2660

February 19, 2014

Dallas Investment Corp.
c/o Mr. Keith Hopson
Husch Blackwell, LLP
111 Congress Avenue, Suite 1400
Austin, Texas 78701

RE: Limited Phase II Environmental Investigation
5015 Spectrum Drive
Addison, Texas
W&M Project No. 1379.001

Dear Mr. Hopson:

W&M Environmental Group, Inc. (W&M) performed a Limited Phase II Investigation on behalf of Dallas Investment Corp. (DIC) c/o Husch Blackwell, LLP , consisting of soil and groundwater assessment at the property located at 5015 Spectrum Drive, Addison, Dallas County, Texas (Site). The Site is approximately 5 acres in size and is a vacant fenced property with grass and gravel areas and a small concrete pad located on the southwest section of the property.

Site investigation activities were conducted to assess potential impacts from the off-site sources associated with the former Ashland Chemical Company (Ashland) facility that was located west of the Site. The results of the W&M investigation are presented in this letter report. The Site location is presented on **Figure 1** and sampling locations are presented on **Figure 2**. Photographs collected during the Limited Phase II investigation are presented in **Attachment A.**

BACKGROUND INFORMATION

Ashland operated a facility in Addison, Texas on the southwest corner of Arapaho Road and Quorum Drive, which is now Edwin Lewis Drive and Quorum Drive. A limited Phase II Investigation report completed by Halff Associates, Inc. (Halff) in 1994 discussed a previous Phase I ESA completed by Halff in which permits from the City of Addison Fire Department identified the storage, handling and use of flammable liquids at the Ashland facility. The Halff report also stated the Ashland facility sought a permit for "desired storage" for an on-site tank farm with tank capacity of 500,000 gallons, drum storage with capacities of 55,000 gallons, and approximately 10,000 square feet of warehouse storage space for flammable, corrosive, and various non-hazardous materials.

As a part of the Phase II site investigation Halff collected groundwater and soil samples on the Ashland property; no sampling was performed on the DIC Site. The Halff Phase II identified detectable concentrations of volatile organic compound (VOCs) and total petroleum hydrocarbons (TPH) in the soil and groundwater.

A remedial action report completed by Woodward-Clyde and dated May 1998 stated that remedial action was conducted on the Ashland property in late 1997 and 1998. The remedial action consisted of the removal and disposal of impacted soil from an area 40 feet x 40 feet to a maximum depth of 12 feet with 1,300 cubic yards of soil removed.

The Ashland property and two additional tracts (Tract 2 and Tract 3) were entered into the Voluntary Cleanup Program (VCP) administered by the Texas Natural Resource Conservation Commission (TNRCC, predecessor to the current Texas Commission on Environmental Quality [TCEQ]). The additional tracts were presumably included in the VCP closure because affected groundwater had migrated to those properties from the Ashland facility. Ownership of Tract 2 was identified as DIC and corresponds to the Site. Tract 3 was identified as property owned by the Town of Addison. Review of the VCP files indicates that the closures were based upon a prohibition on "*the exposure to and use of groundwater from the site for residential, agricultural, recreational, industrial or commercial purposes without the express written pre-approval of the TNRCC or the State of Texas*".

In March of 1994, Trinity Engineering Testing Corporation (Trinity) conducted a Phase II site investigation on the Site. The Phase II consisted of the installation of two soil borings to depths ranging from 22 to 25 feet and four composite samples recovered from a depth of 0 to 1 foot. The Trinity site investigation detected the presence of Resource Conservation & Recovery Act (RCRA) 8 metals and TPH in the soil samples collected at the Site. Two boreholes were advanced for the collection of groundwater samples. One borehole located near the southwest section of the property was dry and no groundwater sample was collected; a groundwater sample was collected from the other borehole. TPH and RCRA 8 metals were detected in the groundwater sample.

Based on the Ashland data and the Trinity Phase II investigation, W&M selected locations throughout the property to collect soil and groundwater samples to determine if the Site has been impacted from off-site activities.

SUBSURFACE INVESTIGATION

From January 31 through February 14, 2014, W&M conducted a limited investigation consisting of the advancement of 10 shallow soil borings, installation of three permanent groundwater monitoring wells, and yield testing to investigate the presence of chemicals of concern (COCs) in the soil and groundwater at the Site and to determine the classification of the aquifer beneath the Site.

Soil Investigation

On January 31, 2014, 10 shallow soil borings (SB-01 through SB-10) were advanced in selected locations across the property. Soil boring and sample locations are shown on **Figure 2**. The soil borings were advanced to 4 feet below ground surface (bgs) using a truck-mounted direct-push drill rig. Soil sample locations were evenly distributed across the Site and analytical parameters were determined based on the nature of activities associated with the Ashland facility. One grab sample was collected from each boring for laboratory analysis. Two soil samples were analyzed for VOCs, four soil samples were analyzed for TPH, and all 10 soil samples were analyzed for RCRA 8 metals.

Soil samples selected for chemical analysis were from the depths of highest photoionization detector (PID) readings, visually impacted soil, or the bottom interval depth of 3 to 4 feet. PID readings did not exceed 0.5 parts per million (ppm) in the soil borings. Soil samples were collected from the 3 to 4 foot since no other field indicators of contamination were noted.

A total of 10 soil samples were collected, placed in laboratory-supplied glass jars, stored on ice, and delivered to ESC Lab Sciences (ESC) in Mt. Juliet, Tennessee. Soil samples collected were analyzed for eight RCRA metals by U.S. Environmental Protection Agency (EPA) Methods 6010B and 7471, TPH by Texas Method TX1005, and VOCs by EPA Method 8260B.

Site geology in the shallow borings consists of gray and dark gray silty clay followed by weathered limestone which was encountered at depths ranging from 3 to 16 feet. Soil boring logs are provided in **Attachment B**.

Investigative derived waste (IDW) was collected in one 55-gallon steel drum, properly labeled, and stored at the Site pending analytical results.

