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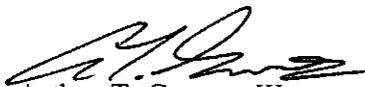
February 16, 2015

RE: Interim Authorization Corrective Action Plan Implementation, Meadows of Dan Food Market,
PC#2014-2256

Mr. Carl,

Enclosed is a copy of the Interim Authorization Corrective Action Plan Implementation Report for the Meadows of Dan Food Market facility located at 2609 Jeb Stuart Highway, Meadows of Dan, Virginia (PC#2014-2256. Also included is a copy of the pre-approved AAF with the work performed units completed. Should you have questions regarding the enclosed material, or if additional information is required, please feel free to contact me at (540) 483-3311.

Sincerely,


Arthur T. Greene, III
Owner

Enclosures



IA CAP IMP Meadows of Dan Food Market PC# 2014-2256

**INTERIM AUTHORIZATION
CORRECTIVE ACTION PLAN
IMPLEMENTATION**

Meadows of Dan Food Market
2609 Jeb Stuart Highway
Meadows of Dan, Virginia 24120

PC# 2014-2256
Greene Project# FMMD1004

February 13, 2015

DEQ Case Manager:
Mr. Douglas B. Carl

**INTERIM AUTHORIZATION
CORRECTIVE ACTION PLAN
IMPLEMENTATION**



**Meadows of Dan Food Market
2609 Jeb Stuart Highway
Meadows of Dan, Virginia 24120
PC# 2014-2256**

Submitted To:

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Commonwealth of Virginia
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Arthur T. (Trev) Greene, III
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EXECUTIVE SUMMARY

Interim Authorization Corrective Action Plan

Based on the findings of the Site Characterization & Reporting Addendum (SCRA) and the previously performed phases of work, Greene requested to perform Corrective Action Plan Implementation (CAP IMP) activities under Interim Authorization (IA) prior to full completion of site characterization. In a letter dated June 11, 2014, the Virginia Department of Environmental Quality (VA DEQ) authorized the performance of IA CAP IMP activities at the subject site. In an effort to complete characterization of the free phase plume, Greene installed nine additional soil borings/monitoring wells during this phase of investigation. Free phase plume mapping generated during IA CAP IMP activities, likely indicates the free phase plume has been fully delineated to the extents practical based on current site conditions. Further, the free phase plume mapping indicates a free product plume extending northeast-southwest approximately 200 feet, and measurable free product thicknesses have been observed within 15 (MW01A, MW02, MW03, MW07, MW12, MW14, MW15, MW19, MW21, MW22, MW23, MW24, MW25, MW26, and MW28) of the 28 monitoring wells. In an effort to reduce the observed free phase petroleum, six vacuum truck recovery events and a 14-Day Dual Phase Extraction (DPE) Pilot Study Event were performed at the property during this phase of work and approximately 29,175 gallons of free product and highly concentrated dissolved phase petroleum contamination were recovered during this phase of investigation.

Groundwater samples collected from the 28 monitoring wells confirmed the presence of onsite and offsite dissolved phase petroleum contamination in the shallow groundwater. Based on the free phase petroleum plume maps and the Isoconcentration maps generated during this phase of investigation, free product movement appears to be primarily to the southwest, which is contrary to the observed hydraulic gradient to the southeast. It is likely groundwater flow is also affected by the same anisotropic condition, and if so groundwater flow would be primarily to the southwest. Analytical results of drinking water samples collected from receptor IDs DW01, DW07/DW08, DW13, DW14, DW16, MW17, and DW19 yielded Non Detected for all analytes at laboratory method detection limits. However, pre-filtration drinking water samples continue to yield the presence of petroleum contamination at receptor IDs ~~MW02~~, ~~MW03~~, ~~MW12~~, and ~~MW15~~. Surface water samples were not collected during this phase of investigation; however, based on the limited fate and transport modeling performed during the previous phase of investigation there remains potential for surface water impact from the observed petroleum contamination.

As part of IA CAP IMP activities, Greene prepared the site for long term utilization of remediation technology to address the observed petroleum contamination observed both onsite and offsite. Subsequent to completing

the trenching and subsurface pipe installation, Greene then performed a 14-day DPE Pilot Study Event at the Meadows of Dan Food Market facility. The DPE remediation system operated for a total of 318.5 hours during the 14-Day Pilot Study Event and recovered a total of 27,838 gallons of free product and groundwater. In addition, an estimated total of 4,355.20 pounds of hydrocarbon contamination was recovered in the vapor phase and an estimated total of 19.38 pounds of hydrocarbon contamination was recovered in the dissolved phase during the 14-Day Pilot Study Event. It should be noted that no dissolved phase analytical data was obtained during the individual well phase of the pilot study. Approximately 50-gallons of free phase petroleum were recovered during the event. Throughout the entire pilot study significant areas of influence and groundwater drawdown were observed likely indicating acceptable communication throughout the subsurface soils. Based on the information obtained during this pilot study, DPE remediation technology appears to be the most cost effective means of long term corrective action for the Meadows of Dan Food Market facility. However, details concerning the remediation feasibility and remedial endpoints will be discussed in much greater detail during the CAP Development Phase.

As a result of completing IA CAP IMP activities, Greene recommends initiating CAP Development. As part of CAP Development, Greene will obtain any federal, state, or local permits required to implement the CAP. (In addition, Greene will perform a free product transmissivity investigation at the subject site.) However, prior to initiating the transmissivity study, Greene recommends allowing subsurface conditions to equilibrate to increase the accuracy of the investigation. Subsequent to completing the transmissivity study, Greene also recommends resuming monthly vacuum truck free product recovery events at the Meadows of Dan Food Market facility. Further, Greene recommends the collection of surface water samples and additional drinking water sampling be performed. Greene recommends collecting surface water samples from the pond and two intermittent tributaries to Tuggle Creek to confirm the presence or absence of petroleum impact. Finally, Greene recommends obtaining a drinking water sample from the shared supply well providing potable water to receptor IDs DW04, DW05, and DW06 once access has been granted. In addition, Greene recommends the continued sampling of onsite drinking water well (DW01) and the drinking water at receptor IDs DW07/DW08, DW13, DW14, DW16, DW17, and DW19.

This Executive Summary is an integral part of the Interim Authorization Corrective Action Plan Implementation. Greene recommends that the report be read in its entirety.

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Soil Boring Logs/Monitoring Well Construction Diagrams

D. Laboratory Data

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Chain of Custody Documentation

E. Soil Disposal Documentation

Non-Hazardous Materials Manifests – EVO Corporation
Certificates of Disposal – EVO Corporation

F. Liquid Disposal Documentation

Non-Hazardous Materials Manifest – EVO Corporation
Certificate of Disposal – EVO Corporation
Vacuum Truck Bill of Lading – Environmental Options, Inc.

G. Associated Documents

VA DEQ Approval Letter Dated June 11, 2014
Site Access Agreements – Soil Boring/Monitoring Well Installation
Site Access Agreements – Remediation System Groundwork Installation

H. 14-Day Pilot Study Event

Calculation Sheets for Hydrocarbon Recovery
Calculation Sheet for Air Stripper Efficiency

**INTERIM AUTHORIZATION
CORRECTIVE ACTION PLAN IMPLEMENTATION**
for
Meadows of Dan Food Market
Meadows of Dan, VA

1.0 Introduction

On December 30, 2013, Paul R. Shively, Inc. (PRS) of Floyd, Virginia contracted Greene Environmental Services, LLC (Greene) to collect the required samples and document the removal of two 10,000-gallon gasoline underground storage tanks (USTs) located at the Meadows of Dan Food Market in Meadows of Dan, Virginia. Soil samples collected during the excavation and removal of the USTs revealed elevated volatile organic compound (VOC) vapors typically associated with petroleum fuels. Greene also observed petroleum stained soils on the former shared UST basin sidewalls and floor. Subsequent to these findings, Greene reported the release to the Blue Ridge Regional Office (BRRO) of the Virginia Department of Environmental Quality (VA DEQ) on December 30, 2013. In a letter dated January 6, 2014, the Roanoke branch of the Blue Ridge Regional Office (BRRO-ROA) issued the site Pollution Complaint (PC) #2014-2256 and requested that Initial Abatement Measures and Reporting (IAMR) activities and Site Characterization and Reporting (SCR) activities be conducted at the site. During the IAMR, a total of 409.92 tons of petroleum impacted soils were removed from the site and disposed of at a treatment facility. In addition, Greene collected soil samples subsequent to overexcavation activities, which indicated that elevated petroleum contamination remained onsite. Subsequent to completion of this phase of work, a copy of the IAMR dated January 24, 2014 was submitted to the VA DEQ.

As requested in the January 6, 2014 VA DEQ letter, Greene then performed SCR activities at the subject site. Greene installed six onsite monitoring wells, performed aquifer characterization, and performed sampling activities. During the SCR phase of work, measurable vapor phase, residual phase, dissolved phase, and free phase petroleum contamination were observed at the Meadows of Dan Food Market property. In addition, drinking water samples collected from the offsite receptor IDs DW02 (Poor Farmer's Market), DW03 (Jane's Country Café), DW12 (Spangler Residence), and DW15 (Nancy's Candy Company) yielded measurable dissolved phase petroleum contamination and carbon filtration units were installed as part of the VA DEQ alternate water supply (AWS) program. Subsequent to completion of the site characterization phase of work, a copy of the SCR dated April 18, 2014 was submitted to the VA DEQ.

Based on the findings of the SCR, the VA DEQ requested SCR Addendum (SCRA) activities be performed at the Meadows of Dan Food Market property. During the SCRA phase of work, Greene installed 14 monitoring wells at the subject site and adjacent properties, performed aquifer characterization, free product recovery, and

sampling activities. In addition, 10 vacuum truck recovery events were performed at the property and approximately 2,625 gallons of free product and highly concentrated dissolved phase petroleum contamination were recovered. Subsequent to completion of the site characterization addendum phase of work, a copy of the SCRA dated July 11, 2014 was submitted to the VA DEQ.

Based on the findings of the SCRA and the previously performed phases of work, Greene determined corrective action would be required at the Meadows of Dan Food Market. As a result, Greene requested to perform Corrective Action Plan Implementation (CAP IMP) activities under Interim Authorization (IA) prior to full completion of site characterization in a letter dated June 5, 2014. In a letter dated June 11, 2014, the VA DEQ authorized the performance of IA CAP IMP activities at the subject site. The following report summarizes the IA CAP IMP activities performed at the Meadows of Dan Food Market. A copy of the VA DEQ approval letter dated June 11, 2014 is included in Appendix G of this report.

2.0 Site Assessment

2.1 Site Location and Description

The subject property is an approximately 1.07-acre parcel located at 2609 Jeb Stuart Highway in a primarily commercial and residential area within the limits of Patrick County, Virginia. The subject site is improved with a two-story building that serves as the Meadows of Dan Food Market, as well as a coin-operated laundromat and rental apartment. It is believed that the subject site has operated as a retail gasoline station and convenience store from approximately 1976 to present. As part of UST system upgrade activities, one 10,000-gallon regular gasoline UST (UST #1) and one 10,000-gallon premium gasoline UST (UST #2) located within a common basin were removed from the ground on December 30, 2013. The subject site currently maintains one 10,000-gallon gasoline UST and one 8,000-gallon compartmental UST containing gasoline and kerosene. In addition, the property maintains two gasoline dispensers and one kerosene dispenser. The subject site is further improved with asphalt access and parking areas. (The Meadows of Dan Food Market obtains potable water from a drilled supply well located within the store building approximately 75 feet northwest of the former tank basin.) The subject site is bordered by Jeb Stuart Highway to the south, Baptist Church Lane to the north, and commercial properties to the east and west. A Site Map (11/05/14) documenting pertinent features of the site and surrounding area is included in Appendix B.

2.2 Topography

The subject site is located at 2609 Jeb Stuart Highway within the limits of Patrick County, Virginia. According to the U.S. Geological Survey 7 ½ Minute Series Topographic Map of the Meadows of Dan

Quadrangle, Virginia, the site elevation is approximately 2,968 feet above mean sea level. At its closest point, the nearest identified surface water body, an unnamed intermittent tributary to Tuggle Creek, is located approximately 950 feet to the east. An aerial map and topographic map of the subject site are included in Appendix B.

2.3 Local Geology

Greene reviewed the Geologic Map of Virginia prepared by the Commonwealth of Virginia, Department of Mines, Minerals, and Energy. Published geologic information indicates that local geologic structures are primarily comprised of rocks of the Alligator Back Formation. This rock formation is described by Espenshade et al (1975) as consisting of finely laminated gneiss with thick layers of schist, phyllite, amphibolite, or greenstone. Specifically, the site lies within the aba sub-unit of the Alligator Back Formation, which consists of amphibolite, garnet amphibolite, and greenstone interbedded with biotite-muscovite gneiss and metapelite. The strike of the mapped contact between the Alligator Back formation and the aba sub-unit is approximately 78 degrees.

The micaceous nature of the underlying geology is evident in the soils encountered during drilling, where the relict structure of the rocks is preserved in the residual soils. The soils were observed to be mica rich with relict bands of quartz which are common in gneissic and schistose rocks. During trenching activities performed as part of IA CAP IMP activities, the strike of the metamorphic foliations was measured by Greene to be 68-70 degrees, consistent with the mapped strike of the formation contacts. The dip of the foliations was measure to be 79 degrees to the southeast. The metamorphic foliations exert a strong influence on the migration of free product and dissolved phase hydrocarbons at the site. This is evidenced by the marked disparity between the observed groundwater gradient and the observed plumes, which is not unusual in geologic environments with strong geologic structures. The groundwater gradient in the vicinity of the subject site is approximately 166 degrees, becoming slightly more eastward to the south. In contrast, the observed plumes are oriented almost 90 degrees to the direction of groundwater gradient.

3.0 Interim Authorization Corrective Action Plan Implementation Activities

Based on the significant free phase and dissolved phase petroleum plumes and the confirmed petroleum impact to drinking water wells in the area, Greene performed IA CAP IMP activities at the Meadows of Dan Food Market facility. This phase of work included soil boring and groundwater monitoring well installation in an effort to complete characterization of the free phase plume, preparation of the site for long term utilization of an appropriate remediation technology, the performance of a pilot study to determine the most appropriate remediation technology, groundwater sampling, and laboratory analysis. In addition, multiple vacuum truck

free phase petroleum recovery events were performed at the site. A summary of the IA CAP IMP activities performed at the Meadows of Dan Food Market is provided in the following sections.

3.1 Soil Boring Installation

On July 31, 2014, Greene initiated an additional subsurface investigation at the Meadows of Dan Food Market property in an effort to delineate the free phase petroleum plume. Greene contracted Davidson Drilling, Inc. (DDI) to install nine soil borings/monitoring wells at the subject site from July 31, 2014 to August 4, 2014. DDI utilized a track-mounted, direct push drill rig equipped with continuous-flight steel rods to install the soil borings until rod refusal was observed. Subsequent to observing rod refusal, DDI converted the direct push drill rig to hollow-stem auger or utilized a truck-mounted hollow-stem auger drill rig and over-bored the nine soil borings (B020-B28) to approximately 10 feet below the first indication of the shallow groundwater table to facilitate the construction of groundwater monitoring wells.

During installation of the nine soil borings, Greene collected soil samples at five foot intervals. The soil samples were collected for visual inspection, lithologic characterization, and headspace screening for the presence of VOC vapors typically associated with petroleum fuels. Portions of each soil sample recovered were retained in plastic Zip-Loc™ bags for headspace analysis. Sample temperature was allowed to equilibrate for approximately fifteen minutes at a minimum temperature of 68 °F prior to screening. Headspace screening was performed using a Mini-RAE 3000 photoionization detector (PID) calibrated to a 100 parts per million (ppm) isobutylene standard. This instrument detects VOC vapors within a range of 0.1 ppm to 15,000 ppm. Headspace analysis involved the insertion of the sample probe portion of the PID into the equilibrated sample bag. The maximum reading obtained upon insertion of the probe was recorded for each sample. Headspace analyses revealed elevated (>50.0 ppm) VOC vapor concentrations at soil borings B21, B22, B23, B25, B26, and B28. Headspace readings are included on the Soil Boring Logs provided as Appendix C. The soil boring locations are included on the Soil Boring Location Map provided in Appendix B.

The nine soil borings were installed in an effort to complete delineation of the free phase petroleum plume originating from the subject site. Greene installed soil borings B21, B22, B25, B26, and B28 on the Meadows of Dan Food Market property; however, soil borings B23, B24, and B27 were installed on the Former Mountain House Restaurant property located east of the subject site and addressed as 2639 Jeb Stuart Highway. In addition, soil boring B20 was installed on the Jane's County Café property addressed as at 2588 Jeb Stuart Highway. As part of the previously performed SCRA activities, Greene obtained Site Access Agreements from the Former Mountain House Restaurant and Jane's County Café property owners to allow for the installation of the soil borings. The borings predominantly consisted of well graded, weathered, micaceous

silty fine sand from approximately grade to 45-55 feet below the ground surface (bgs). Soil cuttings were drummed and stored onsite prior to disposal by EVO Corporation (EVO) of Winston-Salem, NC on August 8, 2014. Copies of the Non-Hazardous Waste Manifests and Certificates of Disposal for the 27 drums are included in Appendix E. Copies of the signed Site Access Agreements are included in Appendix G.

3.2 Groundwater Monitoring Well Installation

Greene completed soil borings B20-B28 as groundwater monitoring wells MW20-MW28, respectively. Groundwater monitoring wells were installed to collect groundwater samples and to monitor for the presence of free product. Groundwater monitoring wells were constructed using two-inch inner diameter (I.D.) schedule 40 polyvinyl chloride (PVC) casing and 0.010-inch factory-slotted well screen. Each well is equipped with an expansion-type locking well cap. Well construction was completed subsequent to removal of the augers. The well annulus was filled with washed, #3 quartz filter sand to a minimum depth of approximately two feet above the top of the screened interval. A pelletized bentonite seal was placed above the sand filter pack. The remainder of the annulus was completed with neat portland grout. A flush-mount protective well cover was installed over each of the nine monitoring wells. The monitoring well locations are included on the Monitoring Well Location Map provided in Appendix B. Monitoring well construction diagrams are included on the Soil Boring Logs provided as Appendix C.

Subsequent to the installation of each monitoring well, Greene utilized a Heron Instruments, Inc. (Heron) electronic interface probe to confirm the presence of groundwater and/or free product. Measurable free product thicknesses were observed within monitoring wells MW21, MW22, MW23, MW25, and MW28 immediately following installation. In addition, Greene observed measurable free product in the newly installed monitoring well MW26 prior to performing well development. Due to the continued presence of measureable free product, Greene returned to the subject site on October 16, 2014 with a vacuum truck under contract from Environmental Options, Inc. (EO) of Rocky Mount, VA to perform well development and free product removal activities. Following the recording of the pre-test static water level, reinforced tubing and buried PVC piping installed as part of IA CAP IMP activities were utilized to perform well development/free product recovery activities. The vacuum truck was utilized to develop the wells without free product, MW20, MW24, and MW27 for approximately 20, 10, and 30 minutes, respectively. Due to the presence of measureable free product thicknesses, the vacuum truck was utilized to develop MW21, MW22, MW23, MW25, MW 26, and MW28 for approximately 20-30 minutes each. Additional information regarding the free product recovery event is provided in Section 4.4.4.

3.3 Hydrogeology

In accordance with VA DEQ directives, Greene completed nine additional exploratory soil borings as groundwater monitoring wells (MW20-MW28) from July 31, 2014 to August 4, 2014. Groundwater monitoring wells were installed to monitor for the presence of free phase petroleum and to delineate the dissolved phase petroleum compounds identified onsite and offsite. A mark placed on the top of each well casing was used as a reference point for surveying and recording groundwater elevations. Greene used a Heron electronic interface probe to measure the depth to groundwater in the onsite and offsite monitoring wells during 10 gauging events performed during IA CAP IMP activities. A summary of historic and current groundwater elevation data is presented in Table 1 included in Appendix A pages 1-13.

Groundwater elevation data collected during the sampling event performed on November 5-6, 2014 was selected for the generation of a potentiometric surface map. The Surfer Version 11.6 program was employed to generate the potentiometric surface contour array over the base map created in DesignCAD. A minimum of pseudo data points were used and these were applied only when the kriging algorithm clearly interpolated the contour lines into certain regions where a paucity of data resulted in an unnatural contour distribution. When pseudo points were used, they were based on nearest neighbors. The potentiometric surface map generated from the relative elevations of equilibrated groundwater as measured on November 5-6, 2014 is included in Appendix B. Relative groundwater elevations measured on November 5-6, 2014 depict a primarily southeast hydraulic gradient. However, based on the free phase petroleum plume maps and the Isoconcentration maps generated during this phase of investigation, free product movement appears to be primarily to the southwest, which is contrary to the observed hydraulic gradient to the southeast. It is likely groundwater flow is also affected by the same anisotropic condition, and if so groundwater flow would be primarily to the southwest. As discussed in Section 2.3 this is likely due to the schistose bedrock, which gives rise to micaceous soils with relict structure that retain the northeast-southwest orientations.

3.4 Contamination Characterization

The following sections describe Greene's delineation of subsurface petroleum constituents detected during this investigation.

3.4.1 Vapor Phase

It should be noted that a true soil gas survey has not been conducted at this site. Any discussion of soil vapors pertains to PID readings observed during the screening of soil samples collected during borehole logging. As such, any readings are indicative of a mixture of soil gases and the newly volatilized petroleum vapors resulting from the disturbance of residual phase contamination.

Nevertheless, vapor phase contamination is expected to exist beneath the site. As part of soil boring installation activities, Greene collected soil samples from each of the boring locations at five foot intervals. Clean, disposable nitrile gloves were used during all phases of sample collection. The soil samples were collected for visual inspection, lithologic characterization, and headspace screening for the presence of VOC vapors typically associated with petroleum fuels. Portions of each recoverable soil sample were retained in plastic Zip-Loc™ bags for headspace analysis. Sample temperature was allowed to equilibrate for a minimum period of fifteen minutes at a minimum temperature of 68°F prior to screening. All soil samples were field screened using a Mini-RAE 3000 PID and visual and olfactory clues. Headspace analyses revealed elevated (>50.0 ppm) VOC vapor concentrations at borings B21, B22, B23, B25, B26, and B28. Headspace readings are included on the Soil Boring Logs provided as Appendix C. A summary of the field screening results is presented in Table 2 included in Appendix A pages 14-16.

3.4.2 Residual Phase

During drilling activities, soil samples were collected from the B20-B28 boring locations at approximately five foot intervals. The soil samples were collected using, clean, disposable nitrile gloves, placed in 4 ounce glass soil jars, placed on ice, entered onto a chain of custody document, sealed inside a shipping cooler on ice, and shipped by overnight express to TestAmerica, Inc. of Nashville, TN. The soil samples were analyzed for total petroleum hydrocarbons-gasoline range organics (TPH-GRO) and TPH-diesel range organics (DRO) via EPA method 8015B, benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tert-butyl ether (MTBE), and naphthalene via EPA method 8021B. Copies of the laboratory results and chain of custody documentation are included in Appendix D. In the interest of reducing paper waste, the quality assurance/quality control (QA/QC) sections of the laboratory reports have not been included with this report. QA/QC documentation has been retained in-house and will be provided upon request.

Analytical results of the submitted soil samples yielded evidence of elevated residual phase petroleum contamination at soil boring locations B21, B25, and B28. Limited residual phase contamination also was observed at soil boring locations B22, B23, B24, B26, and B27. The residual phase contamination was primarily observed proximal to or within the smear zone at each boring location. However, residual phase contamination was observed from approximately 5-35 feet bgs at soil boring B25 located proximal to the kerosene/gasoline dispensers. The presence of residual phase contamination approximately five feet bgs at soil boring B25 may indicate an additional release of petroleum associated with the kerosene/gasoline dispensers and/or associated product piping at the Meadows of Dan Food Market property. Soil samples collected from soil boring B20 did not yield any evidence of residual phase petroleum contamination. A summary of the residual phase analytical results is presented in Table 3 included in Appendix A pages 17-18.

3.4.3 Dissolved Phase

As discussed in Section 4.2, monitoring wells MW20-MW28 were developed on October 16, 2014. Prior to developing the wells, Greene recorded static water level and investigated for the presence of free phase petroleum using a Heron electronic interface probe. The depth to product/groundwater measurement was recorded from a reference mark placed on the top of each well casing. A summary of the well development gauging event is presented in Table 4 included in Appendix A pages 19-21. Greene returned to the subject site on November 5-6, 2014 to collect groundwater samples from the onsite and offsite groundwater monitoring wells. Prior to purging and sampling, Greene recorded the static water level and investigated for the presence of free phase petroleum using a Heron electronic interface probe. The depth to product/groundwater measurements were recorded from a reference mark placed on the top of each well casing. Measurable free product thicknesses were observed within monitoring wells MW01A, MW02, MW03, MW12, MW14, MW15, MW19, MW21, MW22, MW23, MW24, MW25, MW26, and MW28 respectively. A summary of the sampling gauging event also is presented in Table 4 included in Appendix A pages 19-21.

Despite the presence of free phase petroleum within monitoring wells MW01A, MW02, MW03, MW12, MW14, MW15, MW19, MW21-MW26, and MW28, Greene collected groundwater samples from beneath the free product layer. The groundwater samples were collected to obtain dissolved phase analytical data to be utilized to generate Isoconcentration maps. Groundwater samples were collected from wells with free product using dedicated, disposable, HDPE bailers and were transferred directly into the appropriate sample containers. Clean, disposable nitrile gloves were used during all phases of sample collection. All water samples were collected in glass sampling bottles, entered onto a chain of custody document, sealed inside a shipping cooler on ice, and shipped overnight to TestAmerica, Inc. of Nashville, TN.

Prior to sampling monitoring wells MW04-MW11, MW13, and M16-MW18, Greene purged the wells to remove suspended solid material from the water column and to collect samples representative of aquifer conditions. The 12 monitoring well groundwater samples were collected using a 12-volt S.S. Monsoon Proactive Environmental Products submersible pump with a low-flow controller. Dedicated, disposable, LDPE tubing was used to purge the wells and transfer the groundwater samples directly into the appropriate sample containers. The monitoring wells were purged until dry or a minimum of three well volumes had been displaced. Clean, disposable nitrile gloves were used during all phases of sample collection. All water samples were collected in glass sampling bottles, entered onto a chain of custody document, sealed inside a shipping cooler on ice, and shipped overnight to TestAmerica, Inc. of Nashville, TN. The groundwater samples collected from monitoring wells MW01A-MW28 were submitted for TPH-GRO analysis via EPA method 8015B, BTEX, MTBE, and naphthalene analysis via EPA method 8021B. Copies of the laboratory

results and chain of custody documentation are included in Appendix D. In the interest of reducing paper waste, the QA/QC sections of the laboratory reports have not been included with this report. QA/QC documentation has been retained in-house and will be provided upon request.

Analytical results of groundwater samples collected from the monitoring wells yielding evidence of free product during this phase of investigation (MW01A, MW02, MW03, MW12, MW14, MW15, MW19, MW21-MW26, and MW28) yielded measurable TPH-GRO, BTEX, and MTBE concentrations. In addition, laboratory results from the wells with free product, except for MW02, yielded measurable naphthalene concentrations. Analytical results of the groundwater samples collected from the hydraulically downgradient monitoring wells, MW04 and MW05, yielded measurable concentrations of TPH-GRO, TPH-DRO, BTEX, and MTBE. In addition, laboratory results from MW05 yielded a measurable naphthalene concentration. The groundwater sample collected from the onsite hydraulically upgradient monitoring well, MW06, yielded TPH-GRO, BTEX, and MTBE concentrations. The groundwater samples collected from the offsite monitoring wells MW13 and MW16 yielded a measurable MTBE concentrations. The groundwater samples collected from the offsite monitoring wells MW10 and MW20 yielded limited TPH-GRO and MTBE concentrations. Analytical results from MW11 yielded limited benzene, toluene, and MTBE concentrations. Groundwater samples collected from the offsite monitoring wells MW08, MW09, MW17, and MW18 yielded Non Detected for all an:

Plume Direction

During this phase of investigation, Isoconcentration maps were generated from the monitoring well groundwater analytical results. Due to the observed anisotropy discussed in Section 2.3, the Isoconcentration maps were constructed using a kriging algorithm in Surfer version 11.6, with anisotropy introduced into the kriging consistent with the observed anisotropy of the aquifer. It should be noted that the distribution of the data points used in the contouring may suggest less symmetry of the plumes than actually exists. Specifically, with the anisotropy oriented slightly north of east, there are generally more data points to the north and east than to the west and south because of the presence of US 58. Therefore, the plumes may appear more "blunt" in the westerly direction than they would if an equal number of data points occurred in that direction. Based on Isoconcentration maps generated during this phase of investigation, the dissolved phase petroleum plume appears to be migrating northeast-southwest, which is contrary to the observed hydraulic gradient trending to the southeast. However, based on the monitoring points available it is unknown if the dissolved phase plume and shallow groundwater are truly migrating to the southwest or if the observed migration of free phase petroleum to the southwest is resulting in a dissolved phase plume based on primarily the presence of free product. A summary of the historic and current monitoring well dissolved phase analytical results is presented

in Table 5 included in Appendix A pages 22-23. Copies of the Isoconcentration maps for TPH-GRO, BTEX, MTBE, naphthalene, and total RTEX are provided in Appendix B.

