

MEMORANDUM

To: Billy Meyer

From: Christie Zawtocky, PE
Timothy Klotz

Date: September 3, 2013

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. A brief summary of recently completed activities and upcoming activities is provided below.

Monthly Field Screening

On August 14, 2013, H&H completed a monthly field screening event at the site. 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 not above acceptable standards. Measurements were collected at the following locations:

- Soil Vapor Monitoring Points: SV-8S, SV-8I, SV-18S, SV-19S, SV-20S, SV-20D, SV-29S, SV-55S, SV-55I
- 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

The field screening data are summarized in the attached Table 1, and the methane readings are shown on the attached Figure 1. Recorded field measurements indicate that methane was detected in the sampled source property soil vapor points (SV-8S, SV-8I, SV-55S and SV-55I) and two off-source property soil vapor points (SV-18S and SV-29S) at low levels ranging from 0.1 to 0.3 % by volume. Very low methane levels (0.1 % by volume) were also detected in the sub-slab depressurization system exhaust and indoor air at the Triangle Family Church at 1414 Watts St. These methane readings are substantially below acceptable levels. Methane was detected in the vapors from the excavation passive exhaust vent at a level of 17.7 % by volume. 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 levels of methane. The monthly methane field readings generally appear to be stable or decreasing over time between January 2013 and August 2013.

VOCs were detected in each of the monitored soil vapor points. As expected, the highest VOC concentrations were detected in source property soil vapor points SV-8S (427 ppm) and SV-8I (165 ppm) located near the source excavation area. VOC concentrations in SV-8S and SV-8I appear to be decreasing over time as a result of the remedial activities. VOC concentrations in the soil vapor points located on off-source properties appear to be fluctuating over time, and the August 2013 VOC concentrations are within the range of fluctuations.

The next monthly field screening event is scheduled for September 11, 2013.

Monitoring Well Installation

In August 2013, H&H installed additional monitoring wells on the source property. The RAP included four monitoring wells that had not yet been installed at the site: MW-21S and MW-21I (near the southwest corner of the excavation area) and MW-23S and MW-23I (near the southeast corner of the excavation). The shallow wells (MW-21S and MW-23S) were designed to be screened across the water table, and the intermediate wells (MW-21I and MW-23I) were designed to be screened at the top of rock. The purpose of the monitoring wells is to provide sampling points for evaluating the effectiveness of the soil excavation and the planned injection activities in reducing source area groundwater concentrations.

On August 15 and 16, 2013, H&H installed the additional monitoring wells on the source property. MW-23S and MW-23I were installed as planned near the southeast corner of the excavation. MW-23S was screened across the water table from 20 to 35 ft below ground surface (bgs), and MW-23I was installed at a refusal depth of 60 ft bgs with 10 ft of screen from 50 to 60 ft bgs. Due to a shallow refusal depth of 32 ft bgs, only one monitoring well MW-21 was installed near the southwest corner of the excavation. This well was screened from 12 to 32 ft bgs. The monitoring well locations are depicted on Figure 2.

Groundwater Sampling

Between August 19 and 22, 2013, H&H conducted a groundwater sampling event at the site to evaluate current groundwater concentrations. H&H gauged water levels and collected groundwater samples from all monitoring wells associated with the site, except for MW-20S and MW-20I. The property owner at 1410 Watts St, where MW-20S and MW-20I are located, would not grant access for the sampling event. All of the samples were analyzed for volatile organic compounds (VOCs) to evaluate current concentrations of dry-cleaning related constituents. In addition, monitoring wells in the vicinity of the planned injection area were analyzed for additional parameters to evaluate groundwater conditions post-excavation/Daramend application and pre-injection of EHC. The monitoring wells listed below were monitored for pH, temperature, dissolved oxygen, conductivity, oxidation-reduction potential, methane, ethane, ethene, total organic carbon, and iron:

- Source property: MW-3R, MW-3I, MW-4R, MW-4I, MW-21S, MW-21I, MW-22S, MW-22I, MW-23S, and MW-23I
- West of source property: MW-10
- South of source property: MW-18
- East of source property: MW-14S, MW-14I, MW-16S, and MW-16I

The groundwater analytical data will be provided in the next monthly update. H&H will review the groundwater data to determine if any modifications are needed to the EHC injection plan to meet the intent of the RAP. If it is determined that modifications are needed, H&H will coordinate with the Underground Injection Control (UIC) Program.