Groundwater Investigation

On February 7, 2014, W&M returned to the Site and installed three permanent groundwater monitoring wells (MW-01 thru MW-03). Permanent groundwater monitoring wells were installed to depths ranging from 19.5 to 22.5 feet to allow for the collection of groundwater samples for RCRA 8 metals. Groundwater was not observed in the three wells following installation. The wells were allowed to recharge over a 48-hour period and W&M returned on February 10, 2014 to collect groundwater samples. Two of the three monitoring wells, MW-02, and MW-03, remained dry and were not sampled. Groundwater was observed in MW-01 and a groundwater sample was collected. Prior to collecting the groundwater sample, W&M gauged monitoring well MW-01 with the depth to water measured at 12.20 bgs. Because only one well contained groundwater, a groundwater gradient and groundwater flow direction could not be established. Based on data (network of monitoring wells) presented in the Ashland file, the groundwater flow direction is in a northeast direction.

W&M collected groundwater samples from MW-01 using a peristaltic pump with disposable tubing. Groundwater samples were collected in pre-preserved, laboratory-supplied containers, stored on ice, and delivered via overnight courier to ESC Lab Sciences in Mt. Juliet, Tennessee with analysis for VOCs, TPH, and the RCRA metals arsenic, lead, and selenium. Only three metals were analyzed based on the soil sample results, which indicated that the other RCRA 8 metals were not present in soils at concentrations above TCEQ Texas Risk Reduction Program (TRRP) Tier 1 residential protective concentration levels (PCLs). Groundwater samples collected were analyzed for RCRA metals by U.S. Environmental Protection Agency (EPA) Methods 6010B/6020, TPH by Texas Method TX 1005, and VOCs by EPA Method 8260B.

GROUNDWATER YIELD TEST

On February 14, 2014, a cyclic discharge test was performed on monitoring well MW-01 to determine the well yield. The yield test was conducted in accordance to TCEQ Regulatory Guidance document RG-366/TRRP-8 *Groundwater Classification* (Method 2a). The well was bailed dry and timed water level measurements were collected from completion of water removal until the water level reached approximately 90% of the height of the initial static water level. The recharged groundwater was evacuated from the monitoring well and the volume of the water removed was recorded. Beginning with timed water level measurements, the process was repeated twice more until three complete "bail-down and recovery" events were conducted. Approximately 7.99 gallons of water were pumped out of the well during the three bail down events. It took approximately 98 minutes to complete the three recovery events. Monitoring well MW-01 exhibited a sustainable yield of approximately 127.8 gallons per day (gpd), which is less than the TRRP-8 maximum well yield of 150 gpd and indicative of a Class 3 groundwater-bearing unit (GWBU).

SAMPLE ANALYSIS AND RESULTS

Soil Summary

Soil analytical results are summarized in **Tables 1**. The soil analytical results were initially compared to the TRRP Tier 1 PCLs for the total soil combined ($^{Tot}Soil_{Comb}$) pathway, the soil to groundwater ($^{GW}Soil_{Ing}$) pathway protective of groundwater ingestion, and the Texas-specific soil background concentration (TSBC) for RCRA 8 metals if established. Both PCLs assume residential land use (applies to industrial sites when determining TRRP applicability) and 0.5-acre source area. The laboratory analytical data package is provided in **Attachment C**.

Soil analytical results for metals were initially compared to $^{GW}Soil_{Ing}$ and the TSBC. RCRA 8 metals were detected in all 10 soil samples, with the metals arsenic, lead, and selenium at concentrations above the default PCLs. Following the completion of the well yield test identifying groundwater at the Site as a Class 3 aquifer, soil analytical results were compared to Tier 1 critical PCLs (cPCLs) for soil protective of Class 3 groundwater ($^{GW}Soil_{Class3}$). None of the RCRA 8 metals were detected at concentrations above their respective $^{GW}Soil_{Class3}$ cPCLs.

TPH was not reported above laboratory detection limits in any of the four soil samples collected from the Site. VOCs were not detected in the two soil samples above analytical detection limits.

Synthetic Precipitation Leaching Procedures

The Synthetic Precipitation Leaching Procedure (SPLP) analysis (leach test) was completed on a rush analysis schedule and was conducted prior to the installation of MW-01 and the well yield testing. SPLP was conducted on the three soil samples displaying the highest RCRA 8 metal concentrations. Soil samples SB-05, SB-09, and SB-10 were analyzed for SPLP. Soil sample SB-05 was analyzed for arsenic and lead; SB-09 and SB-10 were analyzed for arsenic and selenium. All SPLP results were below their respective ground to groundwater ($^{GW}GW_{Ing}$) pathway protective of groundwater ingestion. SPLP analytical results are summarized in **Tables 2**

Groundwater Summary Results

A groundwater sample was collected from MW-01 only, as the two other monitoring wells were dry upon well gauging. Groundwater analytical results are summarized in **Table 3**. The groundwater analytical results were compared to the TRRP cPCLs for a Class 3 aquifer ($^{GW}GW_{Class3}$) protective of groundwater ingestion and assuming residential land use. The laboratory analytical data package is provided in **Attachment C**.

Arsenic, lead, and selenium were detected in MW-01 but at concentrations lower than the $^{GW}GW_{Class3}$ cPCLs

TPH was detected in the C6 – C12 range but at a concentration lower than the $^{GW}GW_{Class3}$ cPCLs.

Twenty VOCs were detected in MW-01, but none were detected above the $^{GW}GW_{Class3}$ cPCLs.

Quality Control/Quality Assurance

W&M reviewed the laboratory review checklists (LRCs) and quality control/quality assurance data provided with the laboratory reports by ESC. The following exception reports were generated for samples collected:

Groundwater Laboratory Data Package

- The duplicate relative percent difference (RPD) exceeded the laboratory control limits for lead and selenium

Soil Laboratory Data Package

- The matrix spike or matrix spike duplicate recoveries were below the laboratory control limits for barium.
- The RPDs exceeded laboratory limits for barium.
- The duplicate RPD exceeds laboratory limits for arsenic, cadmium, lead and selenium. The serial distribution RPD exceeded laboratory limits for arsenic, barium, cadmium, chromium, and lead.

