072

RESIDENCE (1423/1425 DOLLAR)

1421-OUT	06/02/14
PCE	1.4
TCE	<0.072

1421-OUT

1421-UP

RESIDENCE (1421 DOLLAR)

1421-DOWN

1421-DOWN	06/02/14
PCE	3.6
TCE	<0.072

1419-UP	06/02/14
PCE	0.66
TCE	<0.072

1419-UP

RESIDENCE (1419 DOLLAR)

1419-DOWN

1419-DOWN	06/02/14
PCE	0.77
TCE	<0.072

1414-FRONT

TRIANGLE FAMILY CHURCH (1414 WATTS)

1414-REAR

1414-FRONT	05/25/14	06/22/14
PCE	1.9	2.8
TCE	<0.19	<0.19

1414-REAR	05/25/14	06/22/14
PCE	2.2	4.1
TCE	<0.19	<0.19

1419-OUT

1419-OUT	06/02/14
PCE	1.4
TCE	<0.072

WATTS STREET

DOLLAR AVENUE

RESIDENCE (1417 DOLLAR)

RESIDENCE (1413 DOLLAR)

RESIDENCE (1411 DOLLAR)

LEGEND

- SOURCE PROPERTY BOUNDARY
- PROPERTY PARCEL
- INDOOR OR OUTDOOR AIR SAMPLE

SAMPLE IDENTIFICATION

SAMPLE DATE

1414-REAR	05/25/14	06/22/14
PCE	2.2	4.1
TCE	<0.19	<0.19

CONCENTRATION (µg/m³)

CONSTITUENT

NOTES:

1. INDOOR AIR SAMPLES FROM 1414 WATTS ST WERE COLLECTED USING SUMMA CANISTERS OVER A 2- TO 3-HR PERIOD.
2. INDOOR AIR SAMPLES FROM 1419 AND 1421 DOLLAR WERE COLLECTED USING PASSIVE RADIELLO SAMPLERS DEPLOYED FOR 14 DAYS.
3. **BOLD** CONCENTRATIONS EXCEED DIVISION OF WASTE MANAGEMENT RESIDENTIAL OR NON-RESIDENTIAL INDOOR AIR SCREENING LEVELS.
4. J FLAG DENOTES ESTIMATED CONCENTRATION BETWEEN LABORATORY REPORTING LIMIT AND METHOD DETECTION LIMIT.
5. MAY AND JUNE 2014 DATA ARE SHOWN FOR 1414 WATTS ST. ONLY MAY 2014 DATA (COLLECTED FROM MAY 19 TO JUNE 2) ARE SHOWN FOR 1419 AND 1421 DOLLAR AVENUE.

N

APPROXIMATE

0 40 80

SCALE IN FEET

TITLE

INDOOR AIR CONTAMINANT CONCENTRATION MAP (MAY AND JUNE 2014)

PROJECT

ONE HOUR MARTINIZING
DSCA ID NO: 32-0013
1103 WEST CLUB BLVD
DURHAM, DURHAM COUNTY

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

DATE: 07/14/14 | REVISION NO. 0

JOB NO. DS0-84 | FIGURE NO. 2

S:\AAA-Master Projects\DSCA - DS0\DS0-84 One Hr Martinizing (former BB&T)\Website Updates\2014 Website Updates\June 2014\DC320013_20140613_Figures.dwg, Indoor Air, 7/14/2014 12:53:34 PM,

ATTACHMENT A

PROJECT CALENDAR

~ March 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	3	4	5	6	7	8
	14-Day Radiello Indoor Air Sampling at 1419 Dollar Ave					
	14-Day Radiello Indoor Air Sampling at 1421 Dollar Ave					
9	10	11	12	13	14	15
	14-Day Radiello Indoor Air Sampling at 1421 Dollar Ave					
16	17	18	19	20	21	22
3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St	**24-Hour Summa Canister Indoor Air Sampling at 1419 & 1421 Dollar Ave**					
	Methane Field Screening	**14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave**				
23	24	25	26	27	28	29
	Post–Injection Groundwater and Soil Vapor Sampling					
	14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave					
30	31					
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						

Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.