Indoor Air Monitoring

H&H will continue quarterly indoor air monitoring at the three structures adjacent to the source property where vapor mitigation systems are in place (1419 Dollar St, 1421 Dollar St, and 1414 Watts St). The next quarterly sampling event is planned for September 2013. During the September sampling event, H&H will collect two 14-day Radiello samples from the 1419 and 1421 Dollar St residences and two 3-hour Summa canister indoor air samples from the Triangle Family Church at 1414 Watts St during the church's Sunday service. Please note that previous samples collected at 1419 and 1421 Dollar St were collected over a 30-day period and a 30-day sampling period is specified in the RAP. However, new information suggests the most optimal analytical results are obtained with 14-day samples. Thus, the sampling periods for the 1419 and 1421 Dollar St residences are being modified to 14 days. The indoor air samples will be submitted for laboratory analysis of tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride.

Injection of Adventus EHC

The RAP includes injection of Adventus EHC (a commercial remediation product that contains zero-valent iron and carbon) to treat shallow groundwater impacts at the source property. As indicated above, H&H plans to review the EHC injection plan after receiving the August 2013 groundwater sampling results to determine if any modifications (e.g., number of injection points, locations of injection points, volume of EHC injected, etc.) are needed to meet the intent of the RAP. H&H also plans to conduct some limited additional sampling with a direct-push technology rig on the source property on September 6, 2013 to further evaluate site conditions in preparation for the injection. Based on these results, H&H will proceed with planning and scheduling the injection activities. We anticipate completing the injection activities in November 2013.

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	5.00	11/27/12	427	0.1	1.7	20.0
		1/8/13	1,833	0.8	2.2	18.7
		2/7/13	NA	0.1	2.0	19.2
		3/8/13	NA	0.0	2.4	18.8
		4/8/13	465	0.0	2.4	17.7
		5/8/13	473	0.0	4.1	15.7
		6/13/13	360	0.0	5.7	13.7
		7/8/13	349	0.0	5.8	13.4
		8/14/13	427	0.1	5.4	15.6
SV-8I	17.00	11/27/12	>9,999	0.0	2.5	18.8
		1/8/13	2222	1.3	2.8	18.3
		2/7/13	NM	0.2	2.2	18.6
		3/8/13	NM	0.1	2.4	17.9
		4/8/13	4,098	0.2	1.8	17.6
		5/8/13	1,720	0.2	3.9	13.3
		6/13/13	248	0.2	1.8	16.5
		7/8/13	305	0.2	2.3	15.9
		8/14/13	165	0.3	2.1	15.6
SV-18S	5.00	11/27/12	22.3	0.0	2.5	19.2
		1/8/13	51.1	0.4	0.0	21.5
		2/7/13	NM	0.0	2.3	18.6
		3/8/13	NM	0.0	4.1	16.9
		4/8/13	2.1	0.0	2.5	18.1
		5/8/13	14.9	0.0	4.9	15.9
		6/13/13	20.7	0.0	4.7	16.2
		8/14/13	26.1	0.1	3.0	18.2
SV-19S	5.00	11/27/12	2.25	0.0	10.8	11.5
		1/8/13	4.50	0.6	9.1	13.3
		2/7/13	NM	0.0	8.6	13.9
		3/8/13	NM	0.0	8.3	13.5
		4/8/13	1.2	0.0	8.3	13.7
		5/8/13	0.9	0.0	9.1	13.0
		6/13/13	6.2	0.0	9.7	11.7
		8/15/13	4.4	0.0	9.2	12.1
SV-20S	5.00	11/27/12	75.5	0.0	6.3	16.1
		1/8/13	15.0	1.3	5.0	16.9
		2/7/13	NM	0.1	6.4	15.5
		3/8/13	NM	0.0	5.0	16.0
		4/8/13	47.4	0.0	5.2	15.3
		5/8/13	62.5	0.0	6.3	14.6
		6/13/13	64.0	0.0	7.7	13.1
		8/15/13	61.8	0.0	6.8	13.6