The exception reports are associated with the laboratory control samples. Additionally, no data was rejected by the laboratory as a result of these exception reports.

CONCLUSIONS

Ten shallow soil borings were advanced into the subsurface soils to a depth up to 4 feet bgs. Three permanent monitoring wells were installed at the Site at depths ranging from 19.5 to 22.5 feet. One monitoring well recharged producing groundwater, and the other two monitoring wells remained dry. Weathered limestone was encountered at the Site at depths ranging from 3 to 16 feet bgs. Well yield testing conducting at the Site, determined that the groundwater aquifer beneath the Site is a Class 3 GWBU.

TPH and VOCs were not detected in the 10 soil samples collected from the Site. RCRA 8 metals were detected in all 10 samples but all were below their respective $^{GW}Soil_{Class3}$ cPCLs. SPLP analysis was conducted on three soil samples and all were below their respective $^{GW}GW_{Ing}$ PCLs and the $^{GW}GW_{class3}$ cPCLs indicating that the metals were not leaching from the soil.

Groundwater analysis was completed for three RCRA metals, arsenic, lead, and selenium from monitoring well MW-01. The three RCRA 8 metals were detected in the groundwater but at concentrations below their respective $^{GW}GW_{Class3}$ cPCLs (groundwater not impacted). TPH was detected in the $C_6 - C_{12}$ range but at a concentration lower than the $^{GW}GW_{Class3}$ cPCLs. Twenty VOCs were detected in MW-01, but none were detected above the $^{GW}GW_{Class3}$ cPCLs.

RECOMMENDATIONS

Based on the results of the groundwater and soil investigation conducted at the Site, it W&M's professional opinion that the Site is not an affected property. However, because the property received a final certificate of completion (COC) under VCP No. 204 (Tract #2) with a deed restriction for non-residential land use, a new VCP application needs to be submitted to the TCEQ for the Site to receive a final COC allowing residential land use. The COC also contains a deed restriction prohibiting the exposure to and use of groundwater from the Site for residential, agricultural, recreational and industrial/

or commercial purposes. Assuming Client agrees with this condition, we recommend that this groundwater use restriction remain in place.

In submitting a new VCP application, two scenarios are available to address groundwater at the Site.

Scenario 1: Evaluate the Site under the current groundwater deed restriction remaining in place. This would eliminate the need to incorporate or evaluate the Site using TRRP groundwater pathway PCLs $^{GW}GW_{Ing}$ or $^{GW}GW_{Class3}$. The Site would be evaluated under the TRRP $^{Air}GW_{Inh\text{-}V}$, $^{Air}Soil_{Inh\text{-}V}$ and $^{Tot}Soil_{Comb}$ residential PCLs which are higher than the groundwater pathway PCLs.

Scenario 2: Evaluate the Site using the Class 3 groundwater aquifer designation determined for the Site during W&M's site investigation. This option will allow the use of Class 3 groundwater designation PCLs which are higher than the groundwater ingestion PCLs ($^{GW}GW_{Ing}$ or $^{GW}Soil_{Ing}$).

With both scenarios a new VCP application, $1,000 fee and affected property assessment report (APAR) would be submitted to the TCEQ. In addition to these tasks, it is likely that the TCEQ will require a drinking water survey report (DWSR) for Scenario 2 and probably not for Scenario 1. The necessity for the DWSR would be determined by the TCEQ case coordinator.

QUALIFICATIONS

This report was prepared for the sole use of DIC and shall not be relied upon by any other party without the express prior written consent of DIC and W&M. This document was developed by employing generally accepted methods and customary practices of the environmental profession.

W&M appreciates the opportunity to be of service to you on this project. If you have any questions or need additional information, please feel free to contact Mr. Patrick Johnson at 972-509-9610.

Sincerely,

W&M ENVIRONMENTAL GROUP, INC.