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How determined shared well?
wells on properties
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les also were collected from multiple supply
om the supply well located at receptor ID DW16
water samples from the receptor ID DW16 supply
ember 7, 2014, Greene collected drinking water
l, DW13, DW14, and DW17, and from the spring
ddition, Greene collected drinking water samples
ID DW19 on November 20, 2014. Greene was
unable to collect a groundwater sample from the shared supply well providing potable water to receptor IDs
DW04/DW05/DW06 due to the properties being vacant. During this phase of investigation, Greene made
multiple phone calls to the receptor ID DW04 and receptor ID DW06 property owners/managers and was
unable to secure access to collect a drinking water sample from the supply well located on the receptor ID
DW04 property. The supply well located at the receptor ID DW04 property is located downgradient to the
observed free phase and dissolved phase plumes. As a result, Greene will continue efforts to collect a drinking
water sample from the receptor ID DW04 property supply well. Clean, disposable nitrile gloves were used
during all phases of sample collection. All drinking water samples were collected in glass sampling bottles,
entered onto a chain of custody document, sealed inside a shipping cooler on ice, and shipped overnight to
TestAmerica, Inc. of Nashville, TN. The drinking water samples collected from receptor IDs DW01, DW07,
DW13, DW14, DW17, and DW19 were submitted for volatile organic compounds (VOCs) analysis via EPA
method 8260B. The drinking water samples from receptor ID DW16 were submitted for VOCs analysis via
8260B and semi-volatile organic compounds (SVOCs) analysis via EPA method 8270C. Analytical results of
the drinking water samples collected from receptor IDs DW01, DW07, DW13, DW14, DW16, DW17, and
DW19 yielded Non Detected for petroleum contamination at laboratory method detection limits during this
phase of investigation. However, the drinking water sample collected from receptor ID DW16 on August 1,
2014 yielded a chloroform concentration of 1.84 µg/L. Chloroform is not typically associated with petroleum
products and its presence within the receptor ID DW16 supply well is likely not related to the release of
gasoline at the Meadows of Dan Food Market. In addition, the observed result is well below the maximum
contaminant level goal (MCLG) of 70.0 µg/L established by the United States Environmental Protection
Agency (US EPA). The presence of chloroform in well water is likely a byproduct of the reaction between
chlorine used to treat the groundwater and naturally occurring organic matter. A summary of the historic and
current drinking water dissolved phase analytical results is presented in Table 6 included in Appendix A pages
24-26. Copies of the laboratory results and chain of custody documentation are included in Appendix D. In

the interest of reducing paper waste, the QA/QC sections of the laboratory reports have not been included with this report. QA/QC documentation has been retained in-house and will be provided upon request.

During the initial SCR phase of work, Greene confirmed the presence of petroleum impact at receptor IDs DW02 (Poor Farmer's Market), DW03 (Jane's Country Café), DW12 (Spangler Residence), and DW15 (Nancy's Candy Company). To mitigate concern associated with ingestion of petroleum impacted drinking water, carbon filtration unit (CFU) systems were installed at each of these properties as part of the VA DEQ Alternate Water Supply (AWS) program. As part of the CFU system installation and maintenance activities pre-treatment drinking water samples are routinely collected. The VA DEQ AWS program approved contractor collected pre-filtration drinking water samples from receptor ID DW02 and receptor ID DW15 on August 26, 2014 and December 18, 2014 and from receptor ID DW03 and receptor ID DW12 on October 30, 2014. Analytical results of the pre-filtration drinking water samples collected on behalf of the VA DEQ AWS program continue to yield measurable levels of dissolved phase contamination. The drinking water samples collected from receptor ID DW02 (Poor Farmer's Market), yielded MTBE concentrations of 33.5 µg/L and 14.9 µg/L. Drinking water samples collected from receptor ID DW15 (Nancy's Candy Company) yielded MTBE concentrations of 25.2 µg/L and 17.3 µg/L. The samples collected from receptor ID DW03 (Jane's Country Café) and receptor ID DW12 (Spangler Residence) yielded MTBE concentrations of 63.5 µg/L and 3.5 µg/L, respectively. In addition, tert-Amyl methyl ether (TAME), benzene, Diisopropyl ether (DIPE), and xylenes concentrations of 0.8 µg/L, 6.7 µg/L, 4.6 µg/L, and 7.9 µg/L were observed in the sample collected from receptor ID DW03. Greene obtained the analytical results collected on behalf of the VA DEQ AWS program included in this report from Mr. Harmon Fisher with the VA DEQ AWS program. Copies of the laboratory results and chain of custody documentation for the samples collected on behalf of the VA DEQ AWS program are not included in this report and any request for this documentation should be made to the VA DEQ AWS program. A summary of the historic and current drinking water dissolved phase analytical results is presented in Table 6 included in Appendix A pages 24-26.

3.4.4 Free Product

During this phase of investigation measurable free product was observed at monitoring wells MW01A, MW02, MW03, MW07, MW12, MW14, MW15, MW19, MW21-MW26, and MW28. Greene generated a free product plume map utilizing product thicknesses observed on November 5, 2014 subsequent to allowing subsurface conditions to equilibrate for approximately three weeks. In addition, Greene generated a second free phase product plume map utilizing the highest product thicknesses observed during any phase of investigation. Both maps indicate a free product plume extending northeast to southwest approximately 200 feet. Due to observed anisotropy at the site, the contour maps were constructed using a kriging algorithm in

Surfer version 11.6, with anisotropy introduced into the kriging consistent with the observed anisotropy of the aquifer. It should be noted that the distribution of the data points used in the contouring may suggest less symmetry of the plumes than actually exists. As discussed in Section 2.3, the free product plume appears to be migrating contrary to the observed hydraulic gradient to the southeast due to the foliations in the rock and the micaceous soils with relict structure appear to be primarily controlling the migration of free phase petroleum product. Copies of the Free Phase Petroleum Plume Maps are included in Appendix B. A summary of the historic and current free product thicknesses is presented in Table 7 included in Appendix A pages 27-33.

Due to the continued presence of measurable free phase petroleum, Greene continued the performance of free product recovery events utilizing a vacuum truck at the subject site. Greene performed six gauging events and vacuum truck recovery events at the Meadows of Dan Food Market facility during this phase of investigation. Vacuum truck recovery events were performed on July 1, July 10, July 16, July 24, July 30, and October 16, 2014. The vacuum trucks for these recovery events were provided under contract by EVO or EO. Following the recording of the free product thicknesses, reinforced tubing and PVC pipe installed below the groundwater were utilized to apply the vacuum within monitoring wells observed to have free product during the gauging event. The vacuum was applied to the monitoring wells until no measurable free product remained or primarily groundwater was being recovered. Additional free product and petroleum impacted groundwater were recovered as part of the 14-Day Pilot Study Event performed during IA CAP IMP activities; however, further discussion of the pilot study is provided in Section 4.6 of this report. A summary of the product recovery events including the 14-Day Pilot Study Event performed during this phase of work is presented in Table 8 included in Appendix A pages 34-37. Copies of the vacuum truck Bill of Lading, Non Hazardous Waste Manifests, and Certificates of Disposal generated during the free product recovery events are included in Appendix F.

During the initial SCR phase of investigation, Greene collected a sample of the free product within monitoring well MW02 on March 19, 2014. The free product sample was collected using a dedicated, disposable, HDPE bailer and was transferred directly into the appropriate sample containers. Clean, disposable nitrile gloves were used during all phases of sample collection. The product sample was collected in glass sampling bottles, entered onto a chain of custody document, sealed inside a shipping cooler on ice, and shipped overnight to Southern Petroleum Laboratories, Inc. (SPL) of Houston, TX. The product sample was submitted for paraffins, isoparaffins, aromatics, naphthenes, and olefins (PIANO) analysis including BTEX, MTBE, ethyl tert-butyl ether (ETBE), tert-Amyl methyl ether (TAME), diisopropyl ether (DIPE), and tert-Amyl alcohol (TAA), as well as a product identification narrative (PIN).

Laboratory analysis of the free product sample collected from MW02 confirmed that the product is a gasoline range hydrocarbon. The free product sample maintained a specific gravity of 0.7439 and a calculated octane of 89.530, which likely indicates the product is/was premium gasoline. As documented in the IAMR dated January 24, 2014, multiple small holes were observed on the bottom of the former premium UST located at the Meadows of Dan Food Market facility. In addition, the analytical results yielded the MTBE percentage by weight (wt %) of the sample to be 0.02. A summary of the free product analytical results is presented in Table 9 included in Appendix A page 38.

3.5 Well Modifications & Trenching Activities

As part of IA CAP IMP activities, Greene prepared the site for long term utilization of remediation technology to address the observed petroleum contamination observed both onsite and offsite. Greene selected 16 monitoring wells to be utilized as remediation system extraction wells at the facility. Monitoring wells MW01A, MW02, MW03, MW07, MW12, MW14, MW15, MW19, MW21-26, and MW28 were selected due to free product being observed within them. In addition, monitoring well MW27, which has never been found to contain observable free product, also was selected to be utilized as an extraction well in order to reduce the migration of the petroleum plume offsite. In an effort to reduce the day-to-day impact to the retail facility, dedicated 2" schedule 40 PVC piping was installed from monitoring wells MW01A, MW02, MW03, MW07, MW12, MW14, MW15, MW19, and MW21-MW28 in a series of shallow trenches to a 24" x 24" steel vault located in a grassy/gravel area on the north side of the property. In addition, the well covers for MW01A, MW02, MW03, MW07, MW12, MW14, MW15, MW19, and MW21-MW28 were removed and replaced with 24" x 24" steel vaults to allow for connection of the PVC piping to the well heads including the installation of the appropriate in-line metering and adjustment equipment. The steel vaults were set in concrete and resurfaced with concrete pads in an effort to eliminate shifting or settling due to the significant vehicle traffic at the facility. Approximate locations of the 24" x 24" vaults and the remediation trenching are provided on the Remediation System Groundwork Map included in Appendix B. A copy of the Site Access Agreement allowing for vault and trenching installation on the Former Mountain House Restaurant Property is included in Appendix G.

Greene contracted Paul R. Shively, Inc. (PRS) of Floyd, VA to provide equipment, operators, and additional personnel to perform the required asphalt/concrete saw-cutting, trench excavation, and backfilling activities as well as aid with piping and vault installation and at the Meadows of Dan Food Market facility from August 18, 2014 to August 28, 2014. PRS personnel utilized a cutoff saw and a walk-behind floor saw with concrete and asphalt blades to perform approximately 1,100 linear feet of saw cutting for the remediation trenches. Subsequent to saw cutting, a small excavator with a hydraulic breaker attachment was utilized to split the

asphalt and/or concrete within the trench line to allow for removal with a second small excavator. The removed asphalt and concrete was loaded directly into PRS and Greene dump trucks and transported offsite for disposal. Subsequent to removal of the asphalt/concrete, the small excavator was utilized to install a trench approximately 30-36 inches below grade to allow for the installation of the remediation system piping from the selected groundwater monitoring wells to a junction vault located on the north side of the property. In addition, hand excavation was utilized to remove the soils proximal to the monitoring wells. The removed soil was loaded directly into PRS and Greene dumps trucks and transported offsite for disposal.

Subsequent to removal of the soil, the trenching was bedded with approximately two inches of #8 stone prior to installing the PVC piping. PRS utilized a track-steer loader to place the #8 stone in the trench from a stockpile located on the north side of the property. A dedicated schedule 40 PVC pipe was then stubbed up adjacent to each of the monitoring wells selected for remedial efforts. The ends of the piping were plugged and a 24" x 24" steel vault was installed over each of the 16 selected monitoring wells and PVC remediation pipe pairs. Subsequent to installing and leveling the vaults, a concrete mixer was utilized to prepare ready-mix concrete slurry that was placed within and around the bottom of the vault in order to prevent settling due to the significant vehicle traffic on the property. PRS personnel then utilized the track-steer loader to backfill the trench to approximately six inches below grade with #8 stone. The track-steer loader was then utilized to backfill the remainder of the trench with crusher run material stockpiled on the north side of the property. Subsequent to completing backfilling activities additional saw cutting and concrete mixing was performed to install an estimated 8 inch concrete pad around each of the 24" x 24" vaults in order to prevent settling. In an effort to minimize the disturbance to the retail business and restaurant, Greene only performed trenching and pipe installation activities that could be completed in one day. At the end of each day the majority of the trench was backfilled and any open trench line was covered with steel road plates.

While installing the main trench line from the well locations to the termination vault, Greene observed evidence of potential septic water, likely originating from the laundromat and retail facility, entering the excavation. As a result, Greene contracted Helms Septic Service, LLC of Stuart, VA to remove the liquids from the excavation area and to empty the onsite septic tanks. Subsequent to removing the liquids, Greene completed installation of subsurface piping within the area as previously performed. However, concrete was utilized to backfill an estimated 10 foot section of trench line to approximately one foot below grade in an effort to prevent any additional septic water entering the excavation to drain towards the wells. The remainder of the trench was backfilled with #8 pea gravel and crusher run material. In addition, a bentonite seal was installed proximal to the termination vault to prevent impact from septic water. Following the completion of subsurface activities, Greene contracted C J Asphalt Paving, Inc. (C J Asphalt) of Boones Mill, VA to perform

resurfacing of the areas disturbed during excavation activities. On September 3, 2014, C J Asphalt removed the crusher run material and reportedly installed approximately four inches of asphalt to complete resurfacing activities. In addition, the sections of trench installed within concrete also were resurfaced and Greene installed two steel U-bollards proximal to the 24" x 24" steel vault where the PVC pipes were terminated.

Greene returned to the site on September 24, 2014 to install the necessary piping, valves, and gauges within the well vaults between the well heads and the subsurface PVC piping. Greene reduced the 2" schedule 40 PVC piping to 1" schedule 80 PVC piping to allow for the installation of an in-line ball valve, vacuum gauge, and sample port, as well as the necessary fittings between the subsurface piping and the well head. The ball valve, vacuum gauge, and sample port will be utilized to make adjustments during remediation system operation. In addition, the sample port also will be utilized to obtain magnehelic readings during system operation and pilot study activities. Subsequent to installation of the vault plumbing, Greene installed 1" schedule 40 PVC piping within the wells to aid in recovery of liquid and vapor during remediation activities. Greene completed vault plumbing activities on September 25, 2014.

3.6 Dual-Phase Extraction Pilot Study Event

Based on the perceived effectiveness of numerous vacuum truck recovery events performed at the Meadows of Dan Food Market facility, Greene selected Dual-Phase Extraction (DPE) as the remediation technology to be utilized to conduct a 14-Day Pilot Study Event. The pilot study was conducted in an effort to determine the feasibility of utilizing DPE as a remediation technology for recovering gasoline contamination at the subject site. The pilot study was separated into two phases; an eight day individual well pilot study event and a six day multiple well pilot study event. The individual well phase of the pilot study was performed in order to collect well specific recovery data, and the multiple well phase of the pilot study was performed in order to collect data more representative of the anticipated long term remediation effort. Throughout the entire pilot study Greene recorded measureable vacuum influence and drawdown resulting from system operation. The data obtained was utilized to generate radius of influence and drawdown mapping. A limited statistical analysis was utilized to eliminate any outliers to that data prior to generating the radius of influence and drawdown mapping. Due to observed anisotropy at the site, the contour maps were constructed using a kriging algorithm in Surfer version 11.6, with anisotropy introduced into the kriging consistent with the observed anisotropy of the aquifer. As discussed in Section 3.4.3, it should be noted that the distribution of the data points used in the contouring may suggest less symmetry of the plumes than actually exists.

Greene utilized a mobile DPE remediation system to perform the pilot study event. A mobile DPE remediation system was mobilized to the site on November 5, 2014 and following a day of set-up and the performance of a

gauging event, the system began operation on November 6, 2014. However, subsequent to operating for approximately 6.5 hours, the DPE system was shut down due to an electrical control panel malfunction. The damaged equipment was replaced and the system was restarted on November 13, 2014 and operated until November 26, 2014. The gauging event performed on November 5, 2014 was utilized to document the free product thicknesses and groundwater elevations within each of the 28 monitoring wells. The pilot study baseline groundwater elevations recorded on November 5-6, 2014 were utilized to determine the daily drawdown of the water table during system operation.

Throughout the 14-Day DPE Pilot Study Event, Greene performed monitoring of the remediation system components and the associated monitoring/recovery wells. Approximately once per hour while onsite, Greene documented the following:

- the rotary claw pump (RCP) vacuum from a gauge located on the vapor/liquid separator
- the temperature of the RCP vapor exhaust stream from a gauge installed in the vapor discharge piping
- the pressure differential utilizing pitot tubes installed in both the RCP influent and effluent vapor streams
- the RCP effluent VOC vapors from a sample port installed in the exhaust piping utilizing a PID
- the bag filter pressures from gauges installed pre-filter and post-filter
- the air stripper blower pressure from a gauge installed at the blower
- the air stripper pressure utilizing a magnehelic gauge
- the air stripper effluent VOC vapors from a sample port installed in the exhaust piping utilizing a PID
- the vacuum of the extraction well(s) at the remediation system manifold
- the vacuum of the extraction well(s) from the gauge(s) installed within the well vault(s)
- the vacuum of associated monitoring wells utilizing magnehelic gauges
- the volume of liquids discharged

In addition to data collection, Greene collected multiple vapor samples from the RCP and air stripper effluent streams, as well as influent and effluent water samples during the pilot study event. The vapor samples were collected from sample ports installed in the RCP and air stripper effluent piping. The air stripper vapor samples and PID readings were only obtained while water was being transferred from the oil/water separator into the air stripper. The water influent samples were collected from a sample port located along the piping that transfers water from the oil/water separator to the air stripper. The effluent water samples were collected from a sample port located on the piping that discharges water from the air stripper to the storage tanker.

3.6.1 Dual-Phase Extraction System Components

The mobile DPE remediation system utilized for the pilot study at the Meadows of Dan Food Market facility consisted of the following: three RCPs each with a 7.5-horsepower (HP) motor being operated in parallel to generate a flow rate of 450 cubic feet per minute (cfm) at a vacuum of 25 inches of mercury ("Hg); a RCP inlet manifold including all necessary piping, valves, and gauges; a 90-gallon vapor/liquid separator with all necessary piping, transfer pump and float switches; a 10 gallon per minute (gpm) oil/water separator with all necessary piping, transfer pump and float switches; a 55-gallon steel drum for product recovery; two #2 bag filter housings with 10 micron filters installed; a stackable plastic air stripper unit with a 3-HP blower and all necessary piping, transfer pump and float switches; and external control panel. System components were located within an 8' x 20' cargo trailer with intrinsically safe wiring. A 70-KW diesel generator provided temporary power to the system and a 9,900-gallon tanker trailer was utilized to temporarily store system effluent.

3.6.2 Individual Well Pilot Study Event

In order to collect well specific recovery data, the DPE remediation system was individually connected to monitoring wells MW21, MW03, MW28, MW26, MW22, MW02, MW14, and MW23 on November 6, November 13, November 14, November 15, November 16, November 17, November 18, and November 19, 2014, respectively. Greene utilized reinforced tubing, the previously installed subsurface PVC piping, and associated fittings to connect the extraction wells individually to the DPE remediation system. Throughout system operation, Greene measured and recorded the vacuum applied to the extraction well and system components, the vacuum influence and drawdown in the surrounding wells, and VOC vapors in the RCP and air stripper vapor effluent. In addition, Greene collected vapor samples from the RCP effluent stream approximately one hour, seven hours, and 24 hours subsequent to initiating extraction on an individual well to aid in the calculation of hydrocarbon recovery and determination of the effectiveness of the remediation technology. All vapor samples were collected in tedlar bags, entered onto a chain of custody document, sealed inside a shipping cooler on ice, and shipped overnight to TestAmerica, Inc. of Tampa, FL. The vapor samples were submitted for total volatile petroleum hydrocarbons (TVPH), BTEX, and MTBE analysis via EPA Method 18. Copies of the laboratory results and chain of custody documentation are included in Appendix D. In the interest of reducing paper waste, the QA/QC sections of the laboratory reports have not been included with this report. QA/QC documentation has been retained in-house and will be provided upon request. Table 10 included in Appendix A page 39 is a summary of the individual well vapor phase analytical results.

3.6.2.1 Individual Well Pilot Study Event – Monitoring Well MW21

On November 6, 2014, Greene initiated the individual phase of the 14-Day DPE Pilot Study Event. The DPE remediation system was connected to monitoring MW21 and extraction activities began at approximately 0930. However, due to an electrical control panel malfunction the system had to be shut down at approximately 1600 on November 6, 2014. The DPE remediation system ran approximately 6.5 hours with an average RCP vacuum of 23.5 inches of mercury (inHg) being applied to monitoring well MW21 and recovered an estimated 90 gallons of liquids. During the MW21 extraction event, Greene observed a measurable vacuum influence approximately 125 feet northeast and approximately 95 feet southwest of the extraction well. Due to the limited runtime, Greene did not perform a gauging event to determine the drawdown of the groundwater table in selected monitoring wells. Greene collected RCP vapor sample MW21-1 subsequent to the system running for approximately two hours. Analytical results of the MW21-1 vapor sample are provided in Table 10 included in Appendix A page 39. Due to the limited runtime while connected to monitoring well MW21, additional vapor samples were unable to be collected. Table 11 included in Appendix A page 40 is a summary of the pilot study event performed at monitoring well MW21. A copy of the individual well pilot study Radius of Influence Map for MW21 is included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW21, an estimated total of 449.51 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. It should be noted that the estimated recovery was based on only one sample collected approximately two hours following system start up. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW21 are provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor phase recovery estimates during pilot study activities performed at monitoring well MW21 are included in Appendix H.

3.6.2.2 Individual Well Pilot Study Event – Monitoring Well MW03

Due to the electrical control panel malfunction, the DPE remediation system was shut down from approximately 1600 on November 6, 2014 until November 13, 2014. Subsequent to replacing the faulty electrical equipment, Greene connected the DPE remediation system to monitoring well MW03 and extraction activities began at approximately 1015 on November 13, 2014. The DPE remediation system ran approximately 23.25 hours with an average RCP vacuum of 22.67 inHg being applied to monitoring well MW03 and recovered an estimated 2,180 gallons of liquids. During the MW03 extraction event, Greene observed a measurable vacuum influence approximately 85 feet northeast and approximately 100 feet southwest of the extraction well. In addition, Greene observed measurable drawdown of the groundwater table in the onsite monitoring wells. The maximum drawdown of 4.60 feet was observed within monitoring well

MW26 and a drawdown of 2.62 feet was observed at the extraction well (MW03). Monitoring well MW01A located approximately 45 feet northeast of MW03 yielded a drawdown of 0.71 feet. However, monitoring well MW25 located approximately 30 feet northwest of MW03 yielded a drawdown of 0.30 feet. The greater influence northeast of the extraction well likely confirms the foliations in the rock and the micaceous soils with relict structure are primarily controlling the migration groundwater at the subject site. In addition, Greene collected RCP vapor samples MW03-1, MW03-2, and MW03-3 subsequent to the system running for approximately one hour, seven hours, and 22 hours, respectively. Analytical results of the three vapor samples collected during system operation while connected to MW03 are provided in Table 10 included in Appendix A page 39. Table 12 included in Appendix A pages 41-42 is a summary of the pilot study event performed at monitoring well MW03. Copies of the individual well pilot study Radius of Influence Map and Drawdown Map for MW03 are included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW03, an estimated total of 334.29 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW03 are provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor phase recovery estimates during pilot study activities performed at monitoring well MW03 are included in Appendix H.

3.6.2.3 Individual Well Pilot Study Event – Monitoring Well MW28

On November 14, 2014, Greene connected the DPE remediation system to monitoring well MW28 and extraction activities began at approximately 0945. The DPE remediation system ran approximately 23.00 hours with an average RCP vacuum of 20.0 inHg being applied to monitoring well MW28 and recovered an estimated 1,125 gallons of liquids. During the MW28 extraction event, Greene observed a measurable vacuum influence approximately 145 feet northeast and approximately 35 feet southwest of the extraction well. In addition, Greene observed measurable drawdown of the groundwater table in the onsite monitoring wells. The maximum drawdown of 2.75 feet was observed at the extraction well MW28. Monitoring well MW02 located approximately 90 feet northeast of MW28 yielded a drawdown of 0.90 feet. However, monitoring well MW15 located approximately 25 feet southeast of MW28 yielded a drawdown of 0.63 feet. The greater influence northeast of the extraction well likely confirms the foliations in the rock and the micaceous soils with relict structure are primarily controlling the migration groundwater at the subject site. In addition, Greene collected RCP vapor samples MW28-1, MW28-2, and MW28-3 subsequent to the system running for approximately one hour, seven hours, and 22 hours, respectively. Analytical results of the three vapor samples collected during system operation while connected to MW28 are provided in Table 10 included in Appendix A page 39. Table

13 included in Appendix A pages 43-44 is a summary of the pilot study event performed at monitoring well MW28. Copies of the individual well pilot study Radius of Influence Map and Drawdown Map for MW28 are included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW28, an estimated total of 221.97 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW28 are provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor phase recovery estimates during pilot study activities performed at monitoring well MW28 are included in Appendix H.

3.6.2.4 Individual Well Pilot Study Event – Monitoring Well MW26

On November 15, 2014, Greene connected the DPE remediation system to monitoring well MW26 and extraction activities began at approximately 0845. The DPE remediation system ran approximately 24.50 hours with an average RCP vacuum of 20.0 inHg being applied to monitoring well MW26 and recovered an estimated 475 gallons of liquids. During the MW26 extraction event, Greene observed a measurable vacuum influence approximately 65 feet northeast and approximately 120 feet southwest of the extraction well. In addition, Greene observed measurable drawdown of the groundwater table in the onsite monitoring wells. The maximum drawdown of 2.05 feet was observed at the extraction well MW26. Monitoring well MW14 located approximately 38 feet southwest of MW26 yielded a drawdown of 0.77 feet. However, monitoring well MW04 located approximately 21 feet southeast of MW26 yielded a drawdown of 0.53 feet. The greater influence southwest of the extraction well likely confirms the foliations in the rock and the micaceous soils with relict structure are primarily controlling the migration groundwater at the subject site. In addition, Greene collected RCP vapor samples MW26-1, MW26-2, and MW26-3 subsequent to the system running for approximately one hour, seven hours, and 24 hours, respectively. Analytical results of the three vapor samples collected during system operation while connected to MW26 are provided in Table 10 included in Appendix A page 39. Table 14 included in Appendix A pages 45-46 is a summary of the pilot study event performed at monitoring well MW26. Copies of the individual well pilot study Radius of Influence Map and Drawdown Map for MW26 are included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW26, an estimated total of 160.92 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW26 are provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor

phase recovery estimates during pilot study activities performed at monitoring well MW26 are included in Appendix H.

3.6.2.5 Individual Well Pilot Study Event – Monitoring Well MW22

On November 16, 2014, Greene connected the DPE remediation system to monitoring well MW22 and extraction activities began at approximately 0920. The DPE remediation system ran approximately 24.00 hours with an average RCP vacuum of 19.89 inHg being applied to monitoring well MW22 and recovered an estimated 1,400 gallons of liquids. During the MW22 extraction event, Greene observed a measurable vacuum influence approximately 110 feet northeast and approximately 70 feet southwest of the extraction well. In addition, Greene observed measurable drawdown of the groundwater table in the onsite monitoring wells. The maximum drawdown of 3.78 feet was observed at the extraction well MW22. Monitoring well MW19 located approximately 70 feet southwest of MW22 yielded a drawdown of 1.15 feet. However, monitoring well MW14 located approximately 28 feet southeast of MW22 yielded a drawdown of 0.45 feet. The greater influence southwest of the extraction well likely confirms the foliations in the rock and the micaceous soils with relict structure are primarily controlling the migration groundwater at the subject site. In addition, Greene collected RCP vapor samples MW22-1, MW22-2, and MW22-3 subsequent to the system running for approximately one hour, seven hours, and 23.5 hours, respectively. Analytical results of the three vapor samples collected during system operation while connected to MW22 are provided in Table 10 included in Appendix A page 39. Table 15 included in Appendix A pages 47-48 is a summary of the pilot study event performed at monitoring well MW22. Copies of the individual well pilot study Radius of Influence Map and Drawdown Map for MW22 are included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW22, an estimated total of 229.49 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW22 are provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor phase recovery estimates during pilot study activities performed at monitoring well MW22 are included in Appendix H.

3.6.2.6 Individual Well Pilot Study Event – Monitoring Well MW02

On November 17, 2014, Greene connected the DPE remediation system to monitoring well MW02 and extraction activities began at approximately 0915. The DPE remediation system ran approximately 24.25 hours with an average RCP vacuum of 19.50 inHg being applied to monitoring well MW02 and recovered an estimated 1,250 gallons of liquids. During the MW02 extraction event, Greene observed a measurable vacuum

influence approximately 60 feet northeast and approximately 125 feet southwest of the extraction well. In addition, Greene observed measurable drawdown of the groundwater table in the onsite monitoring wells. The maximum drawdown of 3.25 feet was observed at the extraction well MW02. Monitoring wells MW14 and MW24 yielded similar drawdown values of 0.73 feet and 0.80 feet, respectively. However MW14 is located approximately 47 feet southwest of MW02 and MW24 located approximately 20 feet southeast of MW02, which likely indicates the groundwater table is primarily influenced by the foliations in the rock and the micaceous soils with relict structure. In addition, Greene collected RCP vapor samples MW02-1, MW02-2, and MW02-3 subsequent to the system running for approximately one hour, seven hours, and 24 hours, respectively. Analytical results of the three vapor samples collected during system operation while connected to MW02 are provided in Table 10 included in Appendix A page 39. Table 16 included in Appendix A pages 49-50 is a summary of the pilot study event performed at monitoring well MW02. Copies of the individual well pilot study Radius of Influence Map and Drawdown Map for MW02 are included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW02, an estimated total of 449.87 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW02 are provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor phase recovery estimates during pilot study activities performed at monitoring well MW02 are included in Appendix H.