~ April 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St

24-Hour Summa Canister Indoor Air Sampling at 1419 Dollar Ave

Methane Field Screening

14-Day Radiello Indoor Air Sampling at 1419 Dollar Ave

14-Day Radiello Indoor Air Sampling at 1421 Dollar Ave

24-Hour Summa Canister Indoor Air Sampling at 1421 Dollar

Post–Injection Groundwater and Soil Vapor Sampling

14-Day Radiello Indoor Air Sampling at 1419 Dollar Ave

14-Day Radiello Indoor Air Sampling at 1419 Dollar Ave

14-Day Radiello Indoor Air Sampling at 1421 Dollar Ave

Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.

~ May 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.				1	2	3
				14-Day Radiello Indoor Air Sampling at 1421 Dollar Ave		
4	5	6	7	8	9	10
14-Day Radiello Indoor Air Sampling at 1421 Dollar Ave			**Install Vapor Mitigation Systems at 1414 Watts St, 1419 & 1421 Dollar Ave**			
11	12	13	14	15	16	17
	Install Vapor Mitigation Systems at 1414 Watts St, 1419 & 1421 Dollar Ave					
18	19	20	21	22	23	24
				Methane Field Screening		
	14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave					
25	26	27	28	29	30	31
3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St						
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						

~ June 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						
8	9	10	11	12	13	14
15	16	17	18	19	20	21
3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St		**Methane Field Screening**				
		14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave				
22	23	24	25	26	27	28
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						
29	30					
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						

Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.

~ July 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Post–Injection Groundwater and Soil Vapor Sampling (7 – 11)

3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St (13)

Methane Field Screening (15)

14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave (15 – 26)

14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave (20 – 28)

Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.

~ August 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

~ September 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.

~ October 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.			1	2	3	4
5	6	7	8	9	10	11
	Post–Injection Groundwater and Soil Vapor Sampling					
12	13	14	15	16	17	18
3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St		**Methane Field Screening**				
		14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave				
19	20	21	22	23	24	25
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						
26	27	28	29	30	31	
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						

~ November 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23 30	24	25	26	27	28	29

~ December 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.		

~ January 2015 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.				1	2	3
4	5	6	7	8	9	10
	Post–Injection Groundwater and Soil Vapor Sampling					
11	12	13	14	15	16	17
3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St		**Methane Field Screening**				
		14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave				
18	19	20	21	22	23	24
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						
25	26	27	28	29	30	31
14-Day Radiello Indoor Air Sampling at 1419 & 1421 Dollar Ave						

ATTACHMENT B

INDOOR AIR RISK CALCULATORS

Calculated Cumulative Indoor Air Risks (June 2014)
Triangle Family Church, 1414 Watts Street, Durham, NC
One Hour Martinizing Site, DSCA ID 32-0013
H&H Job No. DS0-84

Risk Exposure Scenario: Residential exposure based on 6 hrs per week occupancy (typical parishioner)

Cumulative Carcinogenic Risk								
Unit	**Compound**	**Exposure Conc. ug/m^3**	**IUR $(ug/m^3)^{-1}$**	**AT days**	**EF days/yr**	**ED years**	**ET hr/day**	**LICR**
1414-Front	Tetrachloroethene	2.8	2.60E-07	25550	208	30	1.500	0.00000001
							Total	**1.1E-08**
1414-Rear	Tetrachloroethene	4.1	2.60E-07	25550	208	30	1.500	0.00000002
							Total	**1.6E-08**

Cumulative Non-Carcinogenic Risk								
Unit	**Compound**	**Exposure Conc. ug/m^3**	**Rfc mg/m^3**	**AT days**	**EF days/yr**	**ED years**	**ET hr/day**	**Hazard Index**
1414-Front	Tetrachloroethene	2.8	4.00E-02	10950	208	30	1.5	0.00249315
							Total	**0.0025**
1414-Rear	Tetrachloroethene	4.1	4.00E-02	10950	208	30	1.5	0.00365068
							Total	**0.0037**

Notes:
IUR and Rfc concentrations from EPA Regional Screening Level (RSL) Residential Air Table, May 2014.
LICR = Lifetime Incremental Cancer Risk
AT = Averaging Time
IUR = Inhalation Unit Rate
Rfc = Reference Concentration
EF = Exposure Frequency
ED = Exposure Duration
ET = Exposure Time