Patrick D. Johnson

Patrick Johnson, P.E.
Project Manager

Michael Whitehead

Michael Whitehead.
Senior Consultant

FIGURES

TABLE 5B-1B
GROUNDWATER ANALYTICAL DATA SUMMARY - ON-SITE MONITORING WELLS BY OTHERS

5015 Spectrum Drive (SEC Quorum Dr. & Edwin Lewis Dr.)
Addison, Texas

SAMPLE ID[1]	$^{GW}GW_{Ing}$[2]	$^{GW}GW_{Class\ 3}$[3]	On-Site Samples Collected by Others[4]						
			MW-37	MW-37	MW-37	MW-38	MW-38	MW-39	B-2
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
DATE SAMPLED			4/10/1997	3/3/1998	4/9/1998	3/4/1998	4/9/1998	4/9/1998	3/23/1994
RCRA Metals[5]									
Arsenic	0.01	**1**	---	---	---	---	---	---	0.27
Barium	2	**200**	---	---	---	---	---	---	0.82
Cadmium	0.005	**0.5**	---	---	---	---	---	---	0.024
Chromium	0.1	**10**	---	---	---	---	---	---	0.14
Lead	0.015	**1.5**	---	---	---	---	---	---	0.081
Mercury	0.002	**0.2**	---	---	---	---	---	---	<0.00011
Selenium	0.05	**5**	---	---	---	---	---	---	<0.078
Silver	0.12	**12**	---	---	---	---	---	---	0.062
Total Petroleum Hydrocarbons (TPH)[6]									
TPH C6 - C12	0.98	**98**	---	---	---	---	---	---	---
TPH C12 - 28	0.98	**98**	---	---	---	---	---	---	---
TPH C28 - 35	0.98	**98**	---	---	---	---	---	---	---
Total TPH'	---	---	---	---	---	---	---	---	35
Volatile Organic Compounds (VOCs)[7]									
Benzene	0.005	**0.5**	<0.100	<0.05	0.072	0.015	0.023	---	---
sec-Butylbenzene	0.98	**98**	---	---	---	---	---	---	---
tert-Butylbenzene	0.98	**98**	---	---	---	---	---	---	---
Chlorobenzene	0.1	**10**	5.00	2.20	3.70	<0.05	0.019	---	---
Chloroethane	9.8	**980**	---	---	---	---	---	---	---
2-Chlorotoluene	0.49	**49**	---	---	---	---	---	---	---
1,2-Dichlorobenzene	0.6	**60**	---	---	---	---	---	---	---
1,3-Dichlorobenzene	0.73	**73**	---	---	---	---	---	---	---
1,4-Dichlorobenzene	0.075	**7.5**	0.230	<0.050	0.095	---	---	---	---
1,1-Dichloroethane	4.9	**490**	---	---	---	---	---	---	---
1,1-Dichloroethene	0.007	**0.7**	---	---	---	---	---	---	---
cis-1,2-Dichloroethene	0.070	**7**	---	---	---	<0.05	0.350	0.0033	---
trans-1,2-Dichloroethene	0.100	**10**	---	---	---	<0.05	0.012	---	---
Ethylbenzene	0.7	**70**	1.20	0.18	0.420	---	---	---	---
Isopropylbenzene	2.4	**240**	---	---	---	---	---	---	---
Methyl tert-butyl ether	0.24	**24**	---	---	---	---	---	---	---
Toluene	1	**100**	---	---	---	---	---	---	---
Trichloroethene	0.005	**0.5**	---	---	---	---	---	---	---
Vinyl chloride	0.002	**0.2**	---	---	---	**0.26**	0.200	---	---
Xylenes, Total	10	**1,000**	4.100	0.54	1.400	---	---	---	---

Notes:

[1]Samples collected by W&M Environmental Group, Inc. and analyzed by ESC Lab Sciences in Mt. Juliet, Tennessee.

[2]Texas Risk Reduction Program (TRRP) $^{GW}GW_{Ing}$ for Residential.

[3]Texas Risk Reduction Program (TRRP) $^{GW}GW_{Class\ 3}$ for Residential.

[4]Groundwater sample collected from B-1 by Trinity Engineering Testing Corporation and analyzed by EET, Inc. in Austin, Texas; and groundwater samples collected from monitoring wells MW-37, MW-38, and MW-39 were collected by Woodward-Clyde.

[5]Resource Conservation and Recovery Act (RCRA) Metals analyzed by EPA Method 6010/7471B.

[6]Total TPH analyzed by U.S. Enivronmental Protection Agency (EPA) EPA Method 418.1

[7]Volatile organic compounds (VOCs) analyzed by U.S. Environmental Protection Agency (EPA) EPA Method 8260.

J - Estimated value below the lowest calibration point. Confidence correlates with concentration.

P1 - RPD value not applicable for sample concentrations less than 5 times the reporting limit.

Bold indicates the action level and concentrations in exceedance of applicable PCL.

Any VOC analyte not listed was below the sample detection limit.

TABLE 4D
SOIL ANALYTICAL DATA SUMMARY

5015 Spectrum Drive (SEC Quorum Dr. & Edwin Lewis Dr.)
Addison, Texas

SAMPLE ID[1]	$^{Tot}Soil_{Comb}$[2]	$^{GW}Soil_{Ing}$[3]	$^{GW}Soil_{Class\ 3}$[4]	Texas Specific Background Value	On-Site Samples Collected By Others[5,6]							Samples Collected By W&M									
					B-1	B-1	B-2	Area 1	Area 2	Area 3	Area 4	SB-01- 4 ft	SB-02- 4 ft	SB-03- 4 ft	SB-04- 4 ft	SB-05- 4 ft	SB-06- 4 ft	SB-07- 4 ft	SB-08- 4 ft	SB-09- 4 ft	SB-10- 4 ft
DEPTH (ft)					2-3.5 ft	6-8 ft	10-11.5 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft
DATE SAMPLED					3/23/94	3/23/94	3/23/94	3/23/94	3/23/94	3/23/94	3/23/94	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14
Volatile Organic Compounds (VOCs)7 (mg/kg)																					
All Other VOCs	Varies	Varies	Varies	---	---	---	---	---	---	---	---	---	<SDL	---	<SDL	---	---	---	---	---	---
Total Petroleum Hydrocarbons (TPH)[8] (mg/kg)																					
TPH C_6 - C_{12}	1,600	65	6,500	---	---	---	---	---	---	---	---	---	< 15	---	< 15	< 15	---	---	< 15	---	---
TPH C_{12} - C_{28}	2,300	200	20,000	---	---	---	---	---	---	---	---	---	<15	---	<15	<15	---	---	<15	---	---
TPH C_{28} - C_{35}	2,300	200	20,000	---	---	---	---	---	---	---	---	---	<15	---	<15	<15	---	---	<15	---	---
Total TPH[9]	---	---	---	---	21	<5.0	47	54	<5.0	27	<5.0	---	---	---	---	---	---	---	---	---	---
RCRA Metals[10] (mg/kg)																					
Arsenic	24	5	**500**	5.9	10	7.4	<1.4	<1.4	<1.4	5.3	1.7	6	6.9	8.1	7.2	7	8.1	6.1	6.6	9.2	6.4
Barium	8,100	440	**44,000**	300	100	27	24	25	22	20	24	150	49	200	160	220	160	100	200	58	24
Cadmium	52	1.5	**150**	---	2.2	0.86	0.36	0.30	0.44	0.23	0.37	0.34 J	0.27 J	0.30 J	0.43	0.81	0.45	0.35	0.73	0.37	0.19 J
Chromium	33,000	2,400	**240,000**	30	16	7	7.2	5.7	7.7	6.9	23	32	17	38	38	42	34	35	40	21	9.4
Lead	500	3	**300**	15	10	1.9	2.8	2.6	3.6	1.1	3.9	15	9.1	17	16	22	15	16	18	9.8	5.2
Mercury	3.6	0.0078	**0.78**	0.04	<0.0061	<0.0061	<0.0061	0.0092	<0.0061	0.013	<0.0061	0.0083 J	0.024	0.0073 J	0.012 J	0.011 J	0.0091 J	0.011 J	0.012 J	0.016 J	0.018 J
Selenium	310	2.3	**230**	0.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	2.6	2.9	2.1	2.8	0.52 J	2.5	2.4	1.6	2.7	3.4
Silver	97	0.48	**48**	---	17	1.6	<0.17	<0.17	<0.17	<0.17	<0.17	<0.14	<0.14	<0.14	<0.14	0.14 O	<0.14	<0.14	<0.14	<0.14	<0.14

Notes:

[1]Samples collected by W&M Environmental Group, Inc. and analyzed by ESC Lab Sciences in Mt. Juliet, Tennessee.