3.6.2.7 Individual Well Pilot Study Event – Monitoring Well MW14

On November 18, 2014, Greene connected the DPE remediation system to monitoring well MW14 and extraction activities began at approximately 0945. The DPE remediation system ran approximately 23.50 hours with an average RCP vacuum of 19.78 inHg being applied to monitoring well MW14 and recovered an estimated 1,180 gallons of liquids. During the MW14 extraction event, Greene observed a measurable vacuum influence approximately 105 feet northeast and approximately 75 feet west of the extraction well. In addition, Greene observed measurable drawdown of the groundwater table in the onsite monitoring wells. The maximum drawdown of 2.89 feet was observed at the extraction well MW14. Monitoring well MW26 located approximately 38 feet northeast of MW14 yielded a drawdown of 1.55 feet. However, monitoring well MW22 located approximately 28 feet southeast of MW14 yielded a drawdown of 0.84 feet. The greater influence northeast of the extraction well likely confirms the foliations in the rock and the micaceous soils with relict structure are primarily controlling the migration groundwater at the subject site. In addition, Greene collected RCP vapor samples MW14-1, MW14-2, and MW14-3 subsequent to the system running for approximately one hour, seven hours, and 23.5 hours, respectively. Analytical results of the three vapor samples collected during

system operation while connected to MW14 are provided in Table 10 included in Appendix A page 39. Table 17 included in Appendix A pages 51-52 is a summary of the pilot study event performed at monitoring well MW14. Copies of the individual well pilot study Radius of Influence Map and Drawdown Map for MW14 are included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW14, an estimated total of 199.79 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW14 are provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor phase recovery estimates during pilot study activities performed at monitoring well MW14 are included in Appendix H.

3.6.2.8 Individual Well Pilot Study Event – Monitoring Well MW23

On November 19, 2014, Greene connected the DPE remediation system to monitoring well MW23 and extraction activities began at approximately 0930. The DPE remediation system ran approximately 24.00 hours with an average RCP vacuum of 20.22 inHg being applied to monitoring well MW23 and recovered an estimated 310 gallons of liquids. During the MW23 extraction event, Greene observed a measurable vacuum influence approximately 22 feet northeast and approximately 125 feet southwest of the extraction well. In addition, Greene observed measurable drawdown of the groundwater table in the onsite monitoring wells. The maximum drawdown of 3.64 feet was observed at the extraction well MW23. Monitoring well MW02 located approximately 35 feet southwest of MW23 yielded a drawdown of 0.93 feet. However, monitoring well MW12 located approximately 22 feet southeast of MW23 yielded a drawdown of 0.56 feet. The greater influence southwest of the extraction well likely confirms the foliations in the rock and the micaceous soils with relict structure are primarily controlling the migration groundwater at the subject site. In addition, Greene collected RCP vapor samples MW23-1, MW23-2, and MW23-3 subsequent to the system running for approximately one hour, seven hours, and 23.75 hours, respectively. Analytical results of the three vapor samples collected during system operation while connected to MW23 are provided in Table 10 included in Appendix A page 39. Table 18 included in Appendix A pages 53-54 is a summary of the pilot study event performed at monitoring well MW23. Copies of the individual well pilot study Radius of Influence Map and Drawdown Map for MW23 are included in Appendix B.

Based on data obtained during the individual well pilot study at monitoring well MW23, an estimated total of 142.07 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on TVPH. The vapor phase mass recovery estimates obtained during system operation at monitoring well MW23 are

provided in Table 19 included in Appendix A page 55. A calculation sheet utilized to calculate the vapor phase recovery estimates during pilot study activities performed at monitoring well MW23 are included in Appendix H.

3.6.2.9 Individual Well Pilot Study Event Summary

In order to collect well specific recovery data, the DPE remediation system was individually connected to monitoring wells MW21, MW03, MW28, MW26, MW22, MW02, MW14, and MW23 on November 6, November 13, November 14, November 15, November 16, November 17, November 18, and November 19, 2014, respectively. The DPE remediation system operated for a total of 173 hours during the individual well phase of the pilot study event and a total 8,010 gallons of free product and petroleum impacted groundwater were recovered, transported and disposed by EVO. Upon receipt of the EVO invoice for liquid disposal services following the completion of the DPE pilot study Greene discovered a discrepancy between the system totalizer readings and the disposal volume claimed by EVO. The EVO manifests account for a total discharge volume of 27,838 and Greene observed a totalizer volume of 36,402. This 24% variation is thought to be due to calibration issues following the replacement of the programmable logic controller (PLC) early during the pilot study. As such, the observed totalizer volumes have been adjusted downward by 24% in order to account for this discrepancy. Copies of the Non Hazardous Waste Manifests and Certificates of Disposal generated during the pilot study are included in Appendix F.

An estimated total of 2,187.91 pounds of hydrocarbon contamination was recovered in the vapor phase during the individual well phase of the 14-Day Pilot Study Event based on average TVPH concentration and a calculated vapor phase recovery volume. In addition, approximately 25-gallons of free phase petroleum were recovered during the individual phase of the pilot study. Throughout the entire individual well phase of the pilot study significant areas of influence and groundwater drawdown were observed likely indicating acceptable communication throughout the subsurface soils. It should be noted that groundwater drawdown and vacuum influence observations made during this portion of the pilot study indicate a significant communication preference along a northeast-southwest orientation. This preference and its orientation is thought to further confirm the expected influence of the relict soil structure on the groundwater flow and likely indicates a similar influence of air flow.

3.6.3 Multiple Well Pilot Study Event

On August 20, 2014, Greene initiated the multiple well phase of the 14-Day Pilot Study Event in order to collect data more representative of the anticipated long term remediation effort. Greene connected the DPE remediation system to monitoring wells MW02, MW03, MW22, and MW26 and began extraction activities at

approximately 1200. Subsequent to allowing the remediation system to come into equilibrium, Greene connected the DPE remediation system to monitoring wells MW24 and MW25 at approximately 1235. Based on the significant rate of groundwater recovery observed, Greene disconnected MW22 from the DPE remediation system at approximately 1510. Finally, Greene connected the DPE remediation system to MW01A and MW14 at approximately 1530. Subsequent to allowing the remediation system to come into equilibrium, Greene determined that monitoring wells MW01A, MW02, MW03, MW14, MW24, MW25, and MW26 would be utilized as extraction points during the multiple well phase of the pilot study event.

The DPE remediation system operated for a total of 145.5 hours during the multiple well phase of the pilot study event with an average RCP vacuum of 14.41 inHg being applied to monitoring wells MW01A, MW02, MW03, MW14, MW24, MW25, and MW26. A total of 19,828 gallons of free product and petroleum impacted groundwater were recovered, transported and disposed by EVO during the multiple well phase of the pilot study event. As discussed in Section 3.6.2.9, the observed totalizer volumes were adjusted downward by 24% in order to account for the discrepancy between the observed totalizer volumes and the disposal volume claimed by EVO. Copies of the Non Hazardous Waste Manifests and Certificates of Disposal generated during the pilot study are included in Appendix F.

Monitoring data obtained during the multiple well phase of the pilot study indicated a significant radius of influence and measurable cone of depression. An approximate radius of influence of 260 feet was observed throughout the entire multiple well pilot study event. The average drawdown observed throughout the entire multiple well pilot study event was approximately 1.99 feet, with a maximum drawdown of 3.74 feet being observed at MW02. Throughout the entire multiple well pilot study significant areas of influence and groundwater drawdown were observed likely indicating acceptable communication throughout the subsurface soils. As during the individual well phase of the pilot study, groundwater drawdown and vacuum influence observations made during the multiple well portion of the pilot study indicate a significant communication preference along a northeast-southwest orientation. This preference and its orientation is thought to further confirm the expected influence of the relict soil structure on the groundwater flow and likely indicates a similar influence of air flow. Tables 20, 21, and 22 included in Appendix A pages 56-58 are a summary of the multiple well pilot study data, a summary of the multiple well drawdown data, and a summary of the multiple well radius of influence data. Copies of the multiple well pilot study Radius of Influence Maps and Drawdown Maps are included in Appendix B.

In an effort to calculate hydrocarbon recovery estimates, Greene collected eight RCP vapor samples, eight air stripper vapor samples, eight influent water samples, and eight effluent water samples. The initial set of vapor

and water samples was collected approximately seven hours following start-up of the multiple well phase of the 14-Day Pilot Study Event. The second and third sets of vapor and water samples were collected subsequent to allowing the system to run for approximately 15 hours and 23 hours. The remaining vapor and water samples were collected once per day on November 22, November 23, November 24, November 25, and November 26, 2014. Analytical results of the 16 vapor samples and 16 water samples collected during system operation while connected to MW01A, MW02, MW03, MW14, MW24, MW25, and MW26 are provided in Tables 23 and 24, respectively, included in Appendix A pages 59-60.

Based on data obtained during the multiple well phase of the 14-Day Pilot Study Event, an estimated 25 gallons of free phase petroleum was recovered in the product recovery drum. In addition, an estimated total of 2,167.29 pounds of hydrocarbon contamination was recovered in the vapor phase as calculated based on average TVPH concentration and a calculated vapor phase recovery volume. Further, an estimated total of 19.38 pounds of hydrocarbon contamination was recovered in the dissolved phase as calculated based on average influent TPH-GRO concentration and the adjusted liquid phase recovery volume. Table 25 included in Appendix A page 61 is a summary of the hydrocarbon contamination recovery estimates during the multiple well phase of the pilot study event. Calculation sheets utilized to calculate the vapor phase and dissolved phase recovery estimates are included in Appendix H.

3.6.4 Dual-Phase Extraction Pilot Study Event Summary

As part of the IA CAP IMP activities, Greene performed a 14-day DPE Pilot Study Event at the Meadows of Dan Food Market facility. The pilot study was separated into two phases; an individual well pilot study event and a multiple well pilot study event. The individual well phase of the pilot study was performed in order to collect well specific recovery data, and the multiple well phase of the pilot study was performed in order to collect data more representative of the anticipated long term remediation effort. Greene utilized a mobile DPE remediation system to perform the pilot study event. The DPE remediation system operated for a total of 318.5 hours during the 14-Day Pilot Study Event and a total of 27,838 gallons of free product and groundwater were recovered, transported and disposed by EVO. As discussed in Section 3.6.2.9, the observed totalizer volumes were adjusted downward by 24% in order to account for the discrepancy between the observed totalizer volumes and the disposal volume claimed by EVO. Copies of the Non Hazardous Waste Manifests and Certificates of Disposal generated during the pilot study are included in Appendix F.

An estimated total of 4,355.20 pounds of hydrocarbon contamination was recovered in the vapor phase and an estimated total of 19.38 pounds of hydrocarbon contamination was recovered in the dissolved phase during the 14-Day Pilot Study Event. It should be noted that no dissolved phase analytical data was obtained during the

individual well phase of the pilot study. In addition, approximately 50-gallons of free phase petroleum were recovered during the event. In addition, air stripper efficiency has been calculated based on the laboratory results for influent and effluent sample sets. Water sample laboratory results were broken down by individual constituents and then average effluent results were compared to the average influent results in order to determine the percentage of each constituent was removed through air stripping. The maximum observed air stripper efficiency observed was for benzene at 99.47%, while the minimum efficiency observed was for MTBE at 95.47%. Air stripper efficiencies of 99.28%, 98.36%, 98.30%, and 96.08% were observed for toluene, ethylbenzene, xylenes, and TPH-GRO, respectively. A Calculation Sheet depicting this process for individual BTEX constituents, MTBE, and TPH-GRO is included in Appendix H. As previously discussed, throughout the entire multiple well pilot study groundwater drawdown and vacuum influence observations made during the multiple well portion of the pilot study indicate a significant communication preference along a northeast-southwest orientation. Based on the information obtained during this pilot study, DPE remediation technology appears to be the most cost effective means of long term corrective action for the Meadows of Dan Food Market facility. Dual-phase systems have proven to be effective in attaining remediation endpoints within one to four years. Capital costs associated with a fixed recovery and treatment system typically ranges from \$80,000 to \$200,000. Annual operation and maintenance costs typically range from \$25,000 to \$75,000.

4.0 Risk Assessment

Greene performed a risk assessment to evaluate the potential risk to human health and the environment associated with the petroleum compounds detected at the site. The findings of the risk assessment are presented in the following sections.

4.1 Identification of Receptors

During the initial SCR phase of work, Greene performed a ¼-mile radius receptor survey to identify potential receptors to the confirmed petroleum contamination located at the Meadows of Dan Food Market facility. A summary of the receptor survey activities is documented in the SCR dated April 18, 2014. To date, Greene has identified six residential properties, 12 commercial properties, and one church property within the search radius. In addition, a total of 14 drinking water wells, two springs, and one pond have been identified. Further, the nearest potential surface water receptor, an unnamed intermittent tributary to Tuggle Creek, is located approximately 950 feet to the east. An updated summary of the potential receptors is presented in Table 26 included in Appendix A pages 62-63. A Potential Receptors Location Map is included in Appendix B.

4.2 Identification of Exposure Pathways

The identification of potential exposure pathways is necessary to evaluate the risk posed by the extent of the release. An exposure pathway requires that there be some mechanism for any person or population to come into contact with one or more of the media which contain the contaminant of concern. No risk is assumed in the absence of contamination or in the absence of an exposure pathway.

4.2.1 Inhalation

The presence of asphalt, concrete, and gravel surface coverings in the immediate vicinity of the UST system mitigates concern associated with potential exposure to VOC vapors emanating from the subsurface.

4.2.2 Ingestion

The most likely pathway for the ingestion of petroleum contamination would be through consumption of contaminated groundwater within the area. As discussed in Section 4.4.3 of this report, CFU systems have been installed at each of the properties where petroleum impact to drinking water has been confirmed (DW02, DW03, DW12, and DW15). The installation, routine monitoring, and maintenance of the CFU systems by the VA DEQ AWS should mitigate concern associated with ingestion of petroleum impacted drinking water. In addition, groundwater samples collected from nearby drinking water wells and springs continue to yield Non Detected for all analytes at laboratory method detection limits. Topographic information indicates a pond draining to an intermittent tributary to Tuggle Creek is located approximately 1,130 feet southwest of the confirmed petroleum release. In addition, intermittent tributaries to Tuggle Creek are located approximately 950 feet east and 1,030 feet southwest of the confirmed petroleum release. However, surface water samples have not been collected from the pond or intermittent tributaries to confirm the presence or absence of dissolved phase petroleum impact. The presence of grass and asphalt surface coverings in the immediate vicinity of the observed contaminants mitigates concern associated with inadvertent ingestion of petroleum impacted soil.

4.2.3 Dermal Contact

The UST system is covered with asphalt, concrete, and gravel mitigating concern associated with potential contact with adsorbed phase contaminants. Carbon filtration units have been installed at receptor locations DW02, DW03, DW12, and DW15 mitigating concern associated with potential contact with dissolved phase contaminants. However, surface water samples have not been collected from the pond or intermittent tributaries to confirm the presence or absence of dissolved phase petroleum impact.

5.0 Conclusions and Recommendations

Based on the significant free phase and dissolved phase petroleum plumes and the confirmed petroleum impact to drinking water wells in the area, Greene was approved to perform IA CAP IMP activities at the Meadows of Dan Food Market facility. In an effort to complete characterization of the free phase plume, Greene installed nine additional soil borings/monitoring wells during this phase of investigation. Free phase plume mapping generated during IA CAP IMP activities, likely indicates the free phase plume has been fully delineated to the extents practical based on current site conditions. Further, the free phase plume mapping indicates a free product plume extending northeast-southwest approximately 200 feet, and measurable free product thicknesses have been observed within 15 (MW01A, MW02, MW03, MW07, MW12, MW14, MW15, MW19, MW21, MW22, MW23, MW24, MW25, MW26, and MW28) of the 28 monitoring wells. In an effort to reduce the observed free phase petroleum, Greene performed multiple recovery events during this phase of investigation. Specifically, Greene performed six vacuum truck recovery events and a 14-Day DPE Pilot Study Event at the property and approximately 29,175 gallons of free product and highly concentrated dissolved phase petroleum contamination were recovered.

Groundwater samples collected from the 28 monitoring wells confirmed the presence of onsite and offsite dissolved phase petroleum contamination in the shallow groundwater. Based on the free phase petroleum plume maps and the Isoconcentration maps generated during this phase of investigation, free product movement appears to be primarily to the southwest, which is contrary to the observed hydraulic gradient to the southeast. It is likely groundwater flow is also affected by the same anisotropic condition, and if so groundwater flow would be primarily to the southwest. Analytical results of drinking water samples collected from receptor IDs DW01, DW07/DW08, DW13, DW14, DW16, MW17, and DW19 yielded Non Detected for all analytes at laboratory method detection limits. However, pre-filtration drinking water samples continue to yield the presence of petroleum contamination at receptor IDs MW02, MW03, MW12, and MW15. Surface water samples were not collected during this phase of investigation; however, based on the limited fate and transport modeling performed during the previous phase of investigation there remains potential for surface water impact from the observed petroleum contamination.

As part of IA CAP IMP activities, Greene prepared the site for long term utilization of remediation technology to address the observed petroleum contamination observed both onsite and offsite. Subsequent to completing the trenching and subsurface pipe installation, Greene then performed a 14-day DPE Pilot Study Event at the Meadows of Dan Food Market facility. The pilot study was separated into two phases; an eight day individual well pilot study event and a six day multiple well pilot study event. The individual well phase of the pilot study was performed in order to collect well specific recovery data, and the multiple well phase of the pilot

study was performed in order to collect data more representative of the anticipated long term remediation effort. The DPE remediation system operated for a total of 318.5 hours during the 14-Day Pilot Study Event and recovered a total of 27,838 gallons of free product and groundwater and 3,872,730 cubic feet (ft³) of RCP exhaust vapor. In addition, an estimated total of 4,355.20 pounds of hydrocarbon contamination was recovered in the vapor phase and an estimated total of 19.38 pounds of hydrocarbon contamination was recovered in the dissolved phase during the 14-Day Pilot Study Event. Approximately 50-gallons of free phase petroleum were recovered during the event. Throughout the entire pilot study significant areas of influence and groundwater drawdown were observed indicating acceptable communication throughout the subsurface soils. Based on the information obtained during this pilot study, DPE remediation technology appears to be the most cost effective means of long term corrective action for the Meadows of Dan Food Market facility. However, details concerning the remediation feasibility and remedial endpoints will be discussed in much greater detail during the CAP Development Phase.

As a result of completing IA CAP IMP activities, Greene recommends initiating CAP Development. As part of CAP Development, Greene will obtain any federal, state, or local permits required to implement the CAP. In addition, Greene will perform a free product transmissivity investigation at the subject site. However, prior to initiating the transmissivity study, Greene recommends allowing subsurface conditions to equilibrate to increase the accuracy of the investigation. Subsequent to completing the transmissivity study, Greene also recommends resuming monthly vacuum truck free product recovery events at the Meadows of Dan Food Market facility. Further, Greene recommends the collection of surface water samples and additional drinking water sampling be performed. Greene recommends collecting surface water samples from the pond and two intermittent tributaries to Tuggle Creek to confirm the presence or absence of petroleum impact. Finally, Greene recommends obtaining a drinking water sample from the shared supply well providing potable water to receptor IDs DW04, DW05, and DW06 once access has been granted. In addition, Greene recommends the continued sampling of onsite drinking water well (DW01) and the drinking water at receptor IDs DW07/DW08, DW13, DW14, DW16, DW17, and DW19.

End of the Interim Authorization Corrective Action Plan Implementation

APPENDIX A**Tables**

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Table 1.
A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW01 ³	02/27/14	2,962.67	31.54	2,931.13
	03/06/14		31.48	2,931.19
	03/10/14		31.50	2,931.17
	03/12/14		31.21	2,931.46
	03/14/14		31.44	2,931.23
	03/19/14		32.98	2,929.69
	03/28/14		31.33	2,931.34
	04/07/14		31.12	2,931.55
	04/16/14		31.19	2,931.48
	04/25/14		30.68	2,931.99
	05/02/14		30.64	2,932.03
MW01A	05/07/14	2,967.05	30.89	2,936.16
	05/14/14		30.95	2,936.10
	05/23/14		30.99	2,936.06
	06/06/14		31.41	2,935.64
	06/13/14		31.61	2,935.44
	06/18/14		31.78	2,935.27
	06/25/14		31.90	2,935.15
	07/01/14		31.99	2,935.06
	07/10/14		32.14	2,934.91
	07/16/14		32.14	2,934.91
	07/24/14		32.21	2,934.84
	07/30/14		32.34	2,934.71
	08/05/14		32.26	2,934.79
	08/19/14		31.78	2,935.27
	09/25/14	2,966.19	30.69	2,935.50
10/16/14	31.41		2,934.78	
11/05/14	31.41		2,934.78	
MW02	02/27/14	2,967.02	31.80	2,935.22
	03/06/14		31.80	2,935.22
	03/10/14		31.67	2,935.35
	03/12/14		31.53	2,935.49
	03/14/14		31.74	2,935.28
	03/19/14		31.74	2,935.28

Table 1 (Cont'd).
A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW02 (Cont'd)	03/28/14	2,967.02	31.57	2,935.45
	04/07/14		31.42	2,935.60
	04/16/14		31.52	2,935.50
	04/25/14		31.01	2,936.01
	05/02/14		31.01	2,936.01
	05/07/14		31.07	2,935.95
	05/14/14		31.12	2,935.90
	05/23/14		31.17	2,935.85
	06/06/14		31.60	2,935.42
	06/13/14		31.74	2,935.28
	06/18/14		31.89	2,935.13
	06/25/14		31.97	2,935.05
	07/01/14		32.08	2,934.94
	07/10/14		32.25	2,934.77
	07/16/14		32.29	2,934.73
	07/24/14		32.32	2,934.70
	07/30/14		32.42	2,934.60
	08/05/14	32.45	2,934.57	
	08/19/14	31.97	2,935.05	
	09/24/14	2,966.24	30.93	2,935.31
10/16/14	31.48		2,934.76	
11/05/14	31.65		2,934.59	
MW03	02/27/14	2,966.80	32.61	2,934.19
	03/06/14		32.57	2,934.23
	03/10/14		32.45	2,934.35
	03/12/14		32.33	2,934.47
	03/14/14		32.50	2,934.30
	03/19/14		32.34	2,934.46
	03/28/14		32.32	2,934.48
	04/07/14		32.18	2,934.62
	04/16/14		32.32	2,934.48
	04/25/14		31.93	2,934.87
	05/02/14		31.91	2,934.89
	05/07/14		31.95	2,934.85
	05/14/14		31.96	2,934.84

Table 1 (Cont'd).

A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW03 (Cont'd)	05/23/14	2,966.80	31.99	2,934.81
	06/06/14		32.31	2,934.49
	06/13/14		32.51	2,934.29
	06/18/14		32.64	2,934.16
	06/25/14		32.76	2,934.04
	07/01/14		32.81	2,933.99
	07/10/14		32.95	2,933.85
	07/16/14		33.00	2,933.80
	07/24/14		32.99	2,933.81
	07/30/14		33.91	2,932.89
	08/05/14		33.17	2,933.63
	08/19/14		32.78	2,934.02
	09/24/14	2,966.05	31.74	2,934.31
	10/16/14		32.78	2,933.27
	11/05/14		32.29	2,933.76
MW04	02/27/14	2,965.67	31.85	2,933.82
	03/06/14		31.75	2,933.92
	03/10/14		31.43	2,934.24
	03/12/14		31.50	2,934.17
	03/14/14		31.64	2,934.03
	03/19/14		NA ⁴	NA
	03/28/14		31.46	2,934.21
	04/07/14		31.33	2,934.34
	04/16/14		31.44	2,934.23
	04/25/14		31.10	2,934.57
	05/02/14		31.03	2,934.64
	05/07/14		31.08	2,934.59
	05/14/14		31.08	2,934.59
	05/23/14		31.16	2,934.51
	06/06/14		31.48	2,934.19
	06/13/14		31.68	2,933.99
	06/18/14		31.82	2,933.85
	06/25/14		31.89	2,933.78
	07/01/14		32.03	2,933.64
07/10/14	32.10	2,933.57		

Table 1 (Cont'd).

A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW04 (Cont'd)	07/16/14	2,965.67	32.10	2,933.57
	07/24/14		32.01	2,933.66
	07/30/14		32.32	2,933.35
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		NA	NA
	11/05/14		32.46	2,933.21
MW05	02/27/14	2,965.57	31.69	2,933.88
	03/06/14		31.57	2,934.00
	03/10/14		31.63	2,933.94
	03/12/14		31.31	2,934.26
	03/14/14		31.47	2,934.10
	03/19/14		NA	NA
	03/28/14		31.28	2,934.29
	04/07/14		31.16	2,934.41
	04/16/14		31.24	2,934.33
	04/25/14		30.89	2,934.68
	05/02/14		30.83	2,934.74
	05/07/14		30.87	2,934.70
	05/14/14		30.88	2,934.69
	05/23/14		30.97	2,934.60
	06/06/14		31.31	2,934.26
	06/13/14		31.53	2,934.04
	06/18/14		31.67	2,933.90
	06/25/14		31.84	2,933.73
	07/01/14		31.87	2,933.70
	07/10/14		31.86	2,933.71
	07/16/14		32.04	2,933.53
	07/24/14		32.06	2,933.51
	07/30/14		32.18	2,933.39
	08/05/14		NA	NA
08/19/14	NA	NA		
09/24/14	NA	NA		

Table 1 (Cont'd).
A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW05 (Cont'd)	10/16/14	2,965.57	NA	NA
	11/05/14		32.34	2,933.23
MW06	02/27/14	2,967.63	30.88	2,936.75
	03/06/14		30.75	2,936.88
	03/10/14		30.62	2,937.01
	03/12/14		30.47	2,937.16
	03/14/14		30.67	2,936.96
	03/19/14		NA	NA
	03/28/14		30.52	2,937.11
	04/07/14		30.41	2,937.22
	04/16/14		30.49	2,937.14
	04/25/14		29.98	2,937.65
	05/02/14		29.94	2,937.69
	05/07/14		29.97	2,937.66
	05/14/14		30.02	2,937.61
	05/23/14		30.13	2,937.50
	06/06/14		30.51	2,937.12
	06/13/14		30.73	2,936.90
	06/18/14		30.92	2,936.71
	06/25/14		31.06	2,936.57
	07/01/14		31.19	2,936.44
	07/10/14		31.27	2,936.36
	07/16/14		31.38	2,936.25
	07/24/14		31.37	2,936.26
	07/30/14		31.43	2,936.20
08/05/14	NA	NA		
08/19/14	NA	NA		
09/24/14	NA	NA		
10/16/14	31.09	2,936.54		
11/05/14	31.16	2,936.47		
MW07	05/07/14	2,966.80	30.99	2,935.81
	05/14/14		31.01	2,935.79
	05/23/14		31.09	2,935.71
	06/06/14		31.47	2,935.33
	06/13/14		31.66	2,935.14

Table 1 (Cont'd).

A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW07 (Cont'd)	06/18/14	2,966.80	31.83	2,934.97
	06/25/14		32.10	2,934.70
	07/01/14		32.03	2,934.77
	07/10/14		32.05	2,934.75
	07/16/14		32.08	2,934.72
	07/24/14		32.28	2,934.52
	07/30/14		32.41	2,934.39
	08/05/14		32.40	2,934.40
	08/19/14	31.94	2,934.86	
	09/25/14	2,966.00	30.81	2,935.19
	10/16/14		31.38	2,934.62
	11/05/14		31.57	2,934.43
MW08	05/07/14	2,966.74	32.45	2,934.29
	05/14/14		32.51	2,934.23
	05/23/14		32.60	2,934.14
	06/06/14		32.90	2,933.84
	06/13/14		33.27	2,933.47
	06/18/14		32.47	2,934.27
	06/25/14		33.52	2,933.22
	07/01/14		33.59	2,933.15
	07/10/14		33.64	2,933.10
	07/16/14		33.70	2,933.04
	07/24/14		33.84	2,932.90
	07/30/14		33.95	2,932.79
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
10/16/14	NA	NA		
11/05/14	34.20	2,932.54		
MW09	05/07/14	2,967.40	33.10	2,934.30
	05/14/14		33.14	2,934.26
	05/23/14		33.22	2,934.18
	06/06/14		33.57	2,933.83
	06/13/14		33.76	2,933.64

Table 1 (Cont'd).

A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW09 (Cont'd)	06/18/14	2,967.40	33.21	2,934.19
	06/25/14		32.59	2,934.81
	07/01/14		34.09	2,933.31
	07/10/14		34.12	2,933.28
	07/16/14		34.11	2,933.29
	07/24/14		34.10	2,933.30
	07/30/14		34.43	2,932.97
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		NA	NA
	11/05/14		34.60	2,932.80
MW10	05/07/14	2,966.76	33.11	2,933.65
	05/14/14		33.42	2,933.34
	05/23/14		33.48	2,933.28
	06/06/14		33.83	2,932.93
	06/13/14		34.11	2,932.65
	06/18/14		33.72	2,933.04
	06/25/14		33.21	2,933.55
	07/01/14		34.39	2,932.37
	07/10/14		34.38	2,932.38
	07/16/14		34.41	2,932.35
	07/24/14		34.39	2,932.37
	07/30/14		35.03	2,931.73
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		NA	NA
11/05/14	35.10	2,931.66		
MW11	05/07/14	2,968.11	33.80	2,934.31
	05/14/14		33.83	2,934.28
	05/23/14		33.89	2,934.22
	06/06/14		34.09	2,934.02
	06/13/14		34.39	2,933.72

Table 1 (Cont'd).