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-20D	20.00	1/8/13	11.10	0.4	7.6	15.2
		2/7/13	NM	0.1	6.7	15.6
		3/8/13	NM	0.0	6.8	14.9
		4/8/13	46.8	0.0	6.7	15.2
		5/8/13	61.4	0.0	5.8	15.1
		6/13/13	58.9	0.0	7.1	13.5
		8/15/13	60.1	0.0	6.6	14.1
SV-29S	5.00	11/27/12	344	0.0	1.9	19.9
		1/8/13	96.3	0.3	2.0	19.8
		2/7/13	NM	0.1	2.3	18.6
		3/8/13	NM	0.0	2.8	17.6
		4/8/13	235	0.0	2.6	17.2
		5/8/13	151	0.0	3.3	16.7
		6/13/13	197	0.0	3.6	16.2
		8/14/13	317	0.1	3.4	17.7
SV-55S	5.00	11/27/12	430	0.2	0.2	21.1
		1/8/13	295	4.1	3.0	14.7
		2/7/13	NM	2.1	2.8	14.6
		3/8/13	NM	1.8	3.1	14.0
		4/8/13	311	1.4	3.0	14.3
		5/8/13	290	1.1	3.9	13.3
		6/13/13	295	0.8	4.5	11.8
		7/8/13	258	0.7	4.9	11.1
SV-55I	17.00	8/14/13	133	0.2	1.8	17.8
		11/27/12	12	4.1	0.6	12.4
		1/8/13	442	3.6	2.0	12.1
		2/7/13	NM	1.4	2.9	14.8
		3/8/13	NM	1.6	3.5	14.6
		4/8/13	NM*			
		5/8/13	NM	1.6	2.7	10.7
		6/13/13	86.5	1.5	1.6	11.0
		7/8/13	NM	1.5	2.1	10.6
Vent Exhaust Pipe		8/14/13	26.7	0.3	0.2	16.5
		11/27/12	38.0	12.5	11.1	9.7
		1/8/13	173	11.0	9.3	10.6
		2/7/13	NM	17.3	15.9	1.5
		3/8/13	NM	16.4	15.0	1.7
		4/8/13	6.5	12.6	11.7	4.9
		5/8/13	10.8	15.0	14.4	1.9
		6/13/13	9.6	14.9	13.4	0.7
		7/8/13	9.6	14.5	13.0	0.8
8/14/13	17.7	15.2	14.5	1.7		

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	%	%	%
SSD System Triangle Family Church 1414 Watts Street		11/27/12	2.4	0.1	0.0	21.0
		1/8/13	159	1.0	0.0	21.1
		2/7/13	NM	0.2	0.0	21.4
		3/8/13	NM	0.0	0.0	20.8
		4/8/13	0.0	0.0	0.0	20.8
		5/8/13	0.0	0.0	0.0	20.6
		6/13/13	0.0	0.0	0.0	20.4
		7/8/13	0.0	0.0	0.0	20.5
		8/14/13	4.4	0.1	0.0	20.5
Indoor Air Triangle Family Church 1414 Watts Street		11/27/12	0.0	0.0	0.0	21.0
		1/8/13	0.0	0.0	0.0	20.9
		2/7/13	NM	0.0	0.0	20.8
		3/8/13	NM	0.0	0.0	21.0
		4/8/13	0.0	0.0	0.0	20.9
		5/8/13	0.0	0.0	0.0	20.5
		6/13/13	0.0	0.0	0.0	20.5
		7/8/13	0.0	0.0	0.0	20.5
		8/14/13	0.0	0.1	0.0	20.6
Ambient, Outdoor Air (near excavation area on subject site)		11/27/12	0.0	0.0	0.0	20.9
		1/8/13	0.0	0.0	0.0	20.9
		2/7/13	NM	0.0	0.0	21.5
		3/8/13	NM	0.0	0.0	20.9
		4/8/13	0.0	0.0	0.0	20.9
		5/8/13	0.0	0.0	0.0	20.4
		6/13/13	0.0	0.0	0.0	20.4
		7/8/13	0.0	0.0	0.0	20.4
		8/14/13	0.0	0.0	0.0	20.6

Notes:

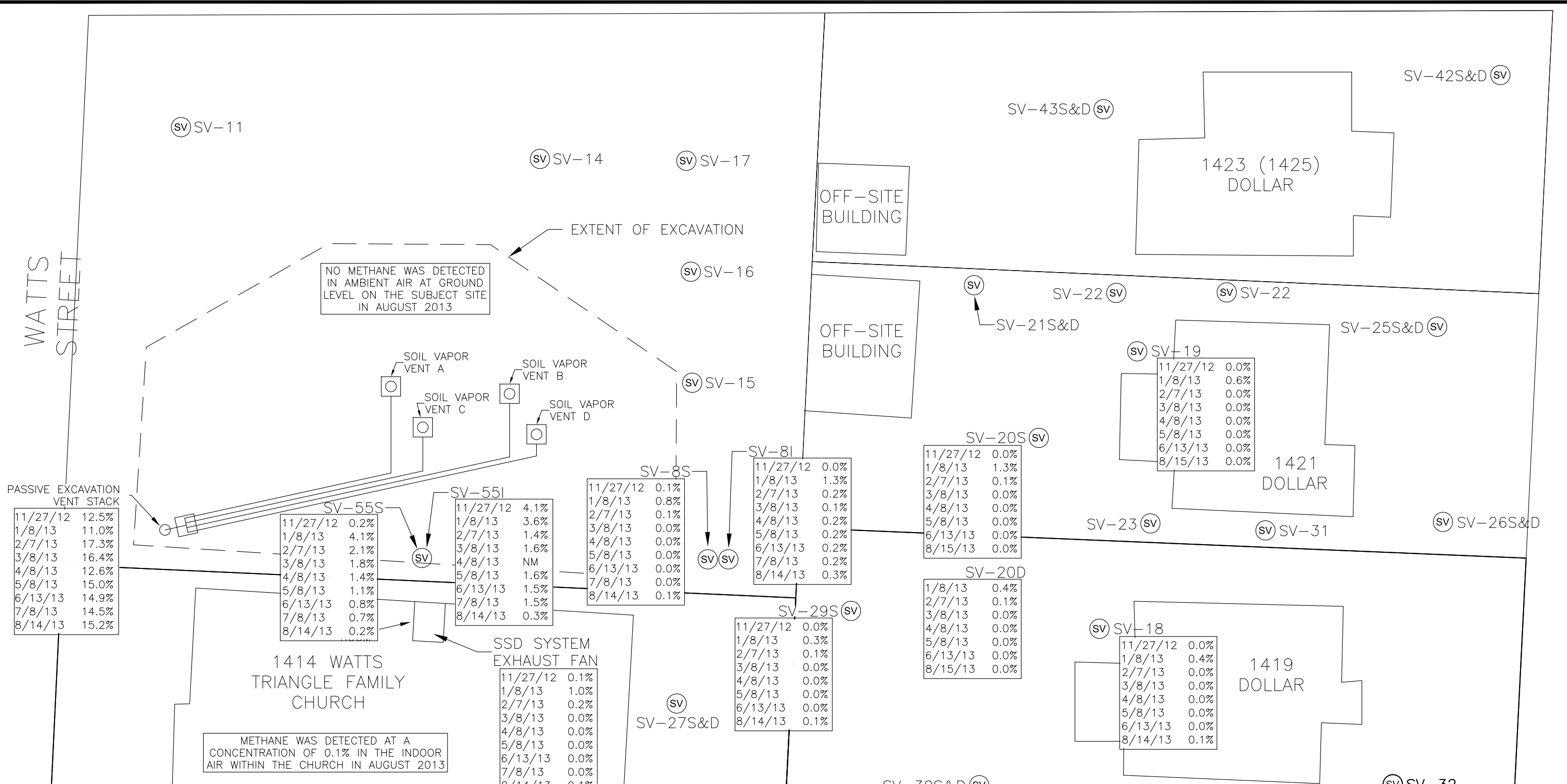
* = Water was present in soil vapor point SV-551 - little to no air flow

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.