[2]Texas Risk Reduction Program (TRRP) $^{Tot}Soil_{Comb}$ residential protective concentration level (PCL), 0.5 acre source area.

[3]TRRP $^{GW}Soil_{Ing}$ residential protective concentration levels PCLs, 0.5 acre source area.

[4]TRRP $^{GW}Soil_{Class\ 3}$ residential protective concentration levels PCLs, 0.5 acre source area.

[5]Samples B-1, B-2, and Areas 1, 2, 3, and 4 collected by Trinity Engineering Testing Corporation and analyzed by EET, Inc. in Austin, Texas.

[6]Composite sample taken from multiple shallow borings for Areas 1, 2, 3, and 4.

[7]Volatile organic compounds (VOCs) analyzed by U.S. Environmental Protection Agency (EPA) Method 8260.

[8]Total petroleum hydrocarbons (TPH) analyzed by Texas Commission on Environmental Quality (TCEQ) Texas Method 1005.

[9]Total TPH analyzed by U.S. Environmental Protection Agency (EPA) EPA Method 418.1

[10]Resource Conservation and Recovery Act (RCRA) 8 Metals analyzed by EPA Method 6010/7471B.

J - Estimated value below the lowest calibration point. Confidence correlates with concentration.

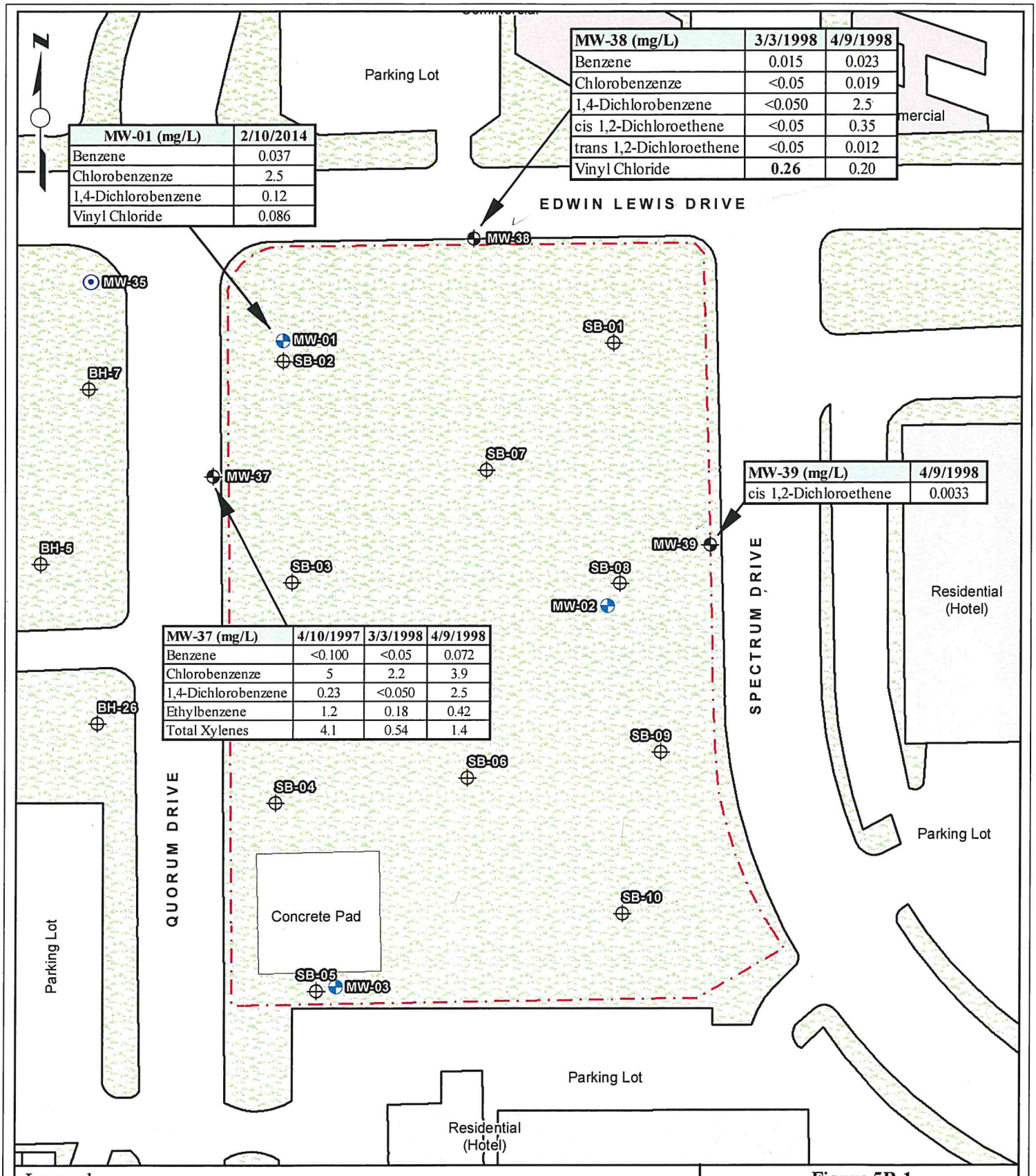
O - Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

SDL = Sample Detection Limit

Bold indicates concentrations in exceedance of applicable PCL

Any VOC analyte not listed was below the sample detection limit.