A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW11 (Cont'd)	06/18/14	2,968.11	33.95	2,934.16
	06/25/14		33.03	2,935.08
	07/01/14		34.76	2,933.35
	07/10/14		34.80	2,933.31
	07/16/14		34.76	2,933.35
	07/24/14		34.92	2,933.19
	07/30/14		35.20	2,932.91
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		NA	NA
	11/05/14		35.20	2,932.91
MW12	05/07/14	2,966.76	30.80	2,935.96
	05/14/14		30.86	2,935.90
	05/23/14		31.01	2,935.75
	06/06/14		31.48	2,935.28
	06/13/14		31.75	2,935.01
	06/18/14		31.93	2,934.83
	06/25/14		32.05	2,934.71
	07/01/14		32.17	2,934.59
	07/10/14		32.34	2,934.42
	07/16/14		32.31	2,934.45
	07/24/14		32.43	2,934.33
	07/30/14		32.54	2,934.22
	08/05/14		32.57	2,934.19
	08/19/14		32.03	2,934.73
	09/24/14	2,965.94	30.90	2,935.04
	10/16/14		31.70	2,934.24
11/05/14	31.86		2,934.08	
MW13	05/07/14	2,965.32	30.43	2,934.89
	05/14/14		30.49	2,934.83
	05/23/14		30.61	2,934.71
	06/06/14		31.06	2,934.26
	06/13/14		31.33	2,933.99

Table 1 (Cont'd).
A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW13 (Cont'd)	06/18/14	2,965.32	31.44	2,933.88
	06/25/14		31.58	2,933.74
	07/01/14		31.64	2,933.68
	07/10/14		31.72	2,933.60
	07/16/14		31.74	2,933.58
	07/24/14		31.87	2,933.45
	07/30/14		32.03	2,933.29
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		NA	NA
	11/05/14		32.22	2,933.10
MW14	05/07/14	2,966.88	32.13	2,934.75
	05/14/14		32.20	2,934.68
	05/23/14		32.21	2,934.67
	06/06/14		32.47	2,934.41
	06/13/14		32.70	2,934.18
	06/18/14		32.85	2,934.03
	06/25/14		32.92	2,933.96
	07/01/14		33.02	2,933.86
	07/10/14		33.04	2,933.84
	07/16/14		33.17	2,933.71
	07/24/14		33.21	2,933.67
	07/30/14		33.31	2,933.57
	08/05/14		33.33	2,933.55
	08/19/14		32.98	2,933.90
	09/24/14	2,966.11	31.91	2,934.20
	10/16/14		32.66	2,933.45
	11/05/14		32.68	2,933.43
MW15	05/07/14	2,967.82	33.01	2,934.81
	05/14/14		33.05	2,934.77
	05/23/14		33.09	2,934.73
	06/06/14		33.37	2,934.45
	06/13/14		33.55	2,934.27

Table 1 (Cont'd).

A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW15 (Cont'd)	06/18/14	2,967.82	33.69	2,934.13
	06/25/14		33.81	2,934.01
	07/01/14		33.87	2,933.95
	07/10/14		34.00	2,933.82
	07/16/14		34.21	2,933.61
	07/24/14		34.07	2,933.75
	07/30/14		34.19	2,933.63
	08/05/14		34.20	2,933.62
	08/19/14	33.86	2,933.96	
	09/24/14	2,967.06	32.78	2,934.28
	10/16/14		33.35	2,933.71
	11/05/14		33.52	2,933.54
MW16	05/07/14	2,965.29	31.39	2,933.90
	05/14/14		31.58	2,933.71
	05/23/14		31.68	2,933.61
	06/06/14		31.88	2,933.41
	06/13/14		32.59	2,932.70
	06/18/14		32.61	2,932.68
	06/25/14		32.82	2,932.47
	07/01/14		32.85	2,932.44
	07/10/14		32.88	2,932.41
	07/16/14		32.79	2,932.50
	07/24/14		33.16	2,932.13
	07/30/14		33.33	2,931.96
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		NA	NA
11/05/14	33.75	2,931.54		
MW17	05/07/14	2,958.98	27.98	2,931.00
	05/14/14		28.35	2,930.63
	05/23/14		28.66	2,930.32
	06/06/14		28.79	2,930.19
	06/13/14		30.05	2,928.93

Table 1 (Cont'd).

A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW17 (Cont'd)	06/18/14	2,958.98	29.75	2,929.23
	06/25/14		29.51	2,929.47
	07/01/14		30.01	2,928.97
	07/10/14		30.00	2,928.98
	07/16/14		29.95	2,929.03
	07/24/14		29.39	2,929.59
	07/30/14		30.11	2,928.87
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		NA	NA
	11/05/14		32.12	2,926.86
MW18	05/07/14	2,969.25	33.31	2,935.94
	05/14/14		33.34	2,935.91
	05/23/14		33.38	2,935.87
	06/06/14		33.73	2,935.52
	06/13/14		33.85	2,935.40
	06/18/14		33.59	2,935.66
	06/25/14		33.79	2,935.46
	07/01/14		34.11	2,935.14
	07/10/14		34.16	2,935.09
	07/16/14		34.10	2,935.15
	07/24/14		34.27	2,934.98
	07/30/14		34.35	2,934.90
	08/05/14		NA	NA
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		34.23	2,935.02
11/05/14	34.43	2,934.82		
MW19	05/07/14	2,968.77	33.12	2,935.65
	05/14/14		33.14	2,935.63
	05/23/14		33.17	2,935.60
	06/06/14		33.48	2,935.29
	06/13/14		33.63	2,935.14

Table 1 (Cont'd).
A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW19 (Cont'd)	06/18/14	2,968.77	33.70	2,935.07
	06/25/14		33.91	2,934.86
	07/01/14		33.95	2,934.82
	07/10/14		34.10	2,934.67
	07/16/14		34.09	2,934.68
	07/24/14		34.17	2,934.60
	07/30/14		34.26	2,934.51
	08/05/14	34.30	2,934.47	
	08/19/14	33.90	2,934.87	
	09/24/14	2,968.05	32.65	2,935.40
	10/16/14		33.39	2,934.66
11/05/14	33.57		2,934.48	
MW20	08/05/14	2,968.47	35.45	2,933.02
	08/19/14		NA	NA
	09/24/14		NA	NA
	10/16/14		35.41	2,933.06
	11/05/14		35.66	2,932.81
MW21	08/05/14	2,967.61	34.73	2,932.88
	08/19/14		34.35	2,933.26
	09/24/14		33.14	2,934.47
	10/16/14		33.93	2,933.68
	11/05/14		33.54	2,934.07
MW22	08/05/14	2,966.98	32.69	2,934.29
	08/19/14		32.34	2,934.64
	09/24/14		31.11	2,935.87
	10/16/14		31.89	2,935.09
	11/05/14		32.16	2,934.82
MW23	08/05/14	2,966.33	31.99	2,934.34
	08/19/14		31.46	2,934.87
	09/24/14		30.43	2,935.90
	10/16/14		31.04	2,935.29
	11/05/14		31.16	2,935.17

Table 1 (Cont'd).
A Summary of Historic and Current Groundwater Elevation Data

Location	Date	Relative Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Relative Groundwater Elevation (feet)
MW24	08/05/14	2,965.79	32.90	2,932.89
	08/19/14		32.49	2,933.30
	09/24/14		31.61	2,934.18
	10/16/14		32.10	2,933.69
	11/05/14		32.38	2,933.41
MW25	08/05/14	2,966.88	NA	NA
	08/19/14		NA	NA
	09/24/14		30.84	2,936.04
	10/16/14		31.50	2,935.38
	11/05/14		31.39	2,935.49
MW26	08/05/14	2,965.54	32.78	2,932.76
	08/19/14		32.41	2,933.13
	09/24/14		31.21	2,934.33
	10/16/14		31.73	2,933.81
	11/05/14		31.94	2,933.60
MW27	08/05/14	2,966.28	31.35	2,934.93
	08/19/14		NA	NA
	09/24/14		29.81	2,936.47
	10/16/14		30.34	2,935.94
	11/05/14		30.47	2,935.81
MW28	08/05/14	2,967.54	NA	NA
	08/19/14		33.00	2,934.54
	09/24/14		32.03	2,935.51
	10/16/14		32.57	2,934.97
	11/05/14		32.73	2,934.81

¹Elevations measured by Fork Mountain Surveying and Mapping, Inc. relative to an approximate site elevation of 2,968 feet.

²If free phase petroleum was observed, depth to groundwater was calculated using a site specific gasoline density of 0.7439 g/ml.

³Elevations measured by Greene prior to permanently abandoning MW01.

⁴NA = Not Applicable.

Table 2.
A Summary of the Field Screening Results

Sample Identification	Depth (feet bgs)	Olfactory Observation	PID Readings (ppm)	Retained for Analysis
B20-1	0-5	No petroleum odor	0.0	No
B20-2	5-10	No petroleum odor	0.0	No
B20-3	10-15	No petroleum odor	0.0	No
B20-4	15-20	No petroleum odor	0.0	Yes
B20-5	20-25	No petroleum odor	0.1	Yes
B20-6	25-30	No petroleum odor	0.0	Yes
B20-7	30-35	Slight petroleum odor	1.9	Yes
B21-1	0-5	No petroleum odor	8.2	No
B21-2	5-10	Slight petroleum odor	0.5	No
B21-3	10-15	Slight petroleum odor	0.0	No
B21-4	15-20	Slight petroleum odor	0.5	Yes
B21-5	20-25	Slight petroleum odor	38.9	Yes
B21-6	25-30	Petroleum odor	68.2	Yes
B21-7	30-35	Strong petroleum odor	4,672	Yes
B22-1	0-5	No petroleum odor	0.0	Yes
B22-2	5-10	Slight petroleum odor	0.1	Yes
B22-3	10-15	Slight petroleum odor	2.5	Yes
B22-4	15-20	Slight petroleum odor	9.2	Yes
B22-5	20-25	Slight petroleum odor	22.7	Yes
B22-6	25-26	Slight petroleum odor	4.2	Yes
B22-7	26-30	Strong petroleum odor	105.9	Yes
B23-1	0-5	No petroleum odor	1.9	No
B23-2	5-10	Slight petroleum odor	3.6	No
B23-3	10-15	Slight petroleum odor	14.7	No
B23-4	15-20	Slight petroleum odor	92.4	Yes
B23-5	20-25	Slight petroleum odor	120.9	Yes
B23-6	25-29	Strong petroleum odor	2,739	Yes
B24-1	0-5	No petroleum odor	0.0	No
B24-2	5-10	No petroleum odor	0.0	No
B24-3	10-15	Slight petroleum odor	0.0	No

Table 2 (Cont'd).
A Summary of the Field Screening Results

Sample Identification	Depth (feet bgs)	Olfactory Observation	PID Readings (ppm)	Retained for Analysis
B24-4	15-20	Slight petroleum odor	9.8	Yes
B24-5	20-25	Slight petroleum odor	8.2	Yes
B24-6	25-30	Slight petroleum odor	2.7	Yes
B24-7	30-32	No sample collected	NA ¹	NA
B24-8	32-35	Slight petroleum odor	0.1	No
B25-1	0-5	No petroleum odor	0.6	Yes
B25-2	5-10	Slight petroleum odor	7.0	Yes
B25-3	10-15	Slight petroleum odor	25.6	Yes
B25-4	15-20	Slight petroleum odor	39.0	Yes
B25-5	20-25	Petroleum odor	57.3	Yes
B25-6	25-30	Strong petroleum odor	757.7	Yes
B25-7	30-32	Petroleum odor	153.3	Yes
B25-8	32-35	Petroleum odor	133.0	Yes
B26-1	0-5	No petroleum odor	0.0	No
B26-2	5-10	No petroleum odor	1.5	No
B26-3	10-15	Slight petroleum odor	5.5	No
B26-4	15-20	Slight petroleum odor	23.1	Yes
B26-5	20-25	Slight petroleum odor	27.8	Yes
B26-6	25-28	Strong petroleum odor	218.1	Yes
B26-7	28-30	Strong petroleum odor	115.2	Yes
B26-8	30-35	Strong petroleum odor	5,939	Yes
B27-1	0-5	No petroleum odor	0.0	No
B27-2	5-10	No petroleum odor	0.0	No
B27-3	10-15	No petroleum odor	0.0	No
B27-4	15-20	No petroleum odor	0.6	Yes
B27-5	20-25	Slight petroleum odor	0.0	Yes
B27-6	25-27	Slight petroleum odor	0.1	Yes
B27-7	27-30	Slight petroleum odor	0.3	Yes
B27-8	30-35	Slight petroleum odor	0.5	No

Table 2 (Cont'd).
A Summary of the Field Screening Results

Sample Identification	Depth (feet bgs)	Olfactory Observation	PID Readings (ppm)	Retained for Analysis
B28-1	0-5	No petroleum odor	0.0	No
B28-2	5-10	No petroleum odor	0.0	No
B28-3	10-15	No petroleum odor	0.0	No
B28-4	15-20	Slight petroleum odor	0.1	Yes
B28-5	20-24	Slight petroleum odor	1.1	Yes
B28-6	24-30	Slight petroleum odor	0.7	Yes
B28-7	30-35	Strong petroleum odor	7,137	Yes

¹NA = Not Applicable.

Table 3.
A Summary of the Residual Phase Analytical Results

Sample Identification	Date	Sample Depth (feet)	TPH-GRO ¹	TPH-DRO ²	Benzene ³	Toluene	Ethyl-benzene	Xylenes	MTBE	Naphthalene
B20-4	07/31/14	15-20	ND	ND	ND	ND	ND	ND	ND	ND
B20-5	07/31/14	20-25	ND	ND	ND	ND	ND	ND	ND	ND
B20-6	07/31/14	25-30	ND	ND	ND	ND	ND	ND	ND	ND
B20-7	07/31/14	30-35	ND	ND	ND	ND	ND	ND	ND	ND
B21-4	07/31/14	15-20	ND	ND	ND	ND	ND	ND	ND	ND
B21-5	07/31/14	20-25	ND	ND	ND	0.00186	ND	ND	ND	ND
B21-6	07/31/14	25-30	ND	ND	ND	0.0086	0.000924	0.00613	ND	0.00778
B21-7	07/31/14	30-35	1,420	38.4	3.45	79.7	38.1	202	ND	11.9
B22-1	07/31/14	0-5	ND	6.97	ND	ND	ND	ND	ND	ND
B22-2	07/31/14	5-10	ND	ND	ND	ND	ND	ND	ND	ND
B22-3	07/31/14	10-15	ND	ND	ND	ND	ND	ND	ND	ND
B22-4	07/31/14	15-20	ND	ND	ND	ND	ND	ND	0.0188	ND
B22-5	07/31/14	20-25	ND	ND	ND	0.0014	ND	ND	0.0265	ND
B22-6	07/31/14	25-26	ND	ND	ND	0.00134	ND	ND	0.027	ND
B22-7	07/31/14	26-30	ND	ND	ND	0.00261	ND	ND	ND	0.049
B23-4	07/31/14	15-20	0.294	ND	ND	0.000975	ND	ND	0.637	ND
B23-5	07/31/14	20-25	1.68	ND	0.0185	0.127	0.0146	0.104	1.16	ND
B23-6	07/31/14	25-29	677	86.1	ND	32.4	21.8	112	ND	9.52
B24-4	08/01/14	15-20	ND	ND	ND	ND	ND	ND	ND	ND
B24-5	08/01/14	20-25	ND	ND	ND	0.00221	ND	ND	0.0174	ND
B24-6	08/01/14	25-30	ND	ND	ND	0.00298	ND	ND	0.0124	ND
B25-1	08/04/14	0-5	ND	ND	0.00168	0.00128	ND	0.00456	0.0967	ND
B25-2	08/04/14	5-10	0.531	ND	0.0026	0.0086	ND	0.00698	0.664	ND
B25-3	08/04/14	10-15	ND	ND	0.0153	0.00833	ND	0.00468	2.23	ND

Table 3 (Cont'd).
A Summary of the Residual Phase Analytical Results

Sample Identification	Date	Sample Depth (feet)	TPH-GRO ¹	TPH-DRO ²	Benzene ³	Toluene	Ethyl-benzene	Xylenes	MTBE	Naphthalene
B25-4	08/04/14	15-20	ND	13.6	ND	0.0119	0.00135	0.00823	2.1	ND
B25-5	08/04/14	20-25	ND	ND	0.0111	0.0404	0.00578	0.0508	3.25	ND
B25-6	08/04/14	25-30	4,760	63.9	12.8	237	121	565	12	29.6
B25-7	08/04/14	30-32	3.67	ND	0.0543	0.559	0.1	0.619	1.27	0.0126
B25-8	08/04/14	32-35	0.77	ND	0.00361	0.0304	0.00766	0.0558	0.739	0.00467
B26-4	08/04/14	15-20	0.385	ND	0.00429	0.0248	0.00286	0.0186	0.555	ND
B26-5	08/04/14	20-25	0.497	ND	0.00327	0.0224	0.00257	0.0229	0.672	0.00624
B26-6	08/04/14	25-28	430	6.42	1.28	28.5	12.8	73.3	ND	5.03
B26-7	08/04/14	28-30	2.36	ND	0.00111	0.00857	0.0147	0.137	0.016	0.364
B26-8	08/04/14	30-35	354	23.3	ND	2.93	6.81	49.5	ND	13.3
B27-4	08/04/14	15-20	ND	ND	ND	0.00278	0.000942	0.00595	ND	ND
B27-5	08/04/14	20-25	ND	5.35	ND	ND	ND	ND	ND	ND
B27-6	08/04/14	25-27	ND	5.58	ND	ND	ND	ND	ND	ND
B27-7	08/04/14	27-30	ND	ND	ND	ND	ND	ND	ND	ND
B27-8	08/04/14	30-35	ND	ND	ND	ND	ND	ND	ND	ND
B28-4	08/04/14	15-20	ND	ND	ND	ND	ND	ND	ND	ND
B28-5	08/04/14	20-24	ND	ND	ND	ND	ND	ND	ND	ND
B28-6	08/04/14	24-30	ND	ND	ND	ND	ND	0.0032	ND	ND
B28-7	08/04/14	30-35	1,860	129	1.26	73.9	54.8	289	ND	25.6

¹TPH (gasoline range organics) analysis via U.S. EPA SW-846 method 8015B; reported in milligrams per kilogram (mg/kg).

²TPH (diesel range organics) analysis via U.S. EPA SW-846 method 8015B; reported in mg/kg.

³BTEX, MTBE, naphthalene analysis via U.S. EPA SW-846 method 8021B; reported in mg/kg.

⁴ND = Non detected at laboratory method detection limit.

Table 4.
A Summary of the Calculated Purge Volumes

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Amount of Product (feet)	Total Well Depth (feet)	Water Column ¹ (feet)	Well Diameter (inches)	Conversion Factor (gallons/feet)	Calculated Purge Volume (gallons)
MW01A	10/16/14	30.45	34.21	3.76	44.32	12.91	2.0	0.163	12.63
	11/05/14	30.70	33.49	2.79		12.91			12.63
MW02	10/16/14	30.59	34.07	3.48	48.63	17.15	2.0	0.163	16.77
	11/05/14	30.80	34.10	3.30		16.98			16.61
MW03	10/16/14	31.85	35.47	3.62	48.29	15.51	2.0	0.163	15.17
	11/05/14	31.52	34.42	2.90		16.00			15.65
MW04	11/05/14	NA ²	32.46	NA	45.34	12.88	2.0	0.163	12.60
MW05	11/05/14	NA	32.34	NA	45.25	12.91	2.0	0.163	12.63
MW06	10/16/14	NA	31.09	NA	45.05	13.96	2.0	0.163	13.65
	11/05/14	NA	31.16	NA		13.89			13.58
MW07	10/16/14	NA	31.38	NA	44.23	12.85	2.0	0.163	12.57
	11/05/14	NA	31.57	NA		12.66			12.38
MW08	11/06/14	NA	34.20	NA	45.23	11.03	2.0	0.163	10.79
MW09	11/06/14	NA	34.60	NA	45.21	10.61	2.0	0.163	10.38
MW10	11/06/14	NA	35.10	NA	42.14	7.04	2.0	0.163	6.89
MW11	11/06/14	NA	35.20	NA	45.15	9.95	2.0	0.163	9.73
MW12	10/16/14	31.448	32.34	0.89	44.49	12.79	2.0	0.163	12.51
	11/05/14	31.79	32.05	0.26		12.63			12.35
MW13	11/05/14	NA	32.22	NA	45.04	12.82	2.0	0.163	12.54
MW14	10/16/14	31.67	35.55	3.88	44.12	11.46	2.0	0.163	11.21
	11/05/14	32.00	34.66	2.66		11.44			11.19

Table 4 (Cont'd).
A Summary of the Calculated Purge Volumes

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Amount of Product (feet)	Total Well Depth (feet)	Water Column ¹ (feet)	Well Diameter (inches)	Conversion Factor (gallons/feet)	Calculated Purge Volume (gallons)
MW15	10/16/14	32.72	35.18	2.46	44.37	11.02	2.0	0.163	10.78
	11/05/14	32.90	35.33	2.43		10.85			10.61
MW16	11/06/14	NA	33.75	NA	45.23	11.48	2.0	0.163	11.23
MW17	11/06/14	NA	32.12	NA	40.23	8.11	2.0	0.163	7.93
MW18	10/16/14	NA	34.23	NA	43.83	9.60	2.0	0.163	9.39
	11/05/14	NA	34.43	NA		9.40			9.19
MW19	10/16/14	33.33	33.55	0.22	44.12	10.73	2.0	0.163	10.49
	11/05/14	33.46	33.87	0.41		10.55			10.32
MW20	10/16/14	NA	35.41	NA	44.30	8.89	2.0	0.163	8.69
	11/06/14	NA	35.66	NA		8.64			8.45
MW21	10/16/14	33.30	35.75	2.45	43.13	9.20	2.0	0.163	9.00
	11/05/14	33.39	33.96	0.57		9.59			9.38
MW22	10/16/14	31.15	34.05	2.90	43.35	11.46	2.0	0.163	11.21
	11/05/14	31.59	33.83	2.24		11.19			10.94
MW23	10/16/14	30.61	32.27	1.66	43.48	12.44	2.0	0.163	12.17
	11/05/14	30.74	32.38	1.64		12.32			12.05
MW24	10/16/14	NA	32.10	NA	43.40	11.30	2.0	0.163	11.05
	11/05/14	32.36	32.42	0.06		11.02			10.78
MW25	10/16/14	31.22	32.32	1.10	43.60	12.10	2.0	0.163	11.83
	11/05/14	31.36	31.46	0.10		12.21			11.94
MW26	10/16/14	30.62	34.96	4.34	43.86	12.13	2.0	0.163	11.86
	11/05/14	30.95	34.82	3.87		11.92			11.66

Table 4 (Cont'd).
A Summary of the Calculated Purge Volumes

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Amount of Product (feet)	Total Well Depth (feet)	Water Column ¹ (feet)	Well Diameter (inches)	Conversion Factor (gallons/feet)	Calculated Purge Volume (gallons)
MW27	10/16/14	NA	30.34	NA	44.48	14.14	2.0	0.163	13.83
	11/05/14	NA	30.47	NA		14.01			13.70
MW28	10/16/14	31.75	34.95	3.20	44.30	11.73	2.0	0.163	11.47
	11/05/14	32.12	34.49	2.37		11.57			11.32

¹If free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

²NA = Not applicable.

Table 5.

A Summary of Historic and Current Monitoring Well Dissolved Phase Analytical Results

Well Identification	Date	TPH-GRO ¹	TPH-DRO ²	Benzene ³	Toluene	Ethyl-benzene	Xylenes	MTBE	Naphthalene
MW01A	05/14/14	187,000	9,090	4,950	46,300	4,060	22,000	4,530	439
	11/05/14	158,000	NA ⁴	6,470	36,100	3,880	21,500	17,500	438
MW02	05/14/14	190,000	11,300	6,280	42,900	4,170	22,000	11,700	912
	11/05/14	171,000	NA	8,330	43,400	4,030	21,600	17,500	ND ⁵
MW03	05/14/14	122,000	5,550	2,130	27,000	3,100	16,400	1,750	444
	11/05/14	158,000	NA	7,140	42,000	3,850	20,900	8,080	463
MW04	03/12/14	3,870	1,220	483	81.4	30.4	347	1,500	11.7
	05/14/14	4,130	1,220	532	23.2	14.6	303	1,150	ND
	11/05/14	4,920	NA	680	4.25	12.4	375	2,340	ND
MW05	03/12/14	4,080	607	501	47.2	81.9	590	1,350	9.77
	05/14/14	651	120	67.3	3.32	13.1	94.8	228	ND
	11/05/14	5,680	NA	739	51.5	185	1,630	1,460	21.5
MW06	03/12/14	136	230	ND	3.18	2.98	18.7	4.46	ND
	05/14/14	ND	289	ND	ND	ND	ND	1.12	ND
	11/05/14	391	NA	5.24	7.12	4.28	5.06	111	ND
MW07	05/14/14	34,700	4,980	1,090	5,070	1,070	6,360	625	166
	11/05/14	63,200	NA	2,870	13,400	2,030	10,500	3,110	191
MW08	05/14/14	ND	145	ND	ND	ND	ND	1.32	ND
	11/06/14	ND	NA	ND	ND	ND	ND	ND	ND
MW09	05/14/14	ND	ND	ND	ND	ND	ND	ND	ND
	11/06/14	ND	NA	ND	ND	ND	ND	ND	ND
MW10	05/14/14	ND	ND	ND	ND	ND	ND	129	ND
	11/06/14	192	NA	ND	ND	ND	ND	238	ND
MW11	05/14/14	ND	107	ND	ND	ND	ND	ND	ND
	11/06/14	ND	NA	1.2	5.66	ND	ND	10	ND
MW12	05/14/14	124,000	23,700	762	19,800	5,260	28,800	117	710
	11/05/14	71,200	NA	167	5,140	2,390	15,400	33.1	1,250
MW13	05/14/14	ND	ND	ND	ND	ND	ND	9.14	ND
	11/05/14	ND	NA	ND	ND	ND	ND	28.9	ND

Table 5 (Cont'd).

A Summary of Historic and Current Monitoring Well Dissolved Phase Analytical Results

Well Identification	Date	TPH-GRO ¹	TPH-DRO ²	Benzene ³	Toluene	Ethyl-benzene	Xylenes	MTBE	Naphthalene
MW14	05/14/14	189,000	7,380	7,720	44,800	5,260	29,400	5,850	628
	11/05/14	154,000	NA	7,200	39,200	3,890	21,500	4,830	455
MW15	05/14/14	178,000	8,500	9,310	48,700	5,160	27,500	4,040	547
	11/05/14	158,000	NA	7,890	41,200	3,980	21,700	2,270	472
MW16	05/14/14	ND	ND	ND	ND	ND	ND	8.82	ND
	11/06/14	ND	NA	ND	ND	ND	ND	13.4	ND
MW17	05/14/14	ND	ND	ND	ND	ND	ND	ND	ND
	11/06/14	ND	NA	ND	ND	ND	ND	ND	ND
MW18	05/14/14	ND	234	1.65	ND	ND	3.97	ND	ND
	11/05/14	ND	NA	ND	ND	ND	ND	ND	ND
MW19	05/14/14	29,900	7,220	315	4,400	994	4,680	97.3	179
	11/05/14	17,000	NA	201	2,160	526	3,020	39.3	244
MW20	11/06/14	146	NA	ND	ND	ND	ND	20.4	ND
MW21	11/05/14	154,000	NA	7,710	40,700	3,710	20,200	1,820	1,100
MW22	11/05/14	124,000	NA	5,060	26,200	3,580	18,000	2,030	527
MW23	11/05/14	142,000	NA	3,850	34,600	4,300	22,600	2,080	494
MW24	11/05/14	156,000	NA	5,800	36,700	4,000	23,200	2,350	731
MW25	11/05/14	135,000	NA	3,620	29,300	4,080	21,200	2,680	590
MW26	11/05/14	158,000	NA	6,330	38,900	3,610	19,200	5,400	425
MW27	11/05/14	755	NA	6.61	5.75	2.61	34.7	27.1	6.08
MW28	11/05/14	99,600	NA	2,500	17,700	3,480	17,800	981	483

¹TPH (gasoline range organics) analysis via U.S. EPA SW-846 method 8015B; reported in micrograms per liter (µg/L).

²TPH (diesel range organics) analysis via U.S. EPA SW-846 method 8015B; reported in µg/L.

³BTEX, MTBE, naphthalene analysis via U.S. EPA SW-846 method 8021B; reported in µg/L.

⁴NA = Not applicable.

⁵ND = Non detected at laboratory method detection limit.

Table 6.