DSCA Indoor Air Risk Calculator - Cumulative Risk for Resident

Version 2, 6/24/2014

DSCA ID No:	32-0013
Name/Address of DSCA Site:	One Hour Martinizing, 1103 West Club Blvd, Durham, NC
Name/Address of Sampling Location:	Drey Residence, 1419 Dollar Ave, Durham, NC
Sampling Date:	6/2/2014
Sample ID:	1419-DOWN

CAS	Chemical Name	Indoor Air Concentration (ug/m^3)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06 (ug/m3)	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2 (ug/m3)	Calculated Carcinogenic Risk (CR)	Calculated Non-Carcinogenic Hazard Quotient (HI)
127-18-4	Tetrachloroethylene	0.77	1.08E+01	8.34E+00	7.13E-08	0.0185
			Cumulative:		7.13E-08	0.02

Notes:

1. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.

2. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

$CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)] \times 10^{-6}$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on carcinogenic risk of 10^{-6}

$HI = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)]$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on hazard quotient of 1*

* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.

DSCA Indoor Air Risk Calculator - Cumulative Risk for Resident

Version 2, 6/24/2014

DSCA ID No:	32-0013
Name/Address of DSCA Site:	One Hour Martinizing, 1103 West Club Blvd, Durham, NC
Name/Address of Sampling Location:	Drey Residence, 1419 Dollar Ave, Durham, NC
Sampling Date:	6/2/2014
Sample ID:	1419-UP

CAS	Chemical Name	Indoor Air Concentration (ug/m^3)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06 (ug/m3)	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2 (ug/m3)	Calculated Carcinogenic Risk (CR)	Calculated Non-Carcinogenic Hazard Quotient (HI)
127-18-4	Tetrachloroethylene	0.66	1.08E+01	8.34E+00	6.11E-08	0.0158
			Cumulative:		6.11E-08	0.02

Notes:

1. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.

2. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

$CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)] \times 10^{-6}$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on carcinogenic risk of 10^{-6}

$HI = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)]$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on hazard quotient of 1*

* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.

DSCA Indoor Air Risk Calculator - Cumulative Risk for Resident

Version 2, 6/24/2014

DSCA ID No:	32-0013
Name/Address of DSCA Site:	One Hour Martinizing, 1103 West Club Blvd, Durham, NC
Name/Address of Sampling Location:	Gilligan Residence, 1421 Dollar Ave, Durham, NC
Sampling Date:	6/2/2014
Sample ID:	1421-DOWN

CAS	Chemical Name	Indoor Air Concentration (ug/m^3)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06 (ug/m3)	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2 (ug/m3)	Calculated Carcinogenic Risk (CR)	Calculated Non-Carcinogenic Hazard Quotient (HI)
127-18-4	Tetrachloroethylene	3.6	1.08E+01	8.34E+00	3.33E-07	0.0863
			Cumulative:		3.33E-07	0.09

Notes:

1. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.

2. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

$CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)] \times 10^{-6}$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on carcinogenic risk of 10^{-6}

$HI = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)]$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on hazard quotient of 1*

* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.

DSCA Indoor Air Risk Calculator - Cumulative Risk for Resident

Version 2, 6/24/2014

DSCA ID No:	32-0013
Name/Address of DSCA Site:	One Hour Martinizing, 1103 West Club Blvd, Durham, NC
Name/Address of Sampling Location:	Gilligan Residence, 1421 Dollar Ave, Durham, NC
Sampling Date:	6/2/2014
Sample ID:	1421-UP

CAS	Chemical Name	Indoor Air Concentration (ug/m^3)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06 (ug/m3)	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2 (ug/m3)	Calculated Carcinogenic Risk CR	Calculated Non-Carcinogenic Hazard Quotient HI
127-18-4	Tetrachloroethylene	1.6	1.08E+01	8.34E+00	1.48E-07	0.0384
			Cumulative:		1.48E-07	0.04

Notes:

1. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.

2. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

$CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)] \times 10^{-6}$

Where,

Conc = indoor air concentration for constituent of concern

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$HI = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)]$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on hazard quotient of 1*

* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.