--- = No value available



MW-01 (mg/L)	2/10/2014
Benzene	0.037
Chlorobenzenze	2.5
1,4-Dichlorobenzene	0.12
Vinyl Chloride	0.086

MW-38 (mg/L)	3/3/1998	4/9/1998
Benzene	0.015	0.023
Chlorobenzenze	<0.05	0.019
1,4-Dichlorobenzene	<0.050	2.5
cis 1,2-Dichloroethene	<0.05	0.35
trans 1,2-Dichloroethene	<0.05	0.012
Vinyl Chloride	**0.26**	0.20

MW-39 (mg/L)	4/9/1998
cis 1,2-Dichloroethene	0.0033

MW-37 (mg/L)	4/10/1997	3/3/1998	4/9/1998
Benzene	<0.100	<0.05	0.072
Chlorobenzenze	5	2.2	3.9
1,4-Dichlorobenzene	0.23	<0.050	2.5
Ethylbenzene	1.2	0.18	0.42
Total Xylenes	4.1	0.54	1.4

Legend

- Approximate Site Boundary
- Grassed Area
- Sample Location
- Monitoring Well - W&M
- Monitoring Well - Woodward-Clyde
- Monitoring Well - Off-Site

Source: Dallas Central Appraisal District, ESRI (12/2010)
Note: Sample locations are approximate

0 50 100 200 Feet

SCALE: 1"=100'

Figure 5B-1
Groundwater COC Concentration Map - VOCs
5015 Spectrum Drive
Addison, Texas

W&M Environmental Group, Inc.

9/5/2014	W&M Project No.: 1379.001.002	Check By: PJ	Drawn: JPM	Revised:

TABLE 5B-1
GROUNDWATER ANALYTICAL DATA SUMMARY - ON-SITE MONITORING WELLS

5015 Spectrum Drive (SEC Quorum Dr. & Edwin Lewis Dr.)
Addison, Texas

SAMPLE ID[1]	$^{GW}GW_{Ing}$[2]	$^{GW}GW_{Class\ 3}$[3]	On-Site Samples Collected by Others[4]							Sample Collected by W&M
			MW-37	MW-37	MW-37	MW-38	MW-38	MW-39	B-2	MW-01
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
DATE SAMPLED			4/10/1997	3/3/1998	4/9/1998	3/4/1998	4/9/1998	4/9/1998	3/23/2014	2/10/2014
RCRA Metals[5]										
Arsenic	0.01	**1**	---	---	---	---	---	---	0.27	0.0050
Barium	2	**200**	---	---	---	---	---	---	0.82	---
Cadmium	0.005	**0.5**	---	---	---	---	---	---	0.024	---
Chromium	0.1	**10**	---	---	---	---	---	---	0.14	---
Lead	0.015	**1.5**	---	---	---	---	---	---	0.081	0.00055 J, P1
Mercury	0.002	**0.2**	---	---	---	---	---	---	<0.00011	---
Selenium	0.05	**5**	---	---	---	---	---	---	<0.078	0.00099 J, P1
Silver	0.12	**12**	---	---	---	---	---	---	0.062	---
Total Petroleum Hydrocarbons (TPH)[6]										
TPH C6 - C12	0.98	**98**	---	---	---	---	---	---	---	1.6
TPH C12 - 28	0.98	**98**	---	---	---	---	---	---	---	<0.60
TPH C28 - 35	0.98	**98**	---	---	---	---	---	---	---	<0.60
Total TPH[7]	---	---	---	---	---	---	---	---	35	---
Volatile Organic Compounds (VOCs)[8]										
Benzene	0.005	**0.5**	<0.100	<0.05	0.072	0.015	0.023	---	---	0.037
sec-Butylbenzene	0.98	**98**	---	---	---	---	---	---	---	0.0022
tert-Butylbenzene	0.98	**98**	---	---	---	---	---	---	---	0.0031
Chlorobenzene	0.1	**10**	5.00	2.20	3.70	<0.05	0.019	---	---	2.5
Chloroethane	9.8	**980**	---	---	---	---	---	---	---	0.0043 J
2-Chlorotoluene	0.49	**49**	---	---	---	---	---	---	---	0.032
1,2-Dichlorobenzene	0.6	**60**	---	---	---	---	---	---	---	0.11
1,3-Dichlorobenzene	0.73	**73**	---	---	---	---	---	---	---	0.023
1,4-Dichlorobenzene	0.075	**7.5**	0.230	<0.050	0.095	---	---	---	---	0.12
1,1-Dichloroethane	4.9	**490**	---	---	---	---	---	---	---	0.032
1,1-Dichloroethene	0.007	**0.7**	---	---	---	---	---	---	---	0.00043 J
cis-1,2-Dichloroethene	0.070	**7**	---	---	---	<0.05	0.350	0.0033	---	0.052
trans-1,2-Dichloroethene	0.100	**10**	---	---	---	<0.05	0.012	---	---	0.0017
Ethylbenzene	0.7	**70**	1.20	0.18	0.420	---	---	---	---	0.00078 J
Isopropylbenzene	2.4	**240**	---	---	---	---	---	---	---	0.00064 J
Methyl tert-butyl ether	0.24	**24**	---	---	---	---	---	---	---	0.0014
Toluene	1	**100**	---	---	---	---	---	---	---	0.0015 J
Trichloroethene	0.005	**0.5**	---	---	---	---	---	---	---	0.0011
Vinyl chloride	0.002	**0.2**	---	---	---	**0.26**	0.200	---	---	0.086
Xylenes, Total	10	**1,000**	4.100	0.54	1.400	---	---	---	---	0.0015 J

Notes:

[1]Samples collected by W&M Environmental Group, Inc. and analyzed by ESC Lab Sciences in Mt. Juliet, Tennessee.