A Summary of Historic and Current Drinking Water Dissolved Phase Analytical Results

Receptor ID	Sample Date	VOCs ¹	SVOCs ²
DW01	01/31/14	ND ³ for all VOCs via 8260	NA ⁴
	02/10/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	05/14/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	11/07/14	ND for all VOCs via 8260	NA
DW02 (outside hydrant)	01/31/14	MTBE = 76.9; ND for all other VOCs via 8260	NA
	02/07/14	MTBE = 74.6; ND for all other VOCs via 8260	NA
	02/10/14	NA	ND for all SVOCs via 8270
	02/19/14 ⁵	MTBE = 35.1; ND for all other VOCs via 8260	ND for all SVOCs via 8270
	05/15/14 ⁵	MTBE = 56.7 Diisopropyl ether (DIPE) = 0.7 ND for all other VOCs via 8260	NA
	08/26/14 ⁵	MTBE = 33.5; ND for all other VOCs via 8260	NA
DW02 (kitchen faucet)	12/18/14 ⁵	MTBE = 14.9; ND for all other VOCs via 8260	NA
	02/07/14	MTBE = 76.5; ND for all other VOCs via 8260	NA
DW03	02/10/14	NA	ND for all SVOCs via 8270
	01/31/14	Benzene = 14.4 1,2-Dichloroethane = 1.24 MTBE = 38.7 ND for all other VOCs via 8260	NA
	02/07/14	MTBE = 2.71; ND for all other VOCs via 8260	NA
	02/17/14	MTBE = 1.83; ND for all other VOCs via 8260	ND for all SVOCs via 8270
	02/19/14 ⁵	MTBE = 5.0; ND for all other VOCs via 8260	ND for all SVOCs via 8270
	04/16/14 ⁵	MTBE = 4.4; ND for all other VOCs via 8260	NA
	10/30/14 ⁵	TAME = 0.8 Benzene = 6.7 1,2-Dichloroethane = 4.6 MTBE = 63.5 Xylenes = 7.9 ND for all other VOCs via 8260	NA
DW04 DW05 DW06	Access has not been obtained to collect a drinking water sample.		

Table 6 (Cont'd).

A Summary of Historic and Current Drinking Water Dissolved Phase Analytical Results

Receptor ID	Sample Date	VOCs ¹	SVOCs ²
DW07 DW08	03/12/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	05/14/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	11/07/14	ND for all VOCs via 8260	NA
DW09	02/25/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	03/12/14	ND for all VOCs via 8260	Bis(2-ethylhexyl) phthalate = 21.0; ND for all other SVOCs via 8270
DW10	02/10/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
DW11	02/10/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
DW12	01/31/14	MTBE = 3.62; ND for all other VOCs via 8260	NA
	02/07/14	MTBE = 3.40; ND for all other VOCs via 8260	NA
	02/10/14	NA	ND for all SVOCs via 8270
	03/06/14 ⁵	MTBE = 3.5; ND for all other VOCs via 8260	ND for all SVOCs via 8270
	05/15/14 ⁵	MTBE = 3.4; ND for all other VOCs via 8260	NA
	10/30/14 ⁵	MTBE = 3.5; ND for all other VOCs via 8260	NA
DW13	01/31/14	ND for all VOCs via 8260	NA
	02/10/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	05/14/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	11/07/14	ND for all VOCs via 8260	NA
DW14	01/31/14	ND for all VOCs via 8260	NA
	02/10/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	05/14/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	11/07/14	ND for all VOCs via 8260	NA

Table 6 (Cont'd).

A Summary of Historic and Current Drinking Water Dissolved Phase Analytical Results

Receptor ID	Sample Date	VOCs ¹	SVOCs ²
DW15	02/10/14	MTBE = 10.9; ND for all other VOCs via 8260	ND for all SVOCs via 8270
	02/17/14	MTBE = 15.5; ND for all other VOCs via 8260	ND for all SVOCs via 8270
	02/19/14 ³	MTBE = 15.7; ND for all other VOCs via 8260	ND for all SVOCs via 8270
	03/14/14 ⁵	Acetone = 1,270 2-Butanone (MEK) = 926 MTBE = 15.6 ND for all other VOCs via 8260	NA
	04/16/14 ⁵	MTBE = 18.8; ND for all other VOCs via 8260	NA
	05/15/14 ⁵	MTBE = 18.3; ND for all other VOCs via 8260	NA
	08/26/14 ⁵	MTBE = 25.2; ND for all other VOCs via 8260	NA
	12/18/14 ⁵	MTBE = 17.3; ND for all other VOCs via 8260	NA
DW16	01/31/14	ND for all VOCs via 8260	NA
	02/10/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	07/01/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	08/01/14	Chloroform = 1.84 ND for all VOCs via 8260	ND for all SVOCs via 8270
	09/25/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
DW17	01/31/14	ND for all VOCs via 8260	NA
	02/10/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	11/07/14	ND for all VOCs via 8260	NA
DW18	02/26/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	03/12/14	ND for all VOCs via 8260	Bis(2-ethylhexyl) phthalate = 26.1; ND for all other SVOCs via 8270
DW19	02/25/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	03/12/14	ND for all VOCs via 8260	ND for all SVOCs via 8270
	06/25/14	ND for all VOCs via 8260	NA
	11/20/14	ND for all VOCs via 8260	NA

¹VOCs (Volatile Organic Compounds) analysis via U.S. EPA SW-846 method 8260B; reported in micrograms per liter (µg/L).

²SVOCs (Semi-Volatile Organic Compounds) analysis via U.S. EPA SW-846 method 8270C; reported in µg/L.

³ND = Non Detected at laboratory method detection limits.

⁴NA = Not Analyzed.

⁵Drinking water samples collected on behalf of the VA DEQ AWS program.

Table 7.
A Summary of Historic & Current Free Product Thicknesses

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
MW01	02/27/14	31.21	32.50	1.29 ¹
	03/06/14	31.33	31.91	0.58 ¹
	03/10/14	31.34	31.96	0.62 ¹
	03/12/14	31.05	31.67	0.62 ¹
	03/14/14	31.29	31.89	0.60 ¹
	03/19/14	32.90	33.20	0.30 ¹
	03/28/14	31.21	31.68	0.47 ¹
	04/07/14	31.08	31.24	0.16 ¹
	04/16/14	31.15	31.29	0.14 ¹
	04/25/14	30.62	30.84	0.22 ¹
05/02/14	NA ²	30.64	NA	
MW01A	05/07/14	30.56	31.85	1.29
	05/14/14	29.98	33.75	3.77
	05/23/14	29.99	33.90	3.91
	06/06/14	30.34	34.52	4.18
	06/13/14	30.61	34.50	3.89
	06/18/14	31.05	33.90	2.85
	06/25/14	31.12	34.16	3.04
	07/01/14	31.30	33.98	2.68
	07/10/14	31.44	34.18	2.74
	07/16/14	31.63	33.63	2.00
	07/24/14	31.70	33.70	2.00
	07/30/14	31.92	33.55	1.63
	08/05/14	32.00	33.03	1.03
	08/19/14	31.26	33.29	2.03
09/25/14	30.08	32.48	2.40	
10/16/14	30.45	34.21	3.76	
11/05/14	30.70	33.49	2.79	
MW02	02/27/14	30.27	36.24	5.97
	03/06/14	30.38	35.91	5.53
	03/10/14	30.22	35.87	5.65
	03/12/14	30.11	35.65	5.54
	03/14/14	30.41	35.61	5.20
	03/19/14	30.30	35.92	5.62

Table 7 (Cont'd).
A Summary of Historic & Current Free Product Thicknesses

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
MW02 (Cont'd)	03/28/14	30.28	35.30	5.02
	04/07/14	30.18	35.03	4.85
	04/16/14	30.36	34.90	4.54
	04/25/14	29.89	34.27	4.38
	05/02/14	29.97	34.03	4.06
	05/07/14	30.11	33.87	3.76
	05/14/14	30.19	33.82	3.63
	05/23/14	30.25	33.84	3.59
	06/06/14	30.69	34.24	3.55
	06/13/14	30.81	34.44	3.63
	06/18/14	30.98	34.52	3.54
	06/25/14	31.07	34.58	3.51
	07/01/14	31.18	34.70	3.52
	07/10/14	31.35	34.88	3.53
	07/16/14	31.38	34.94	3.56
	07/24/14	31.44	34.86	3.42
	07/30/14	31.54	34.97	3.43
	08/05/14	31.58	34.97	3.39
	08/19/14	31.16	34.32	3.16
09/25/14	30.19	33.08	2.89	
10/16/14	30.59	34.07	3.48	
11/05/14	30.80	34.10	3.30	
MW03	02/27/14	31.50	35.82	4.32
	03/06/14	31.37	36.05	4.68
	03/10/14	31.18	36.13	4.95
	03/12/14	31.32	35.26	3.94
	03/14/14	31.40	35.70	4.30
	03/19/14	31.11	35.90	4.79
	03/28/14	31.030	36.05	5.02
	04/07/14	30.85	36.06	5.21
	04/16/14	31.08	35.91	4.83
	04/25/14	30.60	35.78	5.18
	05/02/14	30.65	35.56	4.91
	05/07/14	30.72	35.51	4.79

Table 7 (Cont'd).
A Summary of Historic & Current Free Product Thicknesses

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
MW03 (Cont'd)	05/14/14	30.67	35.70	5.03
	05/23/14	30.63	35.95	5.32
	06/06/14	30.98	36.18	5.20
	06/13/14	31.23	36.23	5.00
	06/18/14	31.52	35.89	4.37
	06/25/14	31.59	36.15	4.56
	07/01/14	31.70	36.02	4.32
	07/10/14	31.87	36.07	4.20
	07/16/14	31.98	35.95	3.97
	07/24/14	32.02	35.82	3.80
	07/30/14	33.23	35.90	2.67
	08/05/14	32.31	35.65	3.34
	08/19/14	31.87	35.43	3.56
	09/25/14	30.58	35.10	4.52
	10/16/14	31.85	35.47	3.62
11/05/14	31.52	34.52	3.00	
MW07	05/07/14	30.98	31.01	0.03
	05/14/14	NA	31.01	NA
	05/23/14	31.08	31.12	0.04
	06/06/14	31.46	31.50	0.04
	06/13/14	NA	31.66	NA
	06/18/14	NA	31.83	NA
	06/25/14	NA	32.10	NA
	07/01/14	NA	32.03	NA
	07/10/14	NA	32.05	NA
	07/16/14	NA	32.08	NA
	07/24/14	NA	32.28	NA
	07/30/14	NA	32.41	NA
	08/05/14	NA	32.40	NA
	08/19/14	NA	31.94	NA
	09/25/14	30.81	30.82	0.01
10/16/14	NA	31.38	NA	
11/05/14	NA	31.57	NA	

Table 7 (Cont'd).
A Summary of Historic & Current Free Product Thicknesses

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
MW12	05/07/14	30.49	31.70	1.21
	05/14/14	30.43	32.12	1.69
	05/23/14	30.62	32.14	1.52
	06/06/14	31.28	32.05	0.77
	06/13/14	31.64	32.07	0.43
	06/18/14	31.90	32.00	0.10
	06/25/14	32.02	32.15	0.13
	07/01/14	NA	32.17	NA
	07/10/14	32.29	32.49	0.20
	07/16/14	32.30	32.34	0.04
	07/24/14	32.40	32.52	0.12
	07/30/14	32.50	32.64	0.14
	08/05/14	32.53	32.70	0.17
	08/19/14	32.00	32.12	0.12
	09/25/14	30.74	31.37	0.63
	10/16/14	31.48	32.34	0.86
11/05/14	31.79	32.05	0.26	
MW14	05/07/14	31.33	34.44	3.11
	05/14/14	31.44	34.40	2.96
	05/23/14	31.42	34.49	3.07
	06/06/14	31.46	35.40	3.94
	06/13/14	31.72	35.55	3.83
	06/18/14	32.09	35.05	2.96
	06/25/14	32.13	35.22	3.09
	07/01/14	32.28	35.17	2.89
	07/10/14	32.30	35.19	2.89
	07/16/14	32.57	34.90	2.33
	07/24/14	32.57	35.08	2.51
	07/30/14	32.83	34.70	1.87
	08/05/14	33.05	34.15	1.10
	08/19/14	32.36	34.79	2.43
	09/25/14	31.00	34.57	3.57
	10/16/14	31.67	35.55	3.88
11/05/14	32.00	34.66	2.66	

Table 7 (Cont'd).
A Summary of Historic & Current Free Product Thicknesses

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
MW15	05/07/14	32.37	34.88	2.51
	05/14/14	32.39	34.95	2.56
	05/23/14	32.44	34.97	2.53
	06/06/14	32.68	35.39	2.71
	06/13/14	32.85	35.59	2.74
	06/18/14	33.02	35.65	2.63
	06/25/14	33.11	35.83	2.72
	07/01/14	33.18	35.88	2.70
	07/10/14	33.30	36.03	2.73
	07/16/14	33.48	36.32	2.84
	07/24/14	33.39	36.06	2.67
	07/30/14	33.52	36.12	2.60
	08/05/14	33.56	36.07	2.51
	08/19/14	33.26	35.60	2.34
	09/25/14	32.25	34.30	2.05
10/16/14	32.72	35.18	2.46	
11/05/14	32.90	35.33	2.43	
MW19	05/07/14	NA	33.12	NA
	05/14/14	33.10	33.27	0.17
	05/23/14	33.12	33.31	0.19
	06/06/14	33.38	33.78	0.40
	06/13/14	33.56	33.84	0.28
	06/18/14	33.56	34.12	0.56
	06/25/14	33.88	33.98	0.10
	07/01/14	33.90	34.11	0.21
	07/10/14	34.08	34.14	0.06
	07/16/14	34.08	34.12	0.04
	07/24/14	34.12	34.30	0.18
	07/30/14	34.20	34.45	0.25
	08/05/14	34.28	34.36	0.08
	08/19/14	33.86	34.01	0.15
09/25/14	32.60	32.80	0.20	

Table 7 (Cont'd).
A Summary of Historic & Current Free Product Thicknesses

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
MW19 (Cont'd)	10/16/14	33.33	33.55	0.22
	11/05/14	33.46	33.87	0.41
MW21	08/05/14	34.08	36.63	2.55
	08/19/14	33.75	36.09	2.34
	09/25/14	32.60	34.70	2.10
	10/16/14	33.30	35.75	2.45
	11/05/14	33.39	35.96	2.57
MW22	08/05/14	32.19	34.15	1.96
	08/19/14	31.70	34.21	2.51
	09/25/14	30.70	32.30	1.60
	10/16/14	31.15	34.05	2.90
	11/05/14	31.59	33.83	2.24
MW23	08/05/14	31.70	32.85	1.15
	08/19/14	31.19	32.25	1.06
	09/25/14	30.09	31.42	1.33
	10/16/14	30.61	32.27	1.66
	11/05/14	30.74	32.38	1.64
MW24	08/05/14	NA	32.90	NA
	08/19/14	NA	32.49	NA
	09/25/14	NA	31.61	NA
	10/16/14	NA	32.10	NA
	11/05/14	32.36	32.43	0.06
MW25	08/05/14	NA	NA	NA
	08/19/14	NA	NA	NA
	09/25/14	30.79	31.00	0.21
	10/16/14	31.22	32.32	1.10
	11/05/14	31.36	31.46	0.10
MW26	08/05/14	NA	32.78	NA
	08/19/14	31.49	35.09	3.60
	09/25/14	30.19	34.17	3.98
	10/16/14	30.62	34.96	4.34
	11/05/14	30.95	34.82	3.87

Table 7 (Cont'd).
A Summary of Historic & Current Free Product Thicknesses

Well Identification	Date	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
MW28	08/05/14	NA	NA	NA
	08/19/14	32.35	34.89	2.54
	09/25/14	31.27	34.25	2.98
	10/16/14	31.75	34.95	3.20
	11/05/14	32.12	34.49	2.37

¹Well screen installed below groundwater; product thickness is likely higher than the measured value.

²NA = Not applicable.

Table 8.
A Summary of Historic & Current Free Product Recovery Events

Event Date	Well Identification	Pre-Event Product Thickness (feet)	Post-Event Product Thickness (feet)	Approximate Time Vacuum Applied (minutes)	Total Recovery (gallons)	Cumulative Recovery (gallons)
02/27/14	MW01	1.29	0.00	100	261	261
	MW02	5.57	1.11	100		
	MW03	4.32	0.00	50		
03/10/14	MW01	0.62	0.00	60	300	561
	MW02	5.65	0.73	60		
	MW03	4.95	0.00	65		
03/14/14	MW01	0.60	0.00	60	175	736
	MW02	5.20	0.09	60		
	MW03	4.30	0.00	95		
03/19/14	MW01	0.30	0.00	30	248	984
	MW02	5.62	0.75	50		
	MW03	4.79	0.00	45		
03/28/14	MW01	0.47	0.00	60	400	1,384
	MW02	5.02	0.07	85		
	MW03	5.02	0.00	60		
04/07/14	MW01	0.16	0.00	60	375	1,759
	MW02	4.85	0.02	60		
	MW03	5.21	0.00	60		
04/16/14	MW01	0.14 ¹	0.00	60	375	2,134
	MW02	4.54	0.00	60		
	MW03	4.83	0.00	60		
04/25/14	MW01	0.22 ¹	0.00	60	350	2,484
	MW02	4.38	0.33	55		
	MW03	5.18	0.00	55		
05/02/14	MW01	0.00 ¹	0.00	60	300	2,784
	MW02	4.06	0.94	60		
	MW03	4.91	0.00	60		

Table 8 (Cont'd).

A Summary of Historic & Current Free Product Recovery Events

Event Date	Well Identification	Pre-Event Product Thickness (feet)	Post-Event Product Thickness (feet)	Approximate Time Vacuum Applied (minutes)	Total Recovery (gallons)	Cumulative Recovery (gallons)
05/07/14	MW01A	1.29	0.00	25	300	3,084
	MW02	3.76	0.90	40		
	MW03	4.79	0.00	30		
	MW07	0.03	0.00	20		
	MW12	1.21	0.00	20		
	MW14	3.11	0.00	45		
	MW15	2.51	1.29	45		
05/14/14	MW01A	3.77	0.05	35	170	3,254
	MW02	3.63	0.00	45		
	MW03	5.03	0.00	60		
	MW12	1.69	0.00	30		
	MW14	2.96	0.00	45		
	MW15	2.56	0.00	45		
05/23/14	MW01A	3.91	0.00	50	270	3,524
	MW02	3.59	0.02	40		
	MW03	5.32	0.00	50		
	MW12	1.52	0.00	30		
	MW14	3.07	0.00	40		
	MW15	2.53	0.05	30		
06/06/14	MW01A	4.18	0.00	30	175	3,699
	MW02	3.55	0.00	30		
	MW03	5.20	0.00	30		
	MW12	0.77	0.00	20		
	MW14	3.94	0.00	30		
	MW15	2.71	0.02	30		
	MW19	0.40	0.00	5		
06/13/14	MW01A	3.89	0.00	50	325	4,024
	MW02	3.63	0.00	50		
	MW03	5.00	0.00	60		
	MW12	0.43	0.00	35		
	MW14	3.83	0.00	40		
	MW15	2.74	1.02	65		

Table 8 (Cont'd).

A Summary of Historic & Current Free Product Recovery Events

Event Date	Well Identification	Pre-Event Product Thickness (feet)	Post-Event Product Thickness (feet)	Approximate Time Vacuum Applied (minutes)	Total Recovery (gallons)	Cumulative Recovery (gallons)
06/18/14	MW01A	2.85	0.00	30	160	4,184
	MW02	3.54	0.00	30		
	MW03	4.37	0.00	25		
	MW14	2.96	0.00	30		
	MW15	2.63	0.03	30		
	MW19	0.56	0.00	10		
06/25/14	MW01A	3.04	0.00	30	200	4,384
	MW02	3.51	0.00	30		
	MW03	4.56	0.00	30		
	MW12	0.13	0.00	10		
	MW14	3.09	0.00	30		
	MW15	2.72	0.00	30		
07/01/14	MW01A	2.68	0.00	30	175	4,559
	MW02	3.52	0.00	30		
	MW03	4.32	0.00	30		
	MW14	2.89	0.00	30		
	MW15	2.70	0.00	30		
	MW19	0.21	0.00	15		
07/10/14	MW01A	2.74	0.00	30	175	4,734
	MW02	3.53	0.00	30		
	MW03	4.20	0.00	35		
	MW12	0.20	0.00	15		
	MW14	2.89	0.02	30		
	MW15	2.73	0.00	30		
07/16/14	MW01A	2.00	0.00	20	145	4,879
	MW02	3.56	0.00	30		
	MW03	3.97	0.00	30		
	MW14	2.33	0.00	30		
	MW15	2.84	0.00	30		

Table 8 (Cont'd).

A Summary of Historic & Current Free Product Recovery Events

Event Date	Well Identification	Pre-Event Product Thickness (feet)	Post-Event Product Thickness (feet)	Approximate Time Vacuum Applied (minutes)	Total Recovery (gallons)	Cumulative Recovery (gallons)
07/24/14	MW01A	2.00	0.00	30	150	5,029
	MW02	3.42	0.00	30		
	MW03	3.80	0.00	30		
	MW14	2.51	0.00	30		
	MW15	2.67	0.20	40		
07/30/14	MW01A	1.63	0.00	30	170	5,199
	MW02	3.43	0.00	30		
	MW03	2.67	0.00	30		
	MW14	1.87	0.00	30		
	MW15	2.60	0.18	60		
	MW19	0.25	0.00	10		
10/16/14	MW01A	3.76	0.02	30	522	5,721
	MW02	3.48	0.07	30		
	MW03	3.62	0.00	30		
	MW07	0.00	0.00	30		
	MW12	0.86	0.00	25		
	MW14	3.88	0.00	30		
	MW15	2.46	0.29	30		
	MW19	0.22	0.00	10		
	MW20	0.00	0.00	20		
	MW21	2.45	0.00	20		
	MW22	2.90	0.10	30		
	MW23	1.66	0.00	20		
	MW24	0.00	0.00	10		
	MW25	1.10	0.00	20		
	MW26	4.34	0.00	30		
MW27	0.00	0.00	30			
MW28	3.20	0.00	30			
Greene performed a Dual-Phase Extraction Pilot Study Event on November 6, 2014 and from November 13, 2014 to November 26, 2014. A mobile DPE remediation system was utilized to perform the recovery of free phase petroleum and petroleum impacted groundwater.					27,838	33,559

¹Well screen installed below groundwater; product thickness is likely higher than the measured value.

Table 9.
A Summary of Free Product Analytical Results

Sample ID	Date	Specific Gravity	Octane	Paraffin (wt%)	Isoparaffins (wt%)	Aromatics (wt%)	Naphthenics (wt%)	Olefins (wt%)	Benzene (wt%)	Toluene (wt%)	Ethylbenzene (wt%)	Xylenes (wt%)	MTBE (wt%)	Naphthalene (wt%)	ethyl tert-butyl ether (wt%)	tert-Amyl methyl ether (wt%)	diisopropyl ether (wt%)	tert-Amyl alcohol (wt%)
FP01	03/19/14	0.7439	89.530	7.7060	38.8390	42.1237	5.3421	5.9892	0.288	9.626	2.219	12.649	0.02	0.297	ND ¹	ND	ND	ND

¹ND = Non detected at laboratory method detection limits.

Table 10.

A Summary of the Individual Well Pilot Study Event Vapor Phase Analytical Results

Sample Identification	Date	Approximate Runtime ¹ (Hours)	TVPH ²	Benzene ³	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW21-1	11/06/14	2	156,000	1,720	16,000	1,970	7,290	ND ⁴
MW03-1	11/13/14	1	49,900	281	6,540	1,830	8,440	ND
MW03-2	11/13/14	7.25	28,500	252	3,470	574	2,529	ND
MW03-3	11/14/14	22	18,900	165	2,040	424	2,014	ND
MW28-1	11/14/14	1	23,700	181	2,290	513	2,249	ND
MW28-2	11/14/14	7	12,800	117	1,210	242	1,046	ND
MW28-3	11/15/14	22.25	9,020	89.3	987	201	918	ND
MW26-1	11/15/14	1	10,400	109	1,050	226	1,096	ND
MW26-2	11/15/14	7.25	11,700	97.7	1,170	282	1,378	55.4
MW26-3	11/16/14	24	8,880	92.4	896	188	944	55.6
MW22-1	11/16/14	1	22,700	223	2,370	398	1,720	ND
MW22-2	11/16/14	7	11,700	145	1,140	175	688	ND
MW22-3	11/17/14	22.5	10,700	174	1,050	178	745	ND
MW02-1	11/17/14	1	37,800	448	3,740	393	1,591	130
MW02-2	11/17/14	7	28,800	301	3,050	451	1,962	126
MW02-3	11/18/14	24	20,900	215	2,410	430	1,933	108
MW14-1	11/18/14	1	13,900	119	1,610	340	1,580	ND
MW14-2	11/18/14	7	14,400	112	1,590	336	1,571	ND
MW14-3	11/19/14	23.5	11,800	87.2	1,400	328	1,600	ND
MW23-1	11/19/14	1	10,500	118	1,060	166	737	62.7
MW23-2	11/19/14	7	9,400	114	934	144	630	62.0
MW23-3	11/20/14	23.75	8,020	95.1	822	142	656	57.0

¹Approximate DPE system runtime from when extraction activities began on the individual well.

²TVPH (total volatile petroleum hydrocarbons) analysis via U.S. EPA SW-846 method 18; reported in milligrams per cubic meters (mg/m³).

³BTEX, MTBE, naphthalene analysis via U.S. EPA SW-846 method 18; reported in mg/m³.

⁴ND = Non detected at laboratory method detection limit.

Table 11.

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW21

DPE Remediation System	Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)
	11/06/14	0930	23.50	22.00	15.00	0.15	0.40	110.00	3,081	NA ¹
		1030	23.50	24.00	15.00	0.35	0.60	225.00	604.9	96.3
		1130	23.50	24.50	15.00	0.35	0.60	235.00	12.6	20.6
		1230	23.50	24.50	15.00	0.30	0.60	235.00	474.5	23.5
		1330	23.50	23.50	15.00	0.30	0.60	220.00	78.2	NA
		1430	23.50	23.50	15.00	0.40	0.50	220.00	63.3	1,751
		1530	23.50	23.50	15.00	0.20	0.50	218.00	2,289	NA
	Average		23.50	23.64	15.00	0.29	0.54	209.00	943.36	472.8

Vacuum Influence	Date	Time	Magnehelic Readings (inH ₂ O)													
			MW01A	MW02	MW03	MW11	MW14	MW15	MW18	MW19	MW20	MW22	MW24	MW25	MW26	MW28
	11/06/14	1330	0.25	0.50	1.50	0.23	1.60	OL ²	0.18	2.50	0.25	0.50	0.15	OL	OL	0.70
		1430	0.25	0.55	1.50	0.26	1.65	7.10	0.18	2.50	0.27	0.52	0.20	0.23	1.00	0.80
1530		0.25	0.60	1.50	0.27	1.70	7.10	OL	OL	0.32	0.60	0.25	0.23	1.00	0.85	
Average		0.26	0.55	1.50	0.25	1.65	7.10	0.18	2.50	0.28	0.54	0.20	0.23	1.00	0.78	

Cone of Depression	Well ID	November 5-6, 2014 Gauging Event				No Event Performed				Drawdown (feet)
		Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
	Due to the limited runtime, Greene did not perform a gauging event to determine the drawdown of the groundwater table in selected monitoring wells.									

¹NA = Reading was not collected.²OL = Reading was determined to be an outlier and was eliminated following limited statistical analysis.³If free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 12.

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW03

Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)
11/13/14	1030	25.00	25.00	20.00	0.05	0.20	125.00	1,704	NA ¹
	1130	25.00	25.00	22.00	0.20	0.30	190.00	1,406	NA
	1230	25.00	24.50	18.00	0.25	0.40	205.00	1,168	52.3
	1330	24.50	22.00	16.00	0.40	0.40	180.00	155.5	365.1
	1430	24.50	21.50	14.00	0.75	0.40	190.00	130.0	1,265
	1530	20.00	17.00	12.50	0.75	2.20	200.00	321.0	164.6
	1630	20.00	17.00	12.50	0.75	2.30	200.00	70.5	918.0
	1730	20.00	17.00	12.50	1.00	2.30	200.00	395.1	535.0
11/14/14	0800	20.00	21.00	12.50	0.75	2.40	265.00	466.5	NA
Average		22.67	21.11	15.56	0.54	1.21	195.00	646.3	550.0

Date	Time	Magnehelic Readings (inH ₂ O)															
		MW01A	MW02	MW05	MW07	MW12	MW14	MW15	MW19	MW21	MW22	MW23	MW24	MW25	MW26	MW27	MW28
11/13/14	1030	OL ²	0.40	NA	0.00	NA	0.95	0.25	NA	NA	0.10	0.04	0.20	0.04	1.60	0.02	NA
	1130	OL	0.40	NA	0.17	OL	1.10	0.40	0.00	0.15	0.12	0.04	0.45	0.04	2.00	0.00	0.02
	1230	OL	0.20	0.00	0.00	OL	0.95	0.40	0.00	0.10	0.10	0.01	0.25	NA	1.95	0.00	0.00
	1330	0.55	1.10	NA	0.40	0.25	2.00	1.10	0.05	0.65	0.49	0.10	0.90	0.30	4.80	0.05	0.20
	1430	0.55	1.20	NA	0.45	0.25	2.20	1.10	0.05	0.70	0.45	0.09	0.90	0.26	4.40	0.05	0.25
	1530	0.50	1.10	NA	0.45	0.23	2.35	1.10	0.05	0.60	0.45	0.08	0.85	0.28	4.40	0.05	0.20
	1630	0.55	1.10	NA	0.30	0.15	2.45	1.10	0.05	0.60	0.45	0.08	0.80	0.30	4.50	0.00	0.20
	1730	0.55	1.00	NA	0.40	0.20	2.90	1.10	OL	0.75	0.45	OL	0.75	0.31	4.70	0.05	0.20
11/14/14	0800	OL	1.40	NA	0.50	0.20	3.70	1.35	OL	0.90	0.65	OL	1.00	0.44	5.80	0.05	0.25
Average		0.54	0.88	0.00	0.30	0.21	2.07	0.88	0.03	0.56	0.36	0.06	0.68	0.25	3.79	0.03	0.17

Table 12 (Cont'd).