S:\AAA-Master Projects\DSCA - DS0\DS0-84 One Hr Martinizing (former BB&T)\Figures\DC20013_20130802_Update\Figures-hh.dwg, SV Methane



11/27/12	12.5%
1/8/13	11.0%
2/7/13	17.3%
3/8/13	16.4%
4/8/13	12.6%
5/8/13	15.0%
6/13/13	14.9%
7/8/13	14.5%
8/14/13	15.2%

11/27/12	0.2%
1/8/13	4.1%
2/7/13	2.1%
3/8/13	1.8%
4/8/13	1.4%
5/8/13	1.1%
6/13/13	0.8%
7/8/13	0.7%
8/14/13	0.2%

11/27/12	4.1%
1/8/13	3.6%
2/7/13	1.4%
3/8/13	1.6%
4/8/13	NM
5/8/13	1.6%
6/13/13	1.5%
7/8/13	1.5%
8/14/13	0.3%

11/27/12	0.1%
1/8/13	0.8%
2/7/13	0.1%
3/8/13	0.0%
4/8/13	0.0%
5/8/13	0.0%
6/13/13	0.0%
7/8/13	0.0%
8/14/13	0.1%

11/27/12	0.0%
1/8/13	1.3%
2/7/13	0.2%
3/8/13	0.1%
4/8/13	0.2%
5/8/13	0.2%
6/13/13	0.2%
7/8/13	0.2%
8/14/13	0.3%

11/27/12	0.0%
1/8/13	1.3%
2/7/13	0.1%
3/8/13	0.0%
4/8/13	0.0%
5/8/13	0.0%
6/13/13	0.0%
8/15/13	0.0%

11/27/12	0.0%
1/8/13	0.6%
2/7/13	0.0%
3/8/13	0.0%
4/8/13	0.0%
5/8/13	0.0%
6/13/13	0.0%
8/15/13	0.0%

1/8/13	0.4%
2/7/13	0.1%
3/8/13	0.0%
4/8/13	0.0%
5/8/13	0.0%
6/13/13	0.0%
8/15/13	0.0%

11/27/12	0.0%
1/8/13	0.4%
2/7/13	0.0%
3/8/13	0.0%
4/8/13	0.0%
5/8/13	0.0%
6/13/13	0.0%
8/14/13	0.1%

11/27/12	0.1%
1/8/13	1.0%
2/7/13	0.2%
3/8/13	0.0%
4/8/13	0.0%
5/8/13	0.0%
6/13/13	0.0%
7/8/13	0.0%
8/14/13	0.1%

LEGEND

(SV) SOIL VAPOR SAMPLE LOCATION

NOTES:

- METHANE FIELD READINGS WERE MEASURED USING A GEM 2000 MULTI GAS METER.
- FIGURE FROM WITHERS & RAVENEL, DATED 6/21/13.
- NM = NOT MEASURED

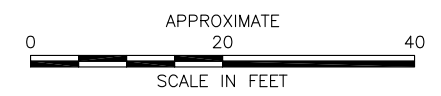
TITLE
METHANE FIELD MEASUREMENTS
AUGUST 2013

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

hart hickman
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: 08/28/13
REVISION NO. 0

JOB NO. DS0-84
FIGURE NO. 1



\\hsvr\hart\hickman\local\masterfiles\AAA-Master Projects\DSCA - DS0\DS0-84 One Hr Martinizing (former BB&T)\Figures\DC20013_20130828_Figures.txdwg, 8/30/2013 12:52:14 PM, Adobe PDF



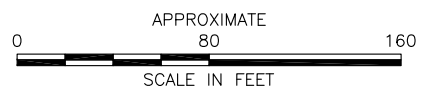
LEGEND

- SITE PROPERTY BOUNDARY
- - - - - PROPERTY PARCEL
- ⊕ TYPE II MONITORING WELL
- ABANDONED MONITORING WELL

W. CLUB BOULEVARD

FORMER ONE HOUR MARTINIZING FACILITY

NOTES:
 1. DATA SOURCES: DURHAM COUNTY GIS, WITHERS & RAVENEL.
 2. LOCATIONS OF MONITORING WELLS MW-21, MW-23S, AND MW-23I ARE APPROXIMATE.



TITLE		SITE MAP	
PROJECT		ONE HOUR MARTINIZING DSCA ID NO: 32-0013 1103 WEST CLUB BLVD DURHAM, NORTH CAROLINA	
		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: 08/30/13	REVISION NO. 0		
JOB NO. DS0-84	FIGURE NO. 2		