[2]Texas Risk Reduction Program (TRRP) $^{GW}GW_{Ing}$ for Residential.

[3]Texas Risk Reduction Program (TRRP) $^{GW}GW_{Class\ 3}$ for Residential.

[4]Groundwater sample collected from B-1 by Trinity Engineering Testing Corporation and analyzed by EET, Inc. in Austin, Texas; and groundwater samples collected from monitoring wells MW-37, MW-38, and MW-39 were collected by Woodward-Clyde.

[5]Resource Conservation and Recovery Act (RCRA) Metals analyzed by EPA Method 6010/7471B.

[6]Total petroleum hydrocarbons (TPH) analyzed by Texas Commission on Environmental Quality (TCEQ) Texas Method 1005.

[7]Total TPH analyzed by U.S. Enivronmental Protection Agency (EPA) EPA Method 418.1

[8]Volatile organic compounds (VOCs) analyzed by U.S. Environmental Protection Agency (EPA) EPA Method 8260.

J - Estimated value below the lowest calibration point. Confidence correlates with concentration.

P1 - RPD value not applicable for sample concentrations less than 5 times the reporting limit.

Bold indicates the action level and concentrations in exceedance of applicable PCL.

Any VOC analyte not listed was below the sample detection limit.

TABLE 5B-2
GROUNDWATER ANALYTICAL DATA SUMMARY - OFF-SITE SAMPLING

SWC Quorum Dr. & Edwin Lewis Drive
Addison, Texas

Sample ID[1]	Date Collected		Off-Site Samples Collected by Others[2]														
		TPH (mg/L)[3]	Benzene	Bromobenzene	Bromodichloro methane	Chlorobenzene	Cis-1,2-Dichloroethene	Ethylbenzene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	Trans-1,2-Dichloroethene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride
MW-35	3/4/1998	---	---	---	---	---	<0.010	---	---	---	---	<0.010	---	---	<0.010	---
	4/9/1998	---	---	---	---	---	0.640	---	---	---	---	0.016	---	---	0.086	---
MW-36	3/4/1998	---	---	---	---	---	<0.025	---	---	---	---	---	---	---	---	---
	4/9/1998	---	---	---	---	---	0.990	---	---	---	---	---	---	---	---	---
BH-5	7/25/1994	---	---	---	---	0.006	---	---	---	---	---	---	---	0.005	0.017	<0.010
	8/11/1994	---	---	---	---	<0.015	0.0	—	0.0	0.0	—	<0.005	---	<0.010	0.019	<0.025
	9/10/1996	---	---	---	---	0.005	0.0	—	<0.001	<0.001	—	<0.001	---	0.0031	0.013	0.002
	4/10/1997	---	---	---	---	0.0027	0.028	—	0.025	0.0055	—	---	---	<0.001	---	0.002
	3/3/1998	---	---	---	---	<0.001	0.029	---	0.045	0.0071	---	0.0022	---	<0.001	0.024	<0.001
BH-7	8/9/1994	1.4	<0.200	---	---	3.100	0.10	0.300	0.200	0.40	---	---	---	0.400	---	<0.500
	9/10/1996	---	0.03	<0.250	---	6.40	0.17	0.180	<0.026	0.69	---	---	---	0.0031	---	0.140
	4/10/1997	---	0.12	---	---	4.100	<0.100	0.450	<0.100	0.52	---	---	---	0.260	---	<0.100
	3/3/1998	---	<0.050	---	---	2.6	<0.050	0.100	<0.050	0.36	---	---	---	0.052	---	<0.050
BH-9	8/9/1994	---	<1.000	---	<0.500	2.50	7.80	<1.000	9.10	2.200	---	---	---	<1.000	---	<2.500
	9/10/1996	---	0.330	---	0.06	6.70	13.00	0.098	9.50	<0.021	---	---	---	0.110	---	1.800
	4/10/1997	---	<0.500	---	<0.500	4.00	14.00	<0.500	6.20	1.400	---	---	---	<0.500	---	1.800
	3/3/1998	---	<0.500	---	<0.500	<0.500	19.00	<0.500	6.00	0.620	---	---	---	0.780	---	<0.500
BH-17	8/9/1994	24	---	---	---	4.100	<0.300	<0.500	1.000	0.800	<0.300	---	---	<0.500	---	<1.300
	9/10/1996	---	---	---	---	3.600	0.170	0.260	0.840	0.740	0.120	---	---	0.130	---	<0.090
	4/10/1997	---	---	---	---	3.300	0.140	0.730	0.550	0.500	0.180	---	---	<0.050	---	0.130
	3/3/1998	---	---	---	---	0.670	<0.025	0.075	0.046	0.093	<0.025	---	---	<0.025	---	<0.025
BH-26	9/26/1994	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	9/10/1996	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	4/10/1997	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	3/3/1998	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
BH-27	9/26/1994	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	9/10/1996	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	4/10/1997	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	3/3/1998	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
BH-31	9/26/1994	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	9/10/1996	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	4/10/1997	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
	3/3/1998	---	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL	<SDL		<SDL
$^{GW}GW_{Class\ 3}$ Tier 1 Residential PCL[4]		---	**0.500**	**20.000**	**1.500**	**10.000**	**7.000**	**70.000**	**60.000**	**7.500**	**490.000**	**10.000**	**0.500**	**1**	**1**	**0.20**
$^{GW}GW_{Ing}$ Tier 1 Residential PCL[5]		---	0.005	0.200	0.015	0.100	0.070	0.700	0.600	0.075	4.900	0.100	0.005	1	0	0.0

Notes:

[1]Samples collected by Woodward-Clyde in 1997 and 1998

[2]Groundwater sample collected from B-1 was collected by Trinity Engineering Testing Corporation and analyzed by EET, Inc. in Austin, Texas; and groundwater samples collected from monitoring wells MW-37, MW-38, and MW-39 were collected by Woodward-Clyde.