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW03

Well ID	November 5-6, 2014 Gauging Event				November 14, 2014 Gauging Event				Drawdown (feet)
	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
MW01A	30.70	33.49	2.79	31.41	31.22	34.73	3.51	32.12	0.71
MW02	30.80	34.10	3.30	31.65	31.47	35.93	4.46	32.61	0.96
MW03	31.52	34.52	3.00	32.29	34.91	34.92	0.01	34.91	2.62
MW04	NA	32.46	0.00	32.46	NA	NA	NA	NA	NA
MW05	NA	32.34	0.00	32.34	NA	NA	NA	NA	NA
MW06	NA	31.16	0.00	31.16	NA	NA	NA	NA	NA
MW07	NA	31.57	0.00	31.57	NA	NA	NA	NA	NA
MW08	NA	34.20	0.00	34.20	NA	NA	NA	NA	NA
MW09	NA	34.60	0.00	34.60	NA	NA	NA	NA	NA
MW10	NA	35.10	0.00	35.10	NA	NA	NA	NA	NA
MW11	NA	35.20	0.00	35.20	NA	NA	NA	NA	NA
MW12	31.79	32.05	0.26	31.86	NA	NA	NA	NA	NA
MW13	NA	32.22	0.00	32.22	NA	NA	NA	NA	NA
MW14	32.00	34.66	2.66	32.68	33.86	36.27	2.41	34.48	1.80
MW15	32.90	35.33	2.43	33.52	NA	NA	NA	NA	NA
MW16	NA	33.75	0.00	33.75	NA	NA	NA	NA	NA
MW17	NA	32.12	0.00	32.12	NA	NA	NA	NA	NA
MW18	NA	34.43	0.00	34.43	NA	NA	NA	NA	NA
MW19	33.46	33.87	0.41	33.57	NA	NA	NA	NA	NA
MW20	NA	35.66	0.00	35.66	NA	NA	NA	NA	NA
MW21	33.39	35.96	2.57	34.05	NA	NA	NA	NA	NA
MW22	31.59	33.83	2.24	32.16	31.82	34.66	2.84	32.55	0.39
MW23	30.74	32.38	1.64	31.16	NA	NA	NA	NA	NA
MW24	32.36	32.42	0.06	32.38	33.61	34.39	0.78	33.81	1.43
MW25	31.36	31.46	0.10	31.39	31.67	31.74	0.07	31.69	0.30
MW26	30.95	34.82	3.87	31.94	36.23	37.44	1.21	36.54	4.60
MW27	NA	30.47	0.00	30.47	NA	NA	NA	NA	NA
MW28	32.12	34.49	2.37	32.73	NA	NA	NA	NA	NA

Cone of Depression

Reading was not collected.

Reading was determined to be an outlier and was eliminated following limited statistical analysis.

If free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 13.

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW28

Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)								
										DPE Remediation System	11/14/14	0945	20.00	18.50	14.50	0.60	2.60
1045	20.00	17.50	14.00	0.60	2.70	240.00	515.5	94.3									
1145	20.00	18.50	14.50	0.70	2.60	235.00	336.8	1,176									
1245	20.00	18.50	14.00	0.65	2.60	230.00	422.8	1,064									
1345	20.00	20.00	14.00	0.60	2.60	245.00	442.1	110.2									
1445	20.00	18.00	14.50	0.07	2.30	210.00	412.5	NA ¹									
1545	20.00	19.00	14.00	0.65	2.30	205.00	468.2	118.0									
11/15/14	0730	20.00	18.50	14.00	0.60	2.40	200.00	327.8	1,528								
Average		20.00	18.94	14.28	0.57	2.52	224.44	411.8	595.3								
Date	Time	Magnehelic Readings (inH ₂ O)															
		MW01A	MW02	MW03	MW07	MW12	MW14	MW15	MW19	MW21	MW22	MW23	MW24	MW25	MW26	MW27	
Vacuum Influence	11/14/14	0945	0.30	OL ²	0.35	OL	0.15	0.30	0.40	OL	0.50	OL	0.17	OL	OL	0.15	0.05
	1045	0.27	0.65	OL	0.10	0.12	0.20	0.40	2.80	0.60	2.85	0.16	0.05	OL	0.10	0.00	
	1145	0.23	0.60	OL	OL	OL	OL	OL	3.30	0.50	2.95	0.13	OL	1.10	0.10	0.00	
	1245	0.30	0.70	0.35	OL	0.10	0.20	0.40	3.70	0.60	3.10	0.18	0.05	1.10	0.30	0.00	
	1345	0.33	0.72	0.35	0.10	0.10	0.27	OL	4.30	0.60	3.15	0.20	0.10	1.20	0.20	0.03	
	1445	0.33	0.72	0.35	0.10	0.15	0.25	0.40	4.30	0.65	3.15	0.20	0.10	1.20	0.30	0.03	
	1545	0.35	0.72	0.35	OL	0.15	0.25	0.40	4.40	0.70	3.20	0.22	0.10	1.20	0.30	0.03	
11/15/14	0730	0.40	0.80	OL	0.10	0.15	0.25	OL	4.50	0.60	OL	OL	0.10	1.20	0.20	0.05	
Average		0.31	0.70	0.35	0.10	0.13	0.25	0.40	3.90	0.59	3.07	0.18	0.08	1.17	0.21	0.02	

Table 13 (Cont'd).

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW28

Well ID	November 5-6, 2014 Gauging Event				November 15, 2014 Gauging Event				Drawdown (feet)
	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
MW01A	30.70	33.49	2.79	31.41	NA	NA	NA	NA	NA
MW02	30.80	34.10	3.30	31.65	31.45	35.73	4.28	32.55	0.90
MW03	31.52	34.52	3.00	32.29	33.17	33.60	0.43	33.28	0.99
MW04	NA	32.46	0.00	32.46	NA	NA	NA	NA	NA
MW05	NA	32.34	0.00	32.34	NA	NA	NA	NA	NA
MW06	NA	31.16	0.00	31.16	NA	NA	NA	NA	NA
MW07	NA	31.57	0.00	31.57	NA	NA	NA	NA	NA
MW08	NA	34.20	0.00	34.20	NA	NA	NA	NA	NA
MW09	NA	34.60	0.00	34.60	NA	NA	NA	NA	NA
MW10	NA	35.10	0.00	35.10	NA	NA	NA	NA	NA
MW11	NA	35.20	0.00	35.20	NA	NA	NA	NA	NA
MW12	31.79	32.05	0.26	31.86	NA	NA	NA	NA	NA
MW13	NA	32.22	0.00	32.22	NA	NA	NA	NA	NA
MW14	32.00	34.66	2.66	32.68	32.45	35.52	3.07	33.24	0.56
MW15	32.90	35.33	2.43	33.52	33.60	35.73	2.13	34.15	0.63
MW16	NA	33.75	0.00	33.75	NA	NA	NA	NA	NA
MW17	NA	32.12	0.00	32.12	NA	NA	NA	NA	NA
MW18	NA	34.43	0.00	34.43	0.00	34.97	0.00	34.97	0.54
MW19	33.46	33.87	0.41	33.57	34.70	35.20	0.5	34.83	1.26
MW20	NA	35.66	0.00	35.66	NA	NA	NA	NA	NA
MW21	33.39	35.96	2.57	34.05	34.11	36.28	2.17	34.67	0.62
MW22	31.59	33.83	2.24	32.16	33.56	35.72	2.16	34.11	1.95
MW23	30.74	32.38	1.64	31.16	NA	NA	NA	NA	NA
MW24	32.36	32.42	0.06	32.38	NA	NA	NA	NA	NA
MW25	31.36	31.46	0.10	31.39	32.16	32.27	0.11	32.19	0.80
MW26	30.95	34.82	3.87	31.94	32.24	33.95	1.71	32.68	0.74
MW27	NA	30.47	0.00	30.47	NA	NA	NA	NA	NA
MW28	32.12	34.49	2.37	32.73	0.00	35.48	0.00	35.48	2.75

Reading was not collected.

Reading was determined to be an outlier and was eliminated following limited statistical analysis.

³If free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 14.

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW26

Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)
11/15/14	0845	20.00	18.00	15.00	0.60	2.40	245.00	831.9	256.6
	0945	20.00	18.00	15.50	0.60	2.30	245.00	748.7	299.1
	1045	20.00	18.00	15.50	0.65	2.50	240.00	560.9	NA ¹
	1145	20.00	18.00	15.50	0.60	2.50	240.00	576.1	315.2
	1245	20.00	19.00	15.00	0.70	2.60	245.00	598.3	334.1
	1345	20.00	22.00	15.00	0.65	2.60	250.00	598.5	323.2
	1445	20.00	18.00	15.50	0.60	2.60	235.00	601.6	NA
	1545	20.00	18.00	15.50	0.65	2.60	235.00	749.1	570.3
11/16/14	0800	20.00	19.00	15.00	0.60	2.70	255.00	655.2	335.0
Average		20.00	18.67	15.28	0.63	2.53	243.33	657.8	347.6

Date	Time	Magnehelic Readings (inH ₂ O)																			
		MW01A	MW02	MW03	MW04	MW05	MW06	MW07	MW08	MW12	MW13	MW14	MW15	MW19	MW21	MW22	MW23	MW24	MW25	MW27	MW28
11/15/14	0945	1.05	2.00	10.00	NA	NA	NA	1.00	NA	0.30	NA	OL ²	1.40	0.30	0.75	0.75	0.48	OL	0.50	0.05	0.40
	1045	1.05	2.00	10.00	NA	NA	NA	1.00	NA	0.30	NA	4.60	1.40	0.25	0.75	0.75	0.47	1.90	0.50	0.05	0.30
	1145	1.05	2.00	10.00	NA	NA	NA	1.00	NA	0.30	NA	4.60	1.40	0.25	0.75	0.75	0.48	OL	0.50	0.05	0.25
	1245	1.05	OL	11.00	NA	NA	NA	OL	NA	0.25	NA	4.60	1.30	0.17	0.70	0.70	OL	1.90	0.40	0.00	0.15
	1345	1.05	2.00	11.00	NA	NA	NA	1.05	NA	0.30	NA	4.60	1.30	0.19	0.70	0.70	0.50	1.90	0.50	0.05	0.20
	1445	OL	2.00	11.00	NA	NA	NA	1.05	NA	0.30	NA	OL	1.40	0.28	0.80	0.75	0.50	1.90	0.50	0.05	0.30
	1545	NA	NA	NA	2.00	0.75	0.00	OL	0.00	0.30	0.25	4.60	1.30	0.25	0.80	0.75	0.50	1.90	0.40	0.05	0.25
11/16/14	0800	1.05	2.00	11.00	NA	NA	NA	1.00	NA	0.25	NA	OL	OL	0.26	0.80	OL	OL	OL	0.50	0.00	0.35
Average		1.05	2.00	10.57	2.00	0.75	0.00	1.02	0.00	0.29	0.25	4.60	1.36	0.24	0.76	0.74	0.49	1.90	0.48	0.04	0.28

Table 14 (Cont'd).

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW26

Well ID	November 5-6, 2014 Gauging Event				November 16, 2014 Gauging Event				Drawdown (feet)
	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
MW01A	30.70	33.49	2.79	31.41	31.07	34.44	3.37	31.93	0.52
MW02	30.80	34.10	3.30	31.65	31.33	35.01	3.68	32.27	0.62
MW03	31.52	34.52	3.00	32.29	33.63	34.19	0.56	33.77	1.48
MW04	NA	32.46	0.00	32.46	0.00	32.99	0.00	32.99	0.53
MW05	NA	32.34	0.00	32.34	0.00	32.93	0.00	32.93	0.59
MW06	NA	31.16	0.00	31.16	NA	NA	NA	NA	NA
MW07	NA	31.57	0.00	31.57	0.00	32.08	0.00	32.08	0.51
MW08	NA	34.20	0.00	34.20	NA	NA	NA	NA	NA
MW09	NA	34.60	0.00	34.60	NA	NA	NA	NA	NA
MW10	NA	35.10	0.00	35.10	NA	NA	NA	NA	NA
MW11	NA	35.20	0.00	35.20	NA	NA	NA	NA	NA
MW12	31.79	32.05	0.26	31.86	NA	NA	NA	NA	NA
MW13	NA	32.22	0.00	32.22	NA	NA	NA	NA	NA
MW14	32.00	34.66	2.66	32.68	32.68	35.68	3.00	33.45	0.77
MW15	32.90	35.33	2.43	33.52	NA	NA	NA	NA	NA
MW16	NA	33.75	0.00	33.75	NA	NA	NA	NA	NA
MW17	NA	32.12	0.00	32.12	NA	NA	NA	NA	NA
MW18	NA	34.43	0.00	34.43	NA	NA	NA	NA	NA
MW19	33.46	33.87	0.41	33.57	NA	NA	NA	NA	NA
MW20	NA	35.66	0.00	35.66	NA	NA	NA	NA	NA
MW21	33.39	35.96	2.57	34.05	NA	NA	NA	NA	NA
MW22	31.59	33.83	2.24	32.16	NA	NA	NA	NA	NA
MW23	30.74	32.38	1.64	31.16	NA	NA	NA	NA	NA
MW24	32.36	32.42	0.06	32.38	33.00	33.53	0.53	33.14	0.76
MW25	31.36	31.46	0.10	31.39	31.82	31.93	0.11	31.85	0.46
MW26	30.95	34.82	3.87	31.94	0.00	33.99	0.00	33.99	2.05
MW27	NA	30.47	0.00	30.47	NA	NA	NA	NA	NA
MW28	32.12	34.49	2.37	32.73	NA	NA	NA	NA	NA

Reading was not collected.

Reading was determined to be an outlier and was eliminated following limited statistical analysis.

³If free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 15.
A Summary of the Individual Well Pilot Study Event – Monitoring Well MW22

Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)
11/16/14	0920	20.00	18.00	14.00	0.85	2.60	250.00	687.2	672.0
	1020	20.00	12.00	14.00	0.50	2.50	240.00	750.2	1,136
	1120	20.00	15.50	13.00	0.75	2.60	245.00	618.4	1,011
	1220	20.00	16.50	13.00	0.75	2.60	240.00	737.1	917.6
	1320	19.50	17.00	13.00	0.70	2.70	245.00	563.7	759.5
	1420	20.00	17.00	13.00	0.65	2.70	245.00	710.0	668.9
	1520	20.00	16.00	13.00	0.70	2.60	240.00	762.3	586.7
	1620	20.00	18.50	13.00	0.65	2.60	245.00	735.8	612.4
11/17/14	0800	19.50	19.00	13.00	0.65	2.60	250.00	559.6	NA ¹
Average		19.89	16.61	13.22	0.69	2.61	244.44	680.5	795.5

Date	Time	Magnehelic Readings (inH ₂ O)														
		MW01A	MW02	MW03	MW07	MW12	MW14	MW15	MW19	MW21	MW23	MW24	MW25	MW26	MW27	MW28
11/16/14	1020	OL ²	OL	OL	0.15	0.15	0.30	0.35	OL	0.25	0.42	0.10	OL	0.30	NA	3.00
	1120	0.90	2.00	0.66	0.15	0.20	0.30	0.40	0.43	0.25	0.48	0.05	1.75	0.33	0.03	3.00
	1220	0.93	1.95	0.65	0.10	0.20	0.30	0.35	0.50	0.25	0.48	0.00	1.60	0.33	0.00	3.50
	1320	0.95	2.00	0.69	0.17	0.20	0.15	0.40	0.57	0.27	0.50	0.05	1.90	0.35	0.00	3.50
	1420	0.95	2.00	0.71	0.17	0.17	0.30	0.40	0.65	0.30	0.47	0.05	1.95	0.35	0.00	3.50
	1520	1.00	2.05	0.79	0.25	0.23	NA	OL	0.80	0.43	0.53	0.15	2.05	0.40	0.03	4.00
	1620	1.00	2.05	0.74	0.25	0.25	0.40	0.45	0.75	0.40	0.53	0.15	2.05	0.40	0.05	4.00
11/17/14	0800	1.00	2.10	0.76	0.10	0.25	0.15	NA	OL	0.35	0.46	0.00	2.30	OL	0.00	4.50
Average		0.96	2.02	0.71	0.17	0.21	0.27	0.39	0.62	0.31	0.48	0.07	1.94	0.35	0.02	3.63

Table 15 (Cont'd).

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW22

Well ID	November 5-6, 2014 Gauging Event				November 17, 2014 Gauging Event				Drawdown (feet)
	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
MW01A	30.70	33.49	2.79	31.41	NA	NA	NA	NA	NA
MW02	30.80	34.10	3.30	31.65	31.63	35.78	4.15	32.69	1.04
MW03	31.52	34.52	3.00	32.29	0.00	32.94	0.00	32.94	0.65
MW04	NA	32.46	0.00	32.46	NA	NA	NA	NA	NA
MW05	NA	32.34	0.00	32.34	NA	NA	NA	NA	NA
MW06	NA	31.16	0.00	31.16	NA	NA	NA	NA	NA
MW07	NA	31.57	0.00	31.57	NA	NA	NA	NA	NA
MW08	NA	34.20	0.00	34.20	NA	NA	NA	NA	NA
MW09	NA	34.60	0.00	34.60	NA	NA	NA	NA	NA
MW10	NA	35.10	0.00	35.10	NA	NA	NA	NA	NA
MW11	NA	35.20	0.00	35.20	NA	NA	NA	NA	NA
MW12	31.79	32.05	0.26	31.86	NA	NA	NA	NA	NA
MW13	NA	32.22	0.00	32.22	NA	NA	NA	NA	NA
MW14	32.00	34.66	2.66	32.68	32.30	35.56	3.26	33.13	0.45
MW15	32.90	35.33	2.43	33.52	NA	NA	NA	NA	NA
MW16	NA	33.75	0.00	33.75	NA	NA	NA	NA	NA
MW17	NA	32.12	0.00	32.12	NA	NA	NA	NA	NA
MW18	NA	34.43	0.00	34.43	NA	NA	NA	NA	NA
MW19	33.46	33.87	0.41	33.57	34.60	35.07	0.47	34.72	1.15
MW20	NA	35.66	0.00	35.66	NA	NA	NA	NA	NA
MW21	33.39	35.96	2.57	34.05	34.07	36.13	2.06	34.60	0.55
MW22	31.59	33.83	2.24	32.16	0.00	35.94	0.00	35.94	3.78
MW23	30.74	32.38	1.64	31.16	NA	NA	NA	NA	NA
MW24	32.36	32.42	0.06	32.38	NA	NA	NA	NA	NA
MW25	31.36	31.46	0.10	31.39	32.38	32.52	0.14	32.42	1.03
MW26	30.95	34.82	3.87	31.94	NA	NA	NA	NA	NA
MW27	NA	30.47	0.00	30.47	NA	NA	NA	NA	NA
MW28	32.12	34.49	2.37	32.73	0.00	34.36	0.00	34.36	1.63

Cone of Depression

Reading was not collected.

Reading was determined to be an outlier and was eliminated following limited statistical analysis.

If free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 16.

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW02

Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)
11/17/14	0915	19.50	18.50	14.00	0.60	2.60	235.00	336.2	744.8
	1015	19.50	18.00	14.00	0.60	2.60	230.00	339.7	1,013
	1115	19.50	20.00	14.00	0.60	2.60	245.00	362.7	1,402
	1215	19.50	19.50	14.00	0.60	2.60	245.00	417.2	1,536
	1315	19.50	19.50	14.00	0.60	2.50	245.00	399.8	1,560
	1415	19.50	18.50	14.00	0.60	2.60	245.00	457.5	NA ¹
	1515	19.50	19.50	14.00	0.60	2.60	245.00	642.2	NA
	1615	19.50	20.50	14.00	0.60	2.60	245.00	596.2	2,816
11/18/14	0800	19.50	18.50	14.00	0.60	2.80	245.00	880.9	1,459
Average		19.50	19.17	14.00	0.60	2.61	242.22	492.5	1,504.4

Date	Time	Magnehelic Readings (inH ₂ O)														
		MW01A	MW03	MW07	MW12	MW14	MW15	MW19	MW21	MW22	MW23	MW24	MW25	MW26	MW27	MW28
11/17/14	1015	3.60	1.70	0.60	0.50	0.44	0.35	0.20	0.05	1.50	1.45	0.23	OL ²	0.57	0.03	0.50
	1115	3.45	1.70	0.57	0.55	0.42	0.35	OL	0.00	1.50	1.50	0.13	2.50	0.57	0.03	0.38
	1215	4.20	2.00	0.65	0.55	0.54	0.50	0.33	0.07	2.00	1.65	0.30	2.50	0.73	0.00	0.66
	1315	4.45	2.00	0.85	0.70	0.62	0.55	0.45	0.07	2.00	1.80	0.50	2.60	1.93	0.15	0.73
	1415	4.60	2.10	0.97	0.75	0.70	0.55	0.60	0.15	2.00	1.90	0.63	2.70	2.00	0.12	0.81
	1515	4.60	2.10	1.00	0.75	0.72	0.70	0.63	0.15	2.20	1.93	0.65	2.75	2.00	0.12	0.85
	1615	4.70	2.20	1.05	0.75	0.74	0.80	0.65	0.15	2.30	1.95	0.67	2.80	2.20	0.15	0.93
11/18/14	0800	5.40	OL	1.15	0.87	0.70	0.65	0.60	0.10	OL	2.15	0.60	OL	2.50	0.15	0.90
Average		4.38	1.97	0.86	0.68	0.61	0.56	0.49	0.09	1.93	1.79	0.46	2.64	1.56	0.09	0.72

Table 16 (Cont'd).

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW02

Well ID	November 5-6, 2014 Gauging Event				November 18, 2014 Gauging Event				Drawdown (feet)
	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
MW01A	30.70	33.49	2.79	31.41	32.42	33.17	0.75	32.61	1.20
MW02	30.80	34.10	3.30	31.65	0.00	34.90	0.00	34.90	3.25
MW03	31.52	34.52	3.00	32.29	33.37	33.89	0.52	33.50	1.21
MW04	NA	32.46	0.00	32.46	NA	NA	NA	NA	NA
MW05	NA	32.34	0.00	32.34	NA	NA	NA	NA	NA
MW06	NA	31.16	0.00	31.16	NA	NA	NA	NA	NA
MW07	NA	31.57	0.00	31.57	NA	NA	NA	NA	NA
MW08	NA	34.20	0.00	34.20	NA	NA	NA	NA	NA
MW09	NA	34.60	0.00	34.60	NA	NA	NA	NA	NA
MW10	NA	35.10	0.00	35.10	NA	NA	NA	NA	NA
MW11	NA	35.20	0.00	35.20	NA	NA	NA	NA	NA
MW12	31.79	32.05	0.26	31.86	NA	NA	NA	NA	NA
MW13	NA	32.22	0.00	32.22	NA	NA	NA	NA	NA
MW14	32.00	34.66	2.66	32.68	32.61	35.74	3.13	33.41	0.73
MW15	32.90	35.33	2.43	33.52	NA	NA	NA	NA	NA
MW16	NA	33.75	0.00	33.75	NA	NA	NA	NA	NA
MW17	NA	32.12	0.00	32.12	NA	NA	NA	NA	NA
MW18	NA	34.43	0.00	34.43	NA	NA	NA	NA	NA
MW19	33.46	33.87	0.41	33.57	NA	NA	NA	NA	NA
MW20	NA	35.66	0.00	35.66	NA	NA	NA	NA	NA
MW21	33.39	35.96	2.57	34.05	NA	NA	NA	NA	NA
MW22	31.59	33.83	2.24	32.16	0.00	33.48	0.00	33.48	1.32
MW23	30.74	32.38	1.64	31.16	NA	NA	NA	NA	NA
MW24	32.36	32.42	0.06	32.38	33.01	33.66	0.65	33.18	0.80
MW25	31.36	31.46	0.10	31.39	32.39	33.48	1.09	32.67	1.28
MW26	30.95	34.82	3.87	31.94	0.00	32.92	0.00	32.92	0.98
MW27	NA	30.47	0.00	30.47	NA	NA	NA	NA	NA
MW28	32.12	34.49	2.37	32.73	NA	NA	NA	NA	NA

Cone of Depression

Reading was not collected.

Reading was determined to be an outlier and was eliminated following limited statistical analysis.

³If free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 17.

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW14

Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)
11/18/14	0945	19.50	19.50	14.50	0.65	2.60	245.00	393.3	1,456
	1045	19.50	18.50	15.00	0.70	2.50	240.00	1,081	1,387
	1145	19.50	18.50	15.00	0.60	2.40	235.00	1,155	1,463
	1245	20.00	19.00	15.00	0.60	2.50	235.00	1,159	1,419
	1345	20.00	20.50	15.00	0.65	2.30	245.00	1,145	1,120
	1445	19.50	19.50	15.00	0.65	2.50	250.00	1,068	1,223
	1545	20.00	18.00	15.00	0.55	2.50	240.00	1,153	1,117
	1645	20.00	17.50	15.00	0.60	2.50	220.00	1,145	1,158
11/19/14	0800	20.00	19.50	15.00	0.60	2.50	230.00	1,165	NA ¹
Average		19.78	18.94	14.94	0.62	2.48	237.78	1,051.6	1,292.0

Date	Time	Magnehelic Readings (inH ₂ O)															
		MW01A	MW02	MW03	MW07	MW12	MW15	MW19	MW21	MW22	MW23	MW24	MW25	MW26	MW27	MW28	
11/18/14	1045	0.50	0.73	4.30	0.35	0.15	2.15	0.30	0.20	0.30	0.20	0.87	0.30	2.90	0.00	0.30	
	1145	0.40	0.70	4.30	0.25	0.12	2.15	0.25	0.20	0.30	0.20	OL ²	0.25	3.00	0.02	0.20	
	1245	0.45	0.75	4.30	0.33	0.15	2.20	0.25	0.23	0.30	0.20	0.85	0.25	3.00	0.03	0.20	
	1345	0.45	0.75	4.30	0.27	0.15	2.35	0.30	0.23	0.30	OL	0.83	0.30	2.50	0.03	0.22	
	1445	0.50	0.80	4.30	0.33	0.20	2.45	0.40	0.25	0.40	0.20	0.93	0.40	3.00	0.05	0.34	
	1545	NA	NA	4.30	0.40	0.20	2.50	0.43	0.25	0.45	0.20	0.93	0.40	3.00	0.05	0.34	
	1645	0.55	0.87	4.30	OL	0.20	2.50	0.45	0.25	0.45	0.20	0.93	0.40	3.00	0.05	0.34	
11/19/14	0800	0.50	0.89	OL	0.35	0.17	2.55	0.37	0.23	0.50	0.20	0.87	0.40	2.50	0.00	0.28	
Average		0.48	0.78	4.30	0.33	0.17	2.36	0.34	0.23	0.38	0.20	0.89	0.34	2.86	0.03	0.28	

Table 17 (Cont'd).

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW14

Well ID	November 5-6, 2014 Gauging Event				November 19, 2014 Gauging Event				Drawdown (feet)
	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
MW01A	30.70	33.49	2.79	31.41	NA	NA	NA	NA	NA
MW02	30.80	34.10	3.30	31.65	0.00	32.63	0.00	32.63	0.98
MW03	31.52	34.52	3.00	32.29	33.96	34.39	0.43	34.07	1.78
MW04	NA	32.46	0.00	32.46	NA	NA	NA	NA	NA
MW05	NA	32.34	0.00	32.34	NA	NA	NA	NA	NA
MW06	NA	31.16	0.00	31.16	NA	NA	NA	NA	NA
MW07	NA	31.57	0.00	31.57	NA	NA	NA	NA	NA
MW08	NA	34.20	0.00	34.20	NA	NA	NA	NA	NA
MW09	NA	34.60	0.00	34.60	NA	NA	NA	NA	NA
MW10	NA	35.10	0.00	35.10	NA	NA	NA	NA	NA
MW11	NA	35.20	0.00	35.20	NA	NA	NA	NA	NA
MW12	31.79	32.05	0.26	31.86	NA	NA	NA	NA	NA
MW13	NA	32.22	0.00	32.22	NA	NA	NA	NA	NA
MW14	32.00	34.66	2.66	32.68	35.54	35.67	0.13	35.57	2.89
MW15	32.90	35.33	2.43	33.52	34.09	36.62	2.53	34.74	1.22
MW16	NA	33.75	0.00	33.75	NA	NA	NA	NA	NA
MW17	NA	32.12	0.00	32.12	NA	NA	NA	NA	NA
MW18	NA	34.43	0.00	34.43	NA	NA	NA	NA	NA
MW19	33.46	33.87	0.41	33.57	NA	NA	NA	NA	NA
MW20	NA	35.66	0.00	35.66	NA	NA	NA	NA	NA
MW21	33.39	35.96	2.57	34.05	NA	NA	NA	NA	NA
MW22	31.59	33.83	2.24	32.16	0.00	33.00	0.00	33.00	0.84
MW23	30.74	32.38	1.64	31.16	NA	NA	NA	NA	NA
MW24	32.36	32.42	0.06	32.38	NA	NA	NA	NA	NA
MW25	31.36	31.46	0.10	31.39	32.14	32.21	0.07	32.16	0.77
MW26	30.95	34.82	3.87	31.94	0.00	33.49	0.00	33.49	1.55
MW27	NA	30.47	0.00	30.47	NA	NA	NA	NA	NA
MW28	32.12	34.49	2.37	32.73	33.55	33.78	0.23	33.61	0.88

Cone of Depression

Reading was not collected.

Reading was determined to be an outlier and was eliminated following limited statistical analysis.

Free phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 18.

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW23

Date	Time	Vapor/Liquid Phase Separator Vacuum (inHg)	Manifold Vacuum (inHg)	Wellhead Vacuum (inHg)	RCP Inlet Pitot Tube (inH ₂ O)	RCP Exhaust Pitot Tube (inH ₂ O)	RCP Exhaust Temperature (°F)	RCP Exhaust PID Readings (ppm)	Air Stripper Exhaust PID Readings (ppm)
11/19/14	0930	19.50	20.00	17.50	0.60	2.70	235.00	939.2	1,152
	1030	22.00	24.50	17.50	0.50	2.50	230.00	752.4	925.8
	1130	23.00	24.00	17.50	0.10	2.50	220.00	305.8	NA ¹
	1230	19.50	19.50	17.00	0.65	2.60	235.00	780.8	731.6
	1330	19.50	20.00	16.00	0.65	2.50	235.00	783.3	NA
	1430	20.00	21.00	15.00	0.65	2.60	255.00	577.2	684.9
	1530	19.50	19.50	15.50	0.65	2.60	245.00	578.3	NA
	1630	19.50	17.50	15.50	0.65	2.60	235.00	802.3	648.4
11/20/14	0800	19.50	19.50	16.00	0.60	2.60	250.00	854.5	NA
Average		20.22	20.61	16.39	0.56	2.58	237.78	708.2	828.5

Date	Time	Magnehelic Readings (inH ₂ O)														
		MW01A	MW02	MW03	MW07	MW12	MW14	MW15	MW19	MW21	MW22	MW24	MW25	MW26	MW27	MW28
11/19/14	1030	OL ²	OL	0.15	OL	5.30	0.10	0.03	0.00	0.00	OL	0.35	0.65	0.23	OL	0.11
	1130	OL	2.25	0.15	2.20	5.50	0.03	0.03	0.00	0.00	0.03	0.32	0.65	0.25	1.00	0.06
	1230	12.00	2.25	0.15	2.20	5.40	0.03	0.03	0.00	0.00	0.03	0.30	0.65	0.25	1.00	0.06
	1330	OL	OL	0.15	2.30	5.30	0.03	OL	0.00	0.00	0.03	0.27	0.65	0.24	OL	0.05
	1430	12.00	2.25	0.15	2.30	5.30	0.10	OL	0.00	0.00	0.03	0.30	0.65	0.28	1.00	0.12
	1530	12.00	2.25	0.17	2.30	5.30	0.12	0.03	0.00	0.00	0.03	0.35	OL	0.28	1.00	0.12
	1630	12.00	2.25	0.17	2.30	5.30	0.12	OL	0.00	0.00	0.03	0.37	OL	0.30	1.00	0.12
11/20/14	0830	OL	OL	0.15	OL	5.50	0.17	OL	OL	0.00	0.03	0.37	OL	OL	OL	0.16
Average		12.00	2.25	0.16	2.27	5.36	0.09	0.03	0.00	0.00	0.03	0.33	0.65	0.26	1.00	0.10

Table 18 (Cont'd).

A Summary of the Individual Well Pilot Study Event – Monitoring Well MW23

Well ID	November 5-6, 2014 Gauging Event				November 20, 2014 Gauging Event				Drawdown (feet)
	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Revised Depth to Water ³ (feet)	
MW01A	30.70	33.49	2.79	31.41	31.41	33.63	2.22	31.98	0.57
MW02	30.80	34.10	3.30	31.65	31.97	34.34	2.37	32.58	0.93
MW03	31.52	34.52	3.00	32.29	NA	NA	NA	NA	NA
MW04	NA	32.46	0.00	32.46	NA	NA	NA	NA	NA
MW05	NA	32.34	0.00	32.34	0.00	32.96	0.00	32.96	0.62
MW06	NA	31.16	0.00	31.16	0.00	31.80	0.00	31.80	0.64
MW07	NA	31.57	0.00	31.57	0.00	32.51	0.00	32.51	0.94
MW08	NA	34.20	0.00	34.20	NA	NA	NA	NA	NA
MW09	NA	34.60	0.00	34.60	NA	NA	NA	NA	NA
MW10	NA	35.10	0.00	35.10	NA	NA	NA	NA	NA
MW11	NA	35.20	0.00	35.20	NA	NA	NA	NA	NA
MW12	31.79	32.05	0.26	31.86	0.00	32.42	0.00	32.42	0.56
MW13	NA	32.22	0.00	32.22	0.00	32.86	0.00	32.86	0.64
MW14	32.00	34.66	2.66	32.68	NA	NA	NA	NA	NA
MW15	32.90	35.33	2.43	33.52	NA	NA	NA	NA	NA
MW16	NA	33.75	0.00	33.75	NA	NA	NA	NA	NA
MW17	NA	32.12	0.00	32.12	NA	NA	NA	NA	NA
MW18	NA	34.43	0.00	34.43	NA	NA	NA	NA	NA
MW19	33.46	33.87	0.41	33.57	NA	NA	NA	NA	NA
MW20	NA	35.66	0.00	35.66	NA	NA	NA	NA	NA
MW21	33.39	35.96	2.57	34.05	NA	NA	NA	NA	NA
MW22	31.59	33.83	2.24	32.16	NA	NA	NA	NA	NA
MW23	30.74	32.38	1.64	31.16	0.00	34.80	0.00	34.80	3.64
MW24	32.36	32.42	0.06	32.38	NA	NA	NA	NA	NA
MW25	31.36	31.46	0.10	31.39	NA	NA	NA	NA	NA
MW26	30.95	34.82	3.87	31.94	NA	NA	NA	NA	NA
MW27	NA	30.47	0.00	30.47	0.00	31.22	0.00	31.22	0.75
MW28	32.12	34.49	2.37	32.73	NA	NA	NA	NA	NA

Cone of Depression

¹ = Reading was not collected.

² Reading was determined to be an outlier and was eliminated following limited statistical analysis.

³ Where phase petroleum was observed, actual water column was calculated using a site specific gasoline density of 0.7439 g/ml.

Table 19.
A Summary of the Individual Well Hydrocarbon Recovery Estimates

VAPOR PHASE MASS RECOVERY ESTIMATES (pounds)							
Extraction Well Identification	Exhaust Volume (ft³)	Benzene¹	Toluene	Ethylbenzene	Xylenes	MTBE	TVPH
MW21	44,850	4.96	46.10	5.68	21.01	NA ²	449.51
MW03	160,425	2.40	41.40	9.72	44.60	NA	334.29
MW28	227,700	1.89	21.88	4.66	20.54	NA	221.97
MW26	242,550	1.55	16.19	3.62	17.75	0.86	160.92
MW22	237,600	2.76	23.20	3.82	16.04	NA	229.49
MW02	240,075	4.96	47.30	6.55	28.21	1.87	449.87
MW14	232,650	1.59	22.92	5.00	23.67	NA	199.79
MW23	237,600	1.66	14.33	2.30	10.29	0.92	142.07
Total	1,623,450	21.77	233.32	41.35	182.11	3.65	2,187.91

¹BTEX/MTBE/TVPH analysis via U.S. EPA method 18; reported in mg/M³.

²NA = Not applicable.

Table 20.

A Summary of the Multiple Well Pilot Study Event

Extraction Wells	System Runtime (Hours)	Average System Vacuum ("Hg)	Average Inlet Differential Pressure ("H ₂ O)	Average Exhaust Differential Pressure ("H ₂ O)	Average System Temperature (°F)	Average RCP PID Reading (ppm)	Estimated Volume of Liquids Recovered (Gallons)
MW01A MW02 MW03 MW14 MW22 ¹ MW24 MW25 MW26	142	14.41	1.17	7.38	230	1,006.64	19,828

¹MW22 was utilized as an extraction well for approximately three hours only and was disconnected due to the significant volume of water being recovered.

Table 21.
A Summary of the Multiple Well Drawdown Data

Well Identification	Maximum Observed Drawdown (feet)
MW01A	3.34
MW02	3.74
MW03	2.73
MW04	1.56
MW05	1.72
MW06	1.66
MW07	3.50
MW08	1.01
MW09	1.02
MW10	0.72
MW11	1.06
MW12	1.59
MW13	1.44
MW14	3.17
MW15	1.95
MW16	0.90
MW17	0.89
MW18	1.22
MW19	1.99
MW20	0.94
MW21	2.38
MW22	2.42
MW23	2.35
MW24	1.88
MW25	3.41
MW26	2.97
MW27	1.62
MW28	2.46

Table 22.
A Summary of the Multiple Well Radius of Influence Data

Well Identification	Magnehelic Readings – Average (inH₂O)	Magnehelic Readings – Highest (inH₂O)
MW01A	151.94	176.67
MW02	159.68	183.47
MW03	177.03	197.06
MW04	3.33	3.80
MW05	1.46	2.00
MW06	0.11	0.17
MW07	5.97	7.50
MW08	0.08	0.20
MW09	0.05	0.10
MW10	NA ¹	NA
MW11	0.18	0.33
MW12	3.75	4.10
MW13	0.96	1.12
MW14	155.70	169.88
MW15	4.68	5.30
MW16	0.00	0.00
MW17	NA	NA
MW18	0.70	1.00
MW19	2.09	2.50
MW20	0.03	0.10
MW21	2.78	3.10
MW22	NA	NA
MW23	6.57	8.10
MW24	162.20	169.88
MW25	141.75	163.08
MW26	157.04	176.67
MW27	0.33	0.45
MW28	3.15	5.20

¹NA = Reading was not collected.

Table 23.

A Summary of the Multiple Well Pilot Study Vapor Phase Analytical Results

Sample Identification	Date	Approximate Runtime ¹ (Hours)	TVPH ²	Benzene ³	Toluene	Ethyl-benzene	Total Xylenes	MTBE
RCP ⁴ -1	11/20/14	4.75	29,700	326	3,360	576	2,679	143
AS ⁵ -1			2,660	29.7	467	142	786	53.0
RCP-2	11/21/14	15.25	18,800	194	2,060	356	1,588	104
AS-2			1,910	19.9	357	111	579	43.6
RCP-3	11/21/14	8	16,300	187	1,820	295	1,347	ND ⁶
AS-3			1,390	14.8	265	85.0	481	38.8
RCP-4	11/22/14	18.5	17,700	192	1,970	321	1,453	ND
AS-4			734	ND	135	45.0	276.1	33.0
RCP-5	11/23/14	27.5	8,380	103	962	144	628	ND
AS-5			915	12.5	162	48.5	295.6	37.2
RCP-6	11/24/14	26	8,940	ND	1,080	181	812	ND
AS-6			488	10.1	146	34.8	211	29.2
RCP-7	11/25/14	24	10,800	105	1,140	187	790	ND
AS-7			703	11.9	170	39.6	210.8	33.2
RCP-8	11/26/14	18	9,360	92.2	967	145	636	ND
AS-8			599	10.9	154	33.4	189.5	30.9

¹Approximate DPE system runtime between vapor sample sets.

²TVPH (total volatile petroleum hydrocarbons) analysis via U.S. EPA SW-846 method 18; reported in milligrams per cubic meters (mg/m³).

³BTEX, MTBE, naphthalene analysis via U.S. EPA SW-846 method 18; reported in mg/m³.

⁴RCP = Vapor sample collected from the rotary claw pump exhaust stream.

⁵AS = Vapor sample collected from the air stripper exhaust stream.

⁶ND = Non detected at laboratory method detection limit.

Table 24.

A Summary of the Multiple Well Pilot Study Dissolved Phase Analytical Results

Sample ID	Date	TPH-GRO ¹	TPH-DRO ²	Benzene ³	Toluene	Ethyl-benzene	Xylenes	MTBE	Naphthalene
INF ⁴ -1	11/20/14	193,000	47,700	3,130	33,300	6,860	34,100	12,900	1,140
EFF ⁵ -1		7,150	27,000	24.9	320	195	852	934	637
INF-2	11/21/14	174,000	76,900	1,850	24,500	5,750	31,700	9,260	1,440
EFF-2		5,130	18,000	8.85	183	73.6	463	493	441
INF-3	11/21/14	164,000	43,800	1,570	21,600	5,470	30,600	8,600	1,570
EFF-3		5,280	19,900	9.15	162	78.4	492	377	567
INF-4	11/22/14	152,000	79,100	1,400	17,500	4,720	27,600	7,660	2,240
EFF-4		4,560	18,400	8.99	137	63.0	408	334	515
INF-5	11/23/14	120,000	187,000	1,250	14,800	3,450	20,400	7,500	2,300
EFF-5		3,120	17,700	4.05	89.9	22.5	232	267	558
INF-6	11/24/14	107,000	71,600	1,150	13,200	2,980	18,100	6,720	2,360
EFF-6		2,330	18,800	2.99	47.3	20.2	145	185	262
INF-7	11/25/14	94,700	50,100	1,040	12,200	2,840	16,900	6,120	2,340
EFF-7		1,860	16,500	3.08	44.0	18.4	132	180	240
INF-8	11/26/14	88,700	50,300	992	11,800	2,710	15,900	5,840	2,080
EFF-8		7,280	47,600	3.68	85.5	99.4	588	158	632

¹TPH (gasoline range organics) analysis via U.S. EPA SW-846 method 8015B; reported in micrograms per liter (µg/L).

²TPH (diesel range organics) analysis via U.S. EPA SW-846 method 8015B; reported in µg/L.

³BTEX, MTBE, naphthalene analysis via U.S. EPA SW-846 method 8021B; reported in µg/L.

⁴INF = Influent samples collected from the piping transferring water from the oil/water separator to the air stripper.

⁵EFF = Effluent samples collected from the piping transferring water from the air stripper to the storage tanker.

Table 25.
A Summary of the Multiple Well Hydrocarbon Recovery Estimates

VAPOR PHASE MASS RECOVERY ESTIMATES (pounds)							
Extraction Wells	Exhaust Volume (ft³)	Benzene¹	Toluene	Ethylbenzene	Xylenes	MTBE	TVPH
MW01A MW02 MW03 MW14 MW22 ² MW24 MW25 MW26	2,249,280	24.76	241.31	39.83	179.43	17.85	2,167.29
DISSOLVED PHASE MASS RECOVERY ESTIMATES (pounds)							
Extraction Wells	Gallons Recovered	Benzene³	Toluene	Ethylbenzene	Xylenes	MTBE	TPH-GRO⁴
MW01A MW02 MW03 MW14 MW22 ² MW24 MW25 MW26	19,828	0.26	3.08	0.72	4.04	1.34	19.38
Total		25.02	244.39	40.55	183.47	19.19	2,186.67

¹BTEX/MTBE/TVPH analysis via U.S. EPA method 18; reported in mg/M³.

²MW22 was utilized as an extraction well for approximately three hours only and was disconnected due to the significant volume of water being recovered.

³BTEX/MTBE analysis via U.S. EPA method 8021B; reported in µg/L.

⁴TPH-GRO analysis via U.S. EPA method 8015B; reported in µg/L.

Table 26.
A Summary of the ¼-Mile Radius Receptor Survey Results

Receptor ID	Name/Address ¹	Well/Spring Location From UST System	Potential Receptor Information, Current Use, Installation Date, & Construction Details
DW01	Meadows of Dan Food Market 2609 Jeb Stuart Highway	~75 feet Northwest	Property maintains a drilled supply well with steel casing located within the store building. The date of installation and additional construction details are unknown.
DW02	Poor Farmer's Market 2616 Jeb Stuart Highway	~135 feet South	Property maintains a drilled supply well with steel casing located within the store building. The well was reportedly installed in 1962. Additional construction details are unknown. A residence is also located on the property, which obtains potable water from the same onsite supply well. Carbon filtrations units have been installed as part of the VA DEQ alternate water supply program.
DW03	Jane's County Café 2588 Jeb Stuart Highway	~255 feet Southwest	Property maintains a drilled supply well with steel casing located within a well house behind the café. The date of installation and additional construction details are unknown. Carbon filtrations units have been installed as part of the VA DEQ alternate water supply program.
DW04	Commercial Property 2554 Jeb Stuart Highway	~375 feet Southwest	A drilled supply well is located beneath the wooden porch at the DW04 property. The drilled supply well reportedly provides potable water to the properties identified as DW04, DW05, and DW06. The date of installation and additional construction details are unknown. During this phase of investigation the power to DW04 was disconnected and attempts to contact the property owner have been unsuccessful.
DW05	Commercial Property (For Sale) Formerly Dan River Books 36 Concord Road		
DW06	Commercial Property (Seasonal) 10 Concord Road		
DW07	Mountain Meadow Farm & Craft (seasonal) 12134 Squirrel Spur Road	~1,210 feet Southwest	A spring/spring house is located on the DW08 property. The spring reportedly provides potable water to both the DW07 and DW08 properties.
DW08	Greenberry House Yarn 12206 Squirrel Spur Road	~730 feet Southwest	
DW09	Burnette Residence 282 Concord Road	~1,300 feet Southeast	Property maintains a spring/spring house that reportedly provides potable water to the property.
DW10	Meadows of Dan Community Center 2858 Jeb Stuart Highway	~1,350 feet East-Southeast	Property maintains a drilled supply well located within the Meadows of Dan Community Center building. The date of installation and construction details are unknown.
DW11	Agee Residence 2882 Jeb Stuart Highway	~1,415 feet East-Northeast	Property maintains a drilled supply well with PVC casing located on the east side of the residence. The date of installation and additional construction details are unknown.

Table 26 (Cont'd).

A Summary of the ¼-Mile Radius Receptor Survey Results

Receptor ID	Name/Address ¹	Well/Spring Location From UST System	Potential Receptor Information, Current Use, Installation Date, & Construction Details
DW12	Spangler Residence 2734 Jeb Stuart Highway	~630 feet East-Southeast	Property reportedly maintains a drilled supply well located on the south side of the residence. The supply well casing is reportedly buried and its exact location is unknown. The date of installation and additional construction details are unknown. Carbon filtrations units have been installed as part of the VA DEQ alternate water supply program.
DW13	Stanley Residence 2727 Jeb Stuart Highway	~550 feet East-Northeast	Property maintains a drilled supply well with steel casing located on the south side of the residence. The supply well is reportedly 340 feet deep; however, the date of installation and additional construction details are unknown.
DW14	<i>Sandra Buckley 910 262-7770</i> Private Residence 2685 Jeb Stuart Highway <i>P.O. Box 937, M. of Dan 24120</i>	~325 feet East	Property maintains a drilled supply well with PVC casing located on the south side of the residence. The supply well was reportedly installed in ~2008-2009. Additional construction details are unknown.
DW15	Nancy's Candy Company 2684 Jeb Stuart Highway	~470 feet Southeast	Property maintains a drilled supply well with steel casing located on the south side of the building. The supply well was installed in 1998 to approximately 405 feet below the ground surface. In addition, 105 feet of steel casing was installed and the well was grouted from 0-50 feet. Carbon filtrations units have been installed as part of the VA DEQ alternate water supply program.
DW16	Commercial Property Former Mountain House Restaurant 2639 Jeb Stuart Highway	~175 feet East	Property maintains a drilled supply well with steel casing located within a well house on the east side of the property. The supply well was reportedly installed in 1982 to approximately 280 feet below the ground surface. Additional construction details are unknown.
DW17	Commercial Building (Multiple Businesses) 2577 Jeb Stuart Highway Meadows Merchant Building LLC	~200 feet Northwest	Property maintains a drilled supply well with steel casing located on the north side of the property. The top of casing is located below the ground within larger concrete casing. The date of installation and additional construction details are unknown.
DW18	Meadows of Dan Baptist Church 2511 Jeb Stuart Highway	~400 feet Northwest	Property maintains a drilled supply well with steel casing located within the parsonage. The date of installation and additional construction details are unknown.
DW19	Century Link Property 2646 Jeb Stuart Highway	~190 feet Southeast	Property maintains a drilled supply well located on the north side of the property. The top of casing is located below the ground within a manway. The date of installation and additional construction details are unknown.
DW20	Pond	~1,130 feet Southwest	The pond is located on the DW07 property and drains to an intermittent tributary to Tuggle Creek.
DW21	Unnamed Tributary	~950 feet East	Unnamed intermittent tributary to Tuggle Creek.
DW22	Unnamed Tributary	~1,030 feet Southwest	Unnamed intermittent tributary to Tuggle Creek.

¹Addresses are located in Meadows of Dan, VA 24120

APPENDIX B

Maps

Site Map (11/05/14)
Aerial Map
Topographic Map
Soil Boring Location Map
Monitoring Well Location Map
Potentiometric Surface Map (11/05/14)
TPH-GRO Isoconcentration Map (11/05/14)
Benzene Isoconcentration Map (11/05/14)
Toluene Isoconcentration Map (11/05/14)
Ethylbenzene Isoconcentration Map (11/05/14)
Xylenes Isoconcentration Map (11/05/14)
MTBE Isoconcentration Map (11/05/14)
Naphthalene Isoconcentration Map (11/05/14)
Total BTEX Isoconcentration Map (11/05/14)
Free Phase Petroleum Plume Map (11/05/14)
Free Phase Petroleum Plume Map – Maximum Observed Thickness
Remediation System Groundwork Map
Individual Well Radius of Influence Maps
Individual Well Drawdown Maps
Multiple Well Radius of Influence Map
Multiple Well Drawdown Map
Potential Receptors Location Map (11/05/14)

Aerial Map

Meadows of Dan Food Market
2609 Jeb Stuart Highway
Meadows of Dan, Virginia 24120



GREENE
ENVIRONMENTAL SERVICES LLC

200 Buckwheat Lane, Rocky Mount, Virginia 24151

Office: 540-483-3311 or 800-215-2596

Fax: 540-483-3381

www.greene-environmental.com

**PATRICK COUNTY,
VIRGINIA**

Source: Google Earth

Scale: Not to Scale

Project: IA CAP IMP

Client: T&M, M of D, L.L.C.

Greene Job #: FMMD1004

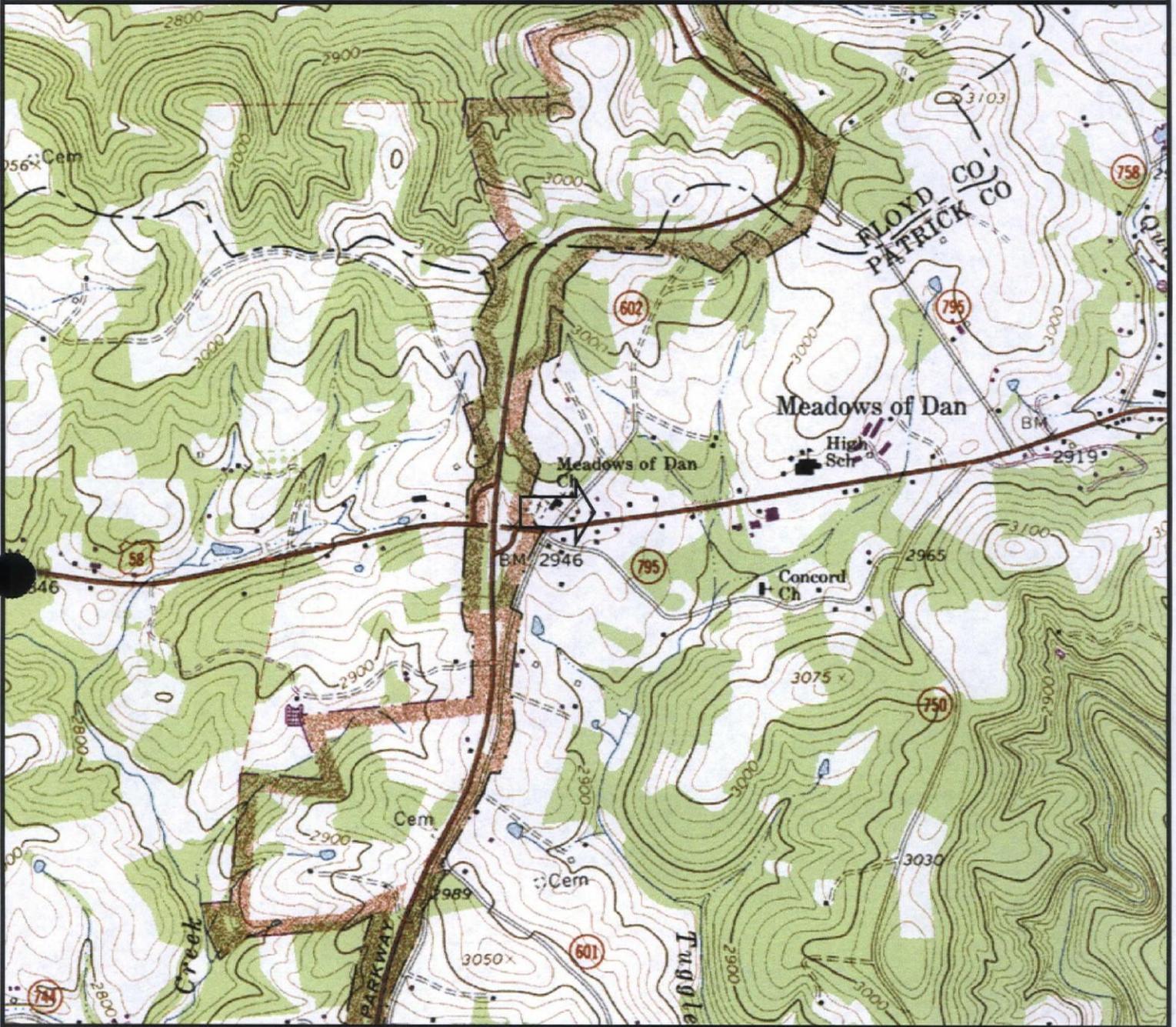
Date: February 2, 2015



Latitude:
036.7353972° N
Longitude:
080.4077838° W

Topographic Map

Meadows of Dan Food Market
2609 Jeb Stuart Highway
Meadows of Dan, Virginia 24120



GREENE

ENVIRONMENTAL SERVICES LLC

200 Buckwheat Lane, Rocky Mount, Virginia 24151

Office: 540-483-3311 or 800-215-2596

Fax: 540-483-3381

www.greene-environmental.com

MEADOWS of DAN, VIRGINIA

Source: U.S.G.S. Topographic Map of the Meadows of Dan Quadrangle, Virginia, 7.5 Minute Series (1968, revised 1985)

Scale: Not to Scale Contour Interval: 20 Feet

Vertical Datum: National Geodetic Vertical Datum 1929

Horizontal Datum: North American Datum 1927

Project: IA CAP IMP

Client: T&M, M of D, L.L.C.

Greene Job #: FMMD1004

Date: February 2, 2015

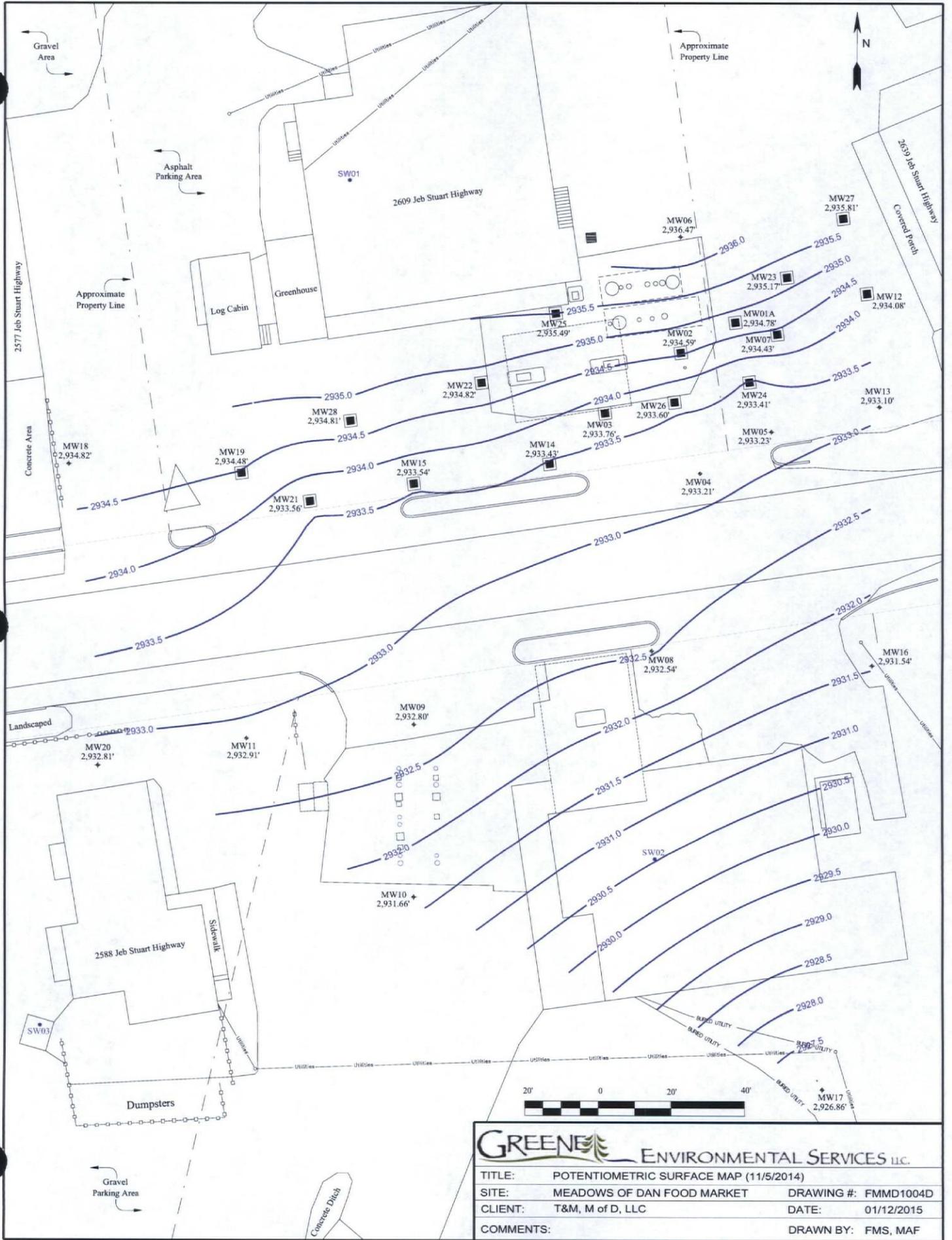


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Longitude: 080.4077838° W



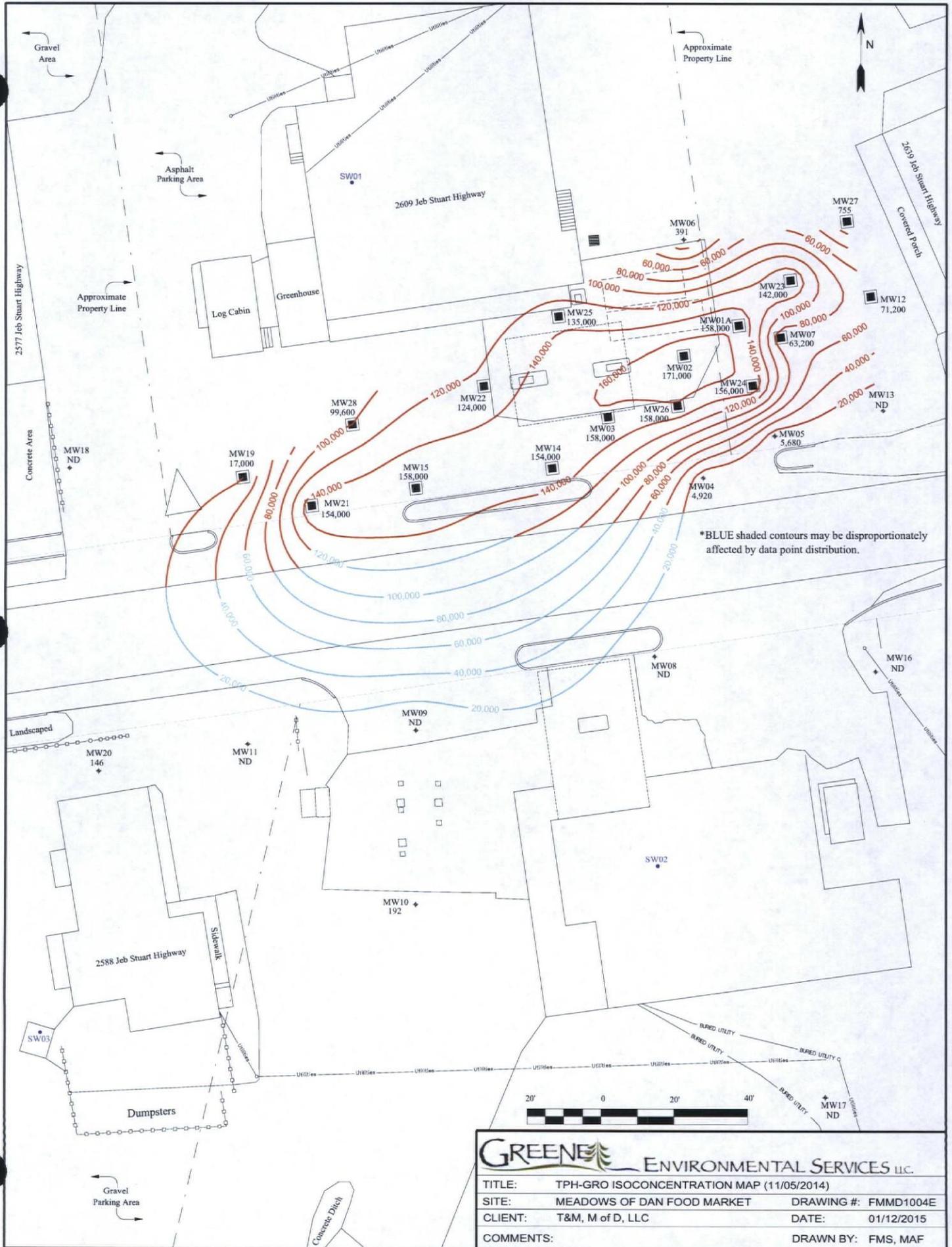


TITLE: MONITORING WELL LOCATION MAP	
SITE: MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004C
CLIENT: T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:	DRAWN BY: FMS, MAF

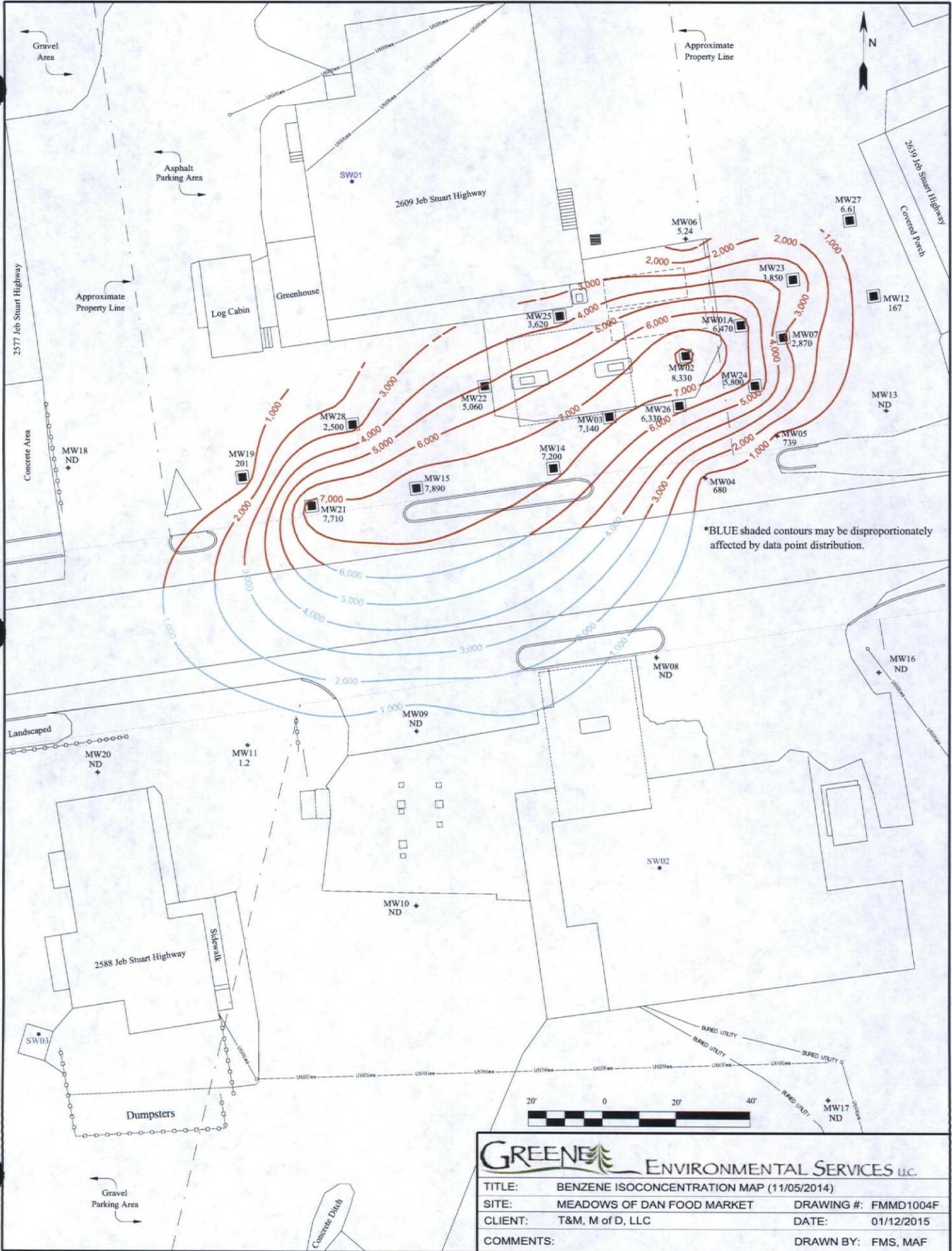


GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	POTENTIOMETRIC SURFACE MAP (11/5/2014)	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004D
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



TITLE:	TPH-GRO ISOCONCENTRATION MAP (11/05/2014)	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004E
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



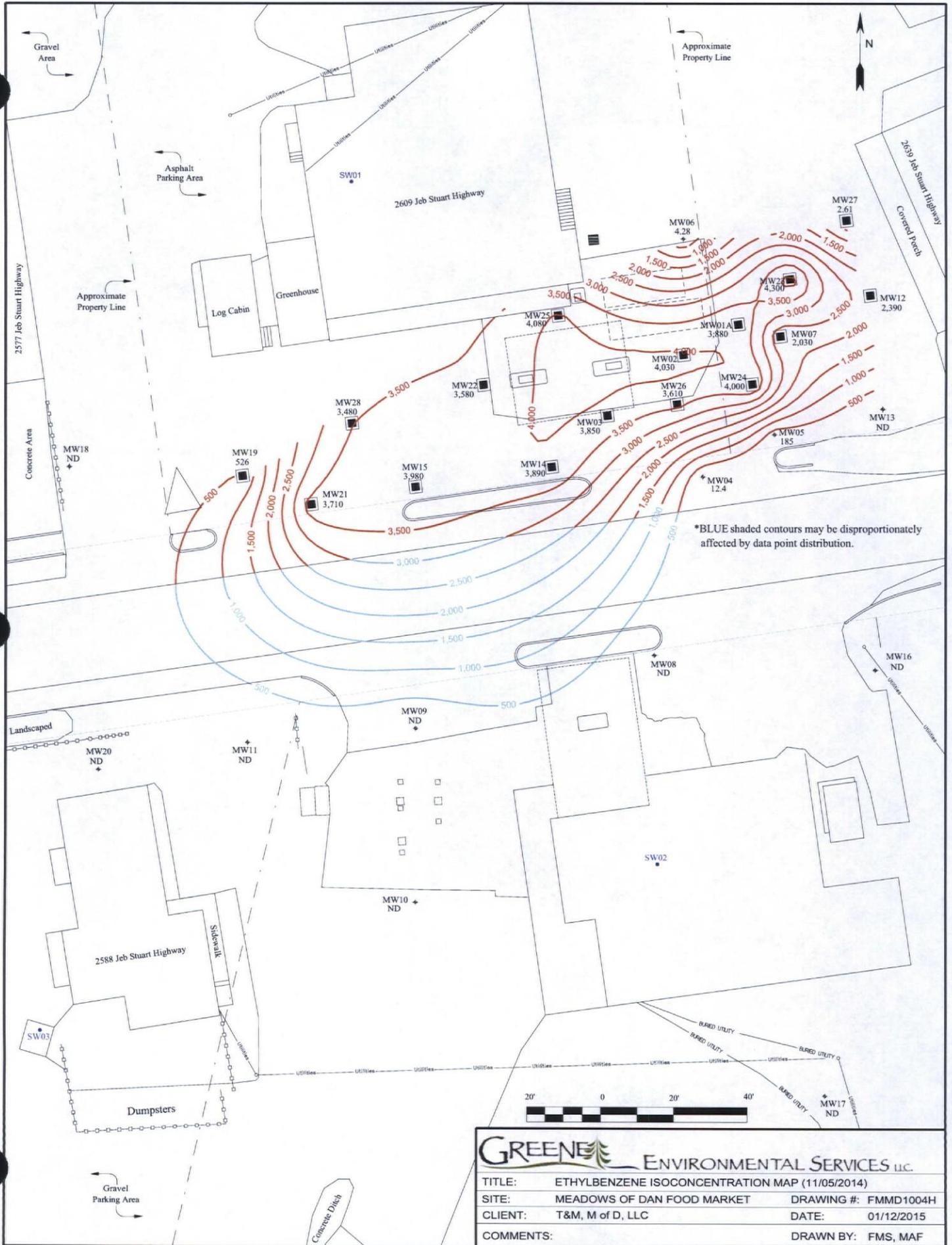
*BLUE shaded contours may be disproportionately affected by data point distribution.



TITLE:	BENZENE ISOCONCENTRATION MAP (11/05/2014)	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004F
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.	
TITLE:	TOLUENE ISOCONCENTRATION MAP (11/05/2014)
SITE:	MEADOWS OF DAN FOOD MARKET
CLIENT:	T&M, M of D, LLC
COMMENTS:	
DRAWING #:	FMMD1004G
DATE:	01/12/2015
DRAWN BY:	FMS, MAF



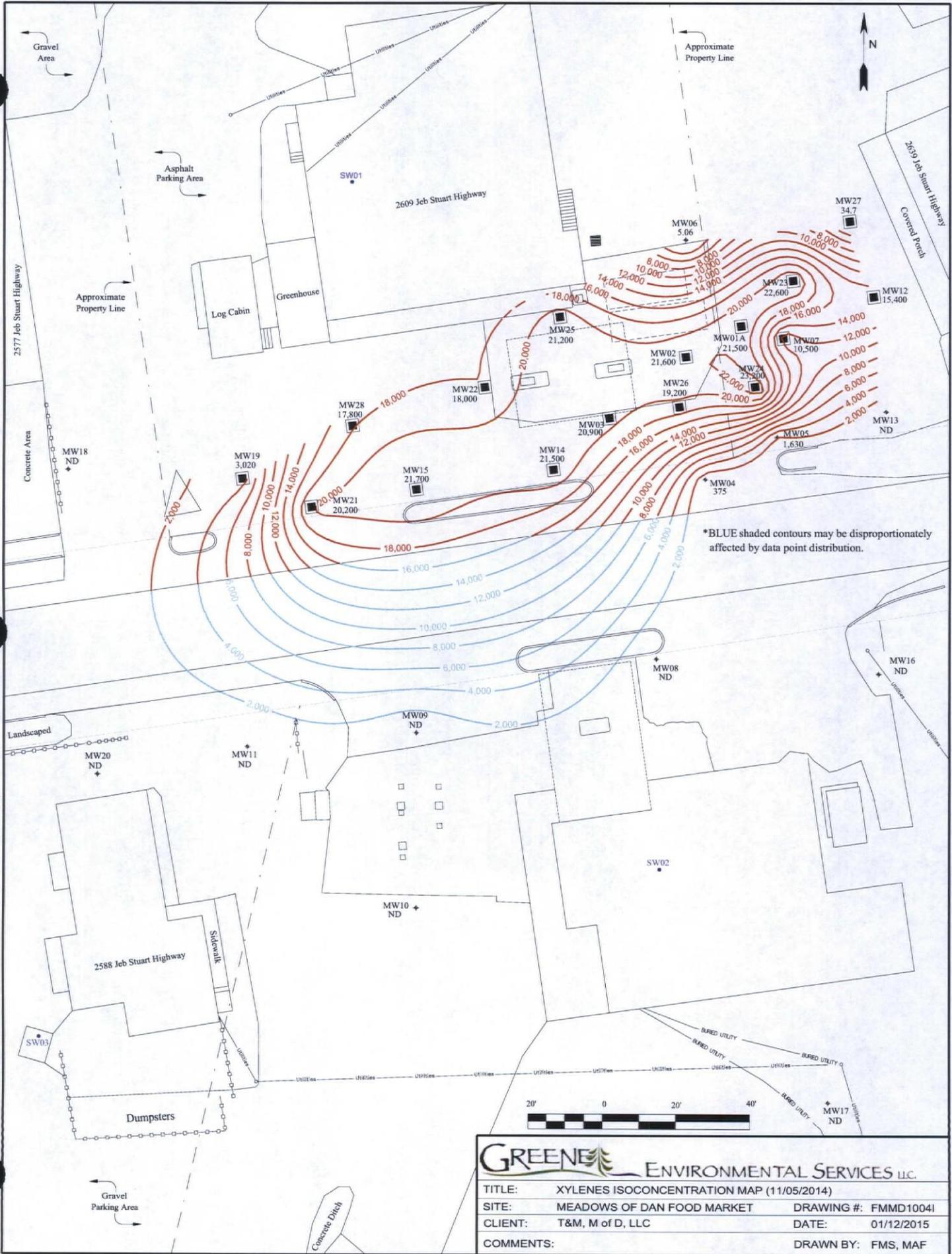
GREENE ENVIRONMENTAL SERVICES LLC.

TITLE: ETHYLBENZENE ISOCONCENTRATION MAP (11/05/2014)

SITE: MEADOWS OF DAN FOOD MARKET DRAWING #: FMMD1004H

CLIENT: T&M, M of D, LLC DATE: 01/12/2015

COMMENTS: DRAWN BY: FMS, MAF



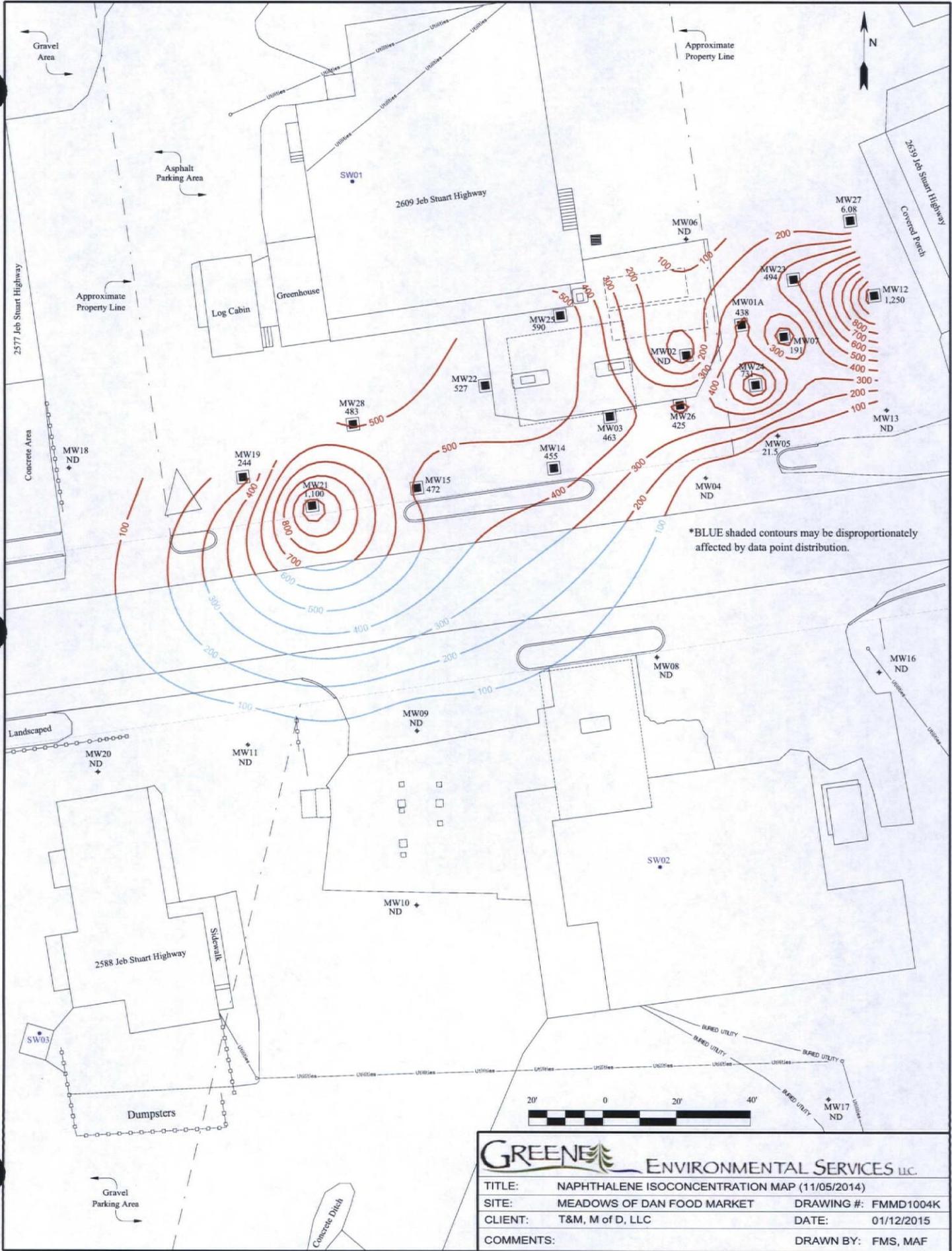
TITLE:	XYLENES ISOCONCENTRATION MAP (11/05/2014)	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004I
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



*BLUE shaded contours may be disproportionately affected by data point distribution.



TITLE:	MTBE ISOCONCENTRATION MAP (11/05/2014)	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004J
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	NAPHTHALENE ISOCONCENTRATION MAP (11/05/2014)	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004K
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF

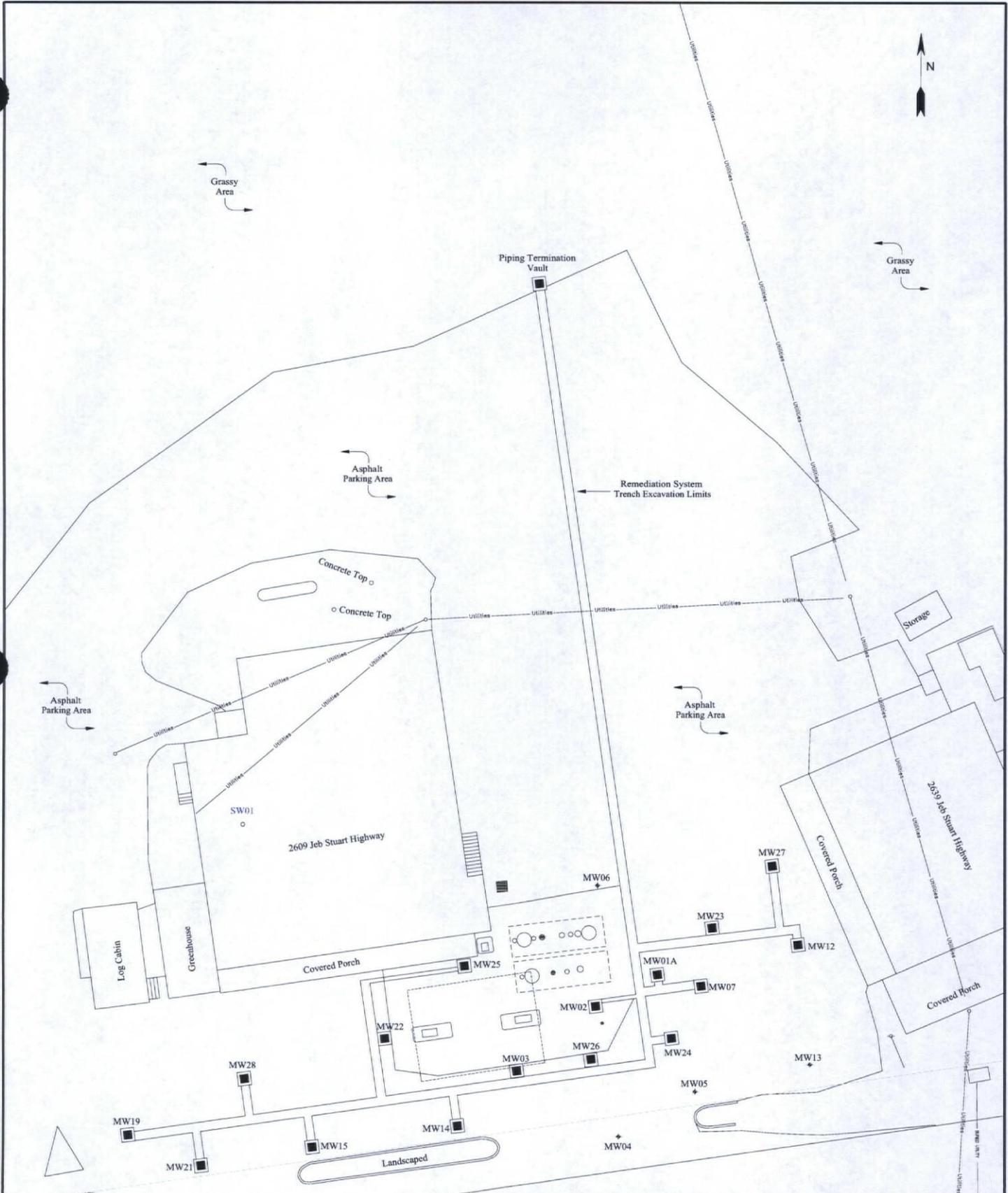


*BLUE shaded contours may be disproportionately affected by data point distribution.

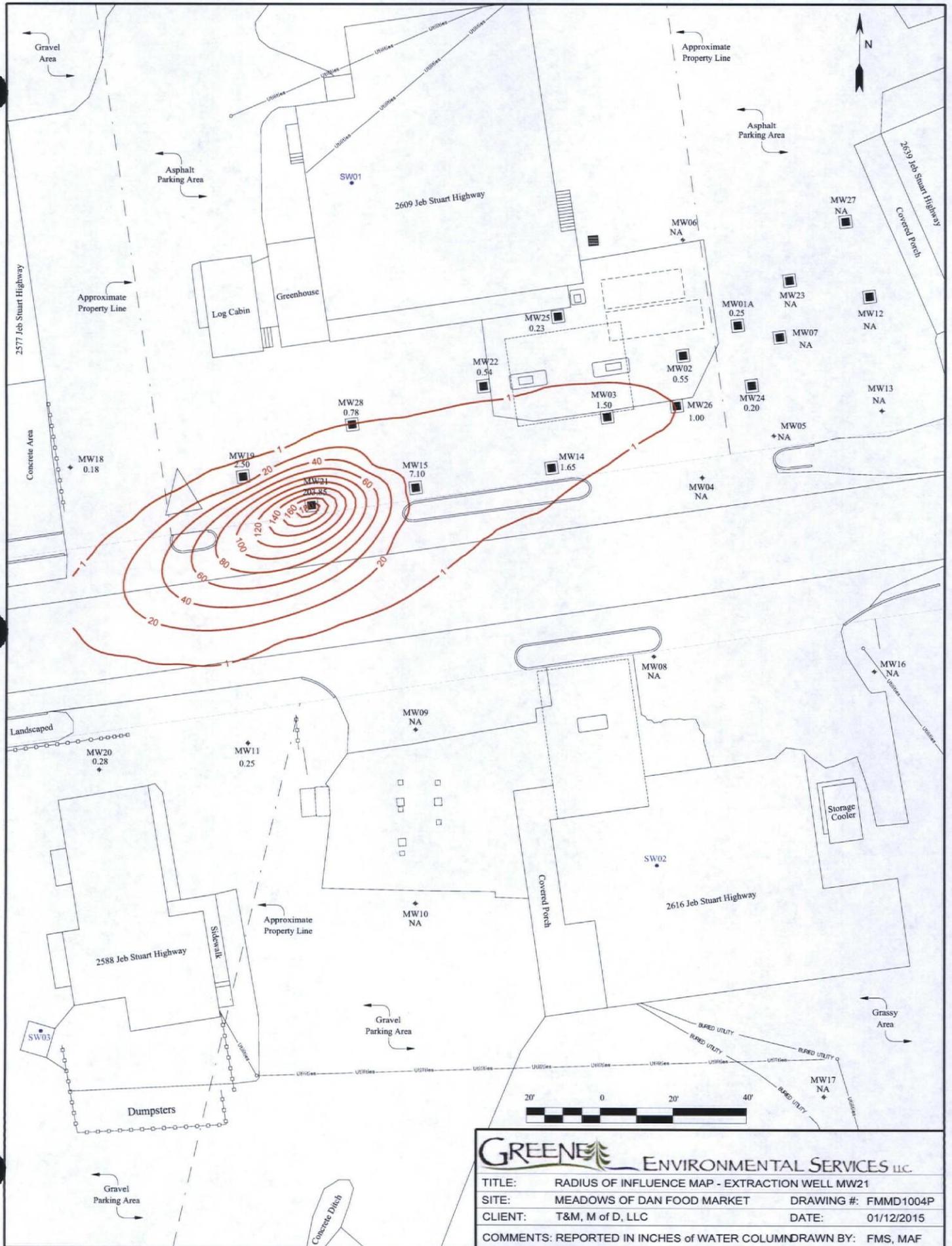
GREENE ENVIRONMENTAL SERVICES LLC.	
TITLE:	TOTAL BTEX ISOCONCENTRATION MAP (11/05/2014)
SITE:	MEADOWS OF DAN FOOD MARKET
CLIENT:	T&M, M of D, LLC
COMMENTS:	
DRAWING #:	FMMD1004L
DATE:	01/12/2015
DRAWN BY:	FMS, MAF



TITLE:	FREE PHASE PETROLEUM PLUME MAP (11/05/2014)
SITE:	MEADOWS OF DAN FOOD MARKET
CLIENT:	T&M, M of D, LLC
COMMENTS:	
DRAWING #:	FMMD1004M
DATE:	01/12/2015
DRAWN BY:	FMS, MAF



TITLE:	REMEDATION SYSTEM GROUNDWORK MAP	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD10040
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW21		
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #:	FMMD1004P
CLIENT:	T&M, M of D, LLC	DATE:	01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN	DRAWN BY:	FMS, MAF