[3]Total TPH analyzed by U.S. Enivronmental Protection Agency (EPA) EPA Method 418.1

[4]The Texas Risk Reduction Program (TRRP) $^{GW}GW_{Ing}$ for Residential protective concentation levels (PCLs) are presented for data comparison.

[5]The Texas Risk Reduction Program (TRRP) $^{GW}GW_{Class\ 3}$ for Residential PCL are presented for data compariosn.

[6]Volatile organic compounds (VOCs) analyzed by U.S. Environmental Protection Agency (EPA) EPA Method 8260.

J - Estimated value below the lowest calibration point. Confidence correlates with concentration.

<SDL - Less than sample detection limit.

Bold indicates the action level and concentrations in exceedance of applicable PCL.

Any VOC analyte not listed was below the sample detection limit.

TABLE 4D
SOIL ANALYTICAL DATA SUMMARY

5015 Spectrum Drive (SEC Quorum Dr. & Edwin Lewis Dr.)
Addison, Texas

SAMPLE ID[1]	$^{Tot}Soil_{Comb}$[2]	$^{GW}Soil_{Ing}$[3]	$^{GW}Soil_{Class\ 3}$[4]	Texas Specific Background Value	On-Site Samples Collected By Others[5,6]							Samples Collected By W&M									
DEPTH (ft)					B-1	B-1	B-2	Area 1	Area 2	Area 3	Area 4	SB-01- 4 ft	SB-02- 4 ft	SB-03- 4 ft	SB-04- 4 ft	SB-05- 4 ft	SB-06- 4 ft	SB-07- 4 ft	SB-08- 4 ft	SB-09- 4 ft	SB-10- 4 ft
DATE SAMPLED					2-3.5 ft	6-8 ft	10-11.5 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft
Volatile Organic Compounds (VOCs)7 (mg/kg)					3/23/94	3/23/94	3/23/94	3/23/94	3/23/94	3/23/94	3/23/94	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14	1/31/14
All Other VOCs	Varies	Varies	Varies	---	---	---	---	---	---	---	---	---	<SDL	---	<SDL	---	---	---	---	---	---
Total Petroleum Hydrocarbons (TPH)[8] (mg/kg)																					
TPH C_6 - C_{12}	1,600	65	6,500	---	---	---	---	---	---	---	---	---	< 15	---	< 15	< 15	---	---	< 15	---	---
TPH C_{12} - C_{28}	2,300	200	20,000	---	---	---	---	---	---	---	---	---	<15	---	<15	<15	---	---	<15	---	---
TPH C_{28} - C_{35}	2,300	200	20,000	---	---	---	---	---	---	---	---	---	<15	---	<15	<15	---	---	<15	---	---
Total TPH[9]	---	---	---	---	21	<5.0	47	54	<5.0	27	<5.0	---	---	---	---	---	---	---	---	---	---
RCRA Metals[10] (mg/kg)																					
Arsenic	24	5	**500**	5.9	10	7.4	<1.4	<1.4	<1.4	5.3	1.7	6	6.9	8.1	7.2	7	8.1	6.1	6.6	9.2	6.4
Barium	8,100	440	**44,000**	300	100	27	24	25	22	20	24	150	49	200	160	220	160	100	200	58	24
Cadmium	52	1.5	**150**	---	2.2	0.86	0.36	0.30	0.44	0.23	0.37	0.34 J	0.27 J	0.30 J	0.43	0.81	0.45	0.35	0.73	0.37	0.19 J
Chromium	33,000	2,400	**240,000**	30	16	7	7.2	5.7	7.7	6.9	23	32	17	38	38	42	34	35	40	21	9.4
Lead	500	3	**300**	15	10	1.9	2.8	2.6	3.6	1.1	3.9	15	9.1	17	16	22	15	16	18	9.8	5.2
Mercury	3.6	0.0078	**0.78**	0.04	<0.0061	<0.0061	<0.0061	0.0092	<0.0061	0.013	<0.0061	0.0083 J	0.024	0.0073 J	0.012 J	0.011 J	0.0091 J	0.011 J	0.012 J	0.016 J	0.018 J
Selenium	310	2.3	**230**	0.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	2.6	2.9	2.1	2.8	0.52 J	2.5	2.4	1.6	2.7	3.4
Silver	97	0.48	**48**	---	17	1.6	<0.17	<0.17	<0.17	<0.17	<0.17	<0.14	<0.14	<0.14	<0.14	0.14 O	<0.14	<0.14	<0.14	<0.14	<0.14

Notes:

[1]Samples collected by W&M Environmental Group, Inc. and analyzed by ESC Lab Sciences in Mt. Juliet, Tennessee.

[2]Texas Risk Reduction Program (TRRP) $^{Tot}Soil_{Comb}$ residential protective concentration level (PCL), 0.5 acre source area.

[3]TRRP $^{GW}Soil_{Ing}$ residential protective concentration levels PCLs, 0.5 acre source area.

[4]TRRP $^{GW}Soil_{Class\ 3}$ residential protective concentration levels PCLs, 0.5 acre source area.

[5]Samples B-1, B-2, and Areas 1, 2, 3, and 4 collected by Trinity Engineering Testing Corporation and analyzed by EET, Inc. in Austin, Texas.

[6]Composite sample taken from multiple shallow borings for Areas 1, 2, 3, and 4.

[7]Volatile organic compounds (VOCs) analyzed by U.S. Environmental Protection Agency (EPA) Method 8260.

[8]Total petroleum hydrocarbons (TPH) analyzed by Texas Commission on Environmental Quality (TCEQ) Texas Method 1005.

[9]Total TPH analyzed by U.S. Environmental Protection Agency (EPA) EPA Method 418.1

[10]Resource Conservation and Recovery Act (RCRA) 8 Metals analyzed by EPA Method 6010/7471B.

J - Estimated value below the lowest calibration point. Confidence correlates with concentration.

O - Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

SDL = Sample Detection Limit

Bold indicates concentrations in exceedance of applicable PCL

Any VOC analyte not listed was below the sample detection limit.

--- = No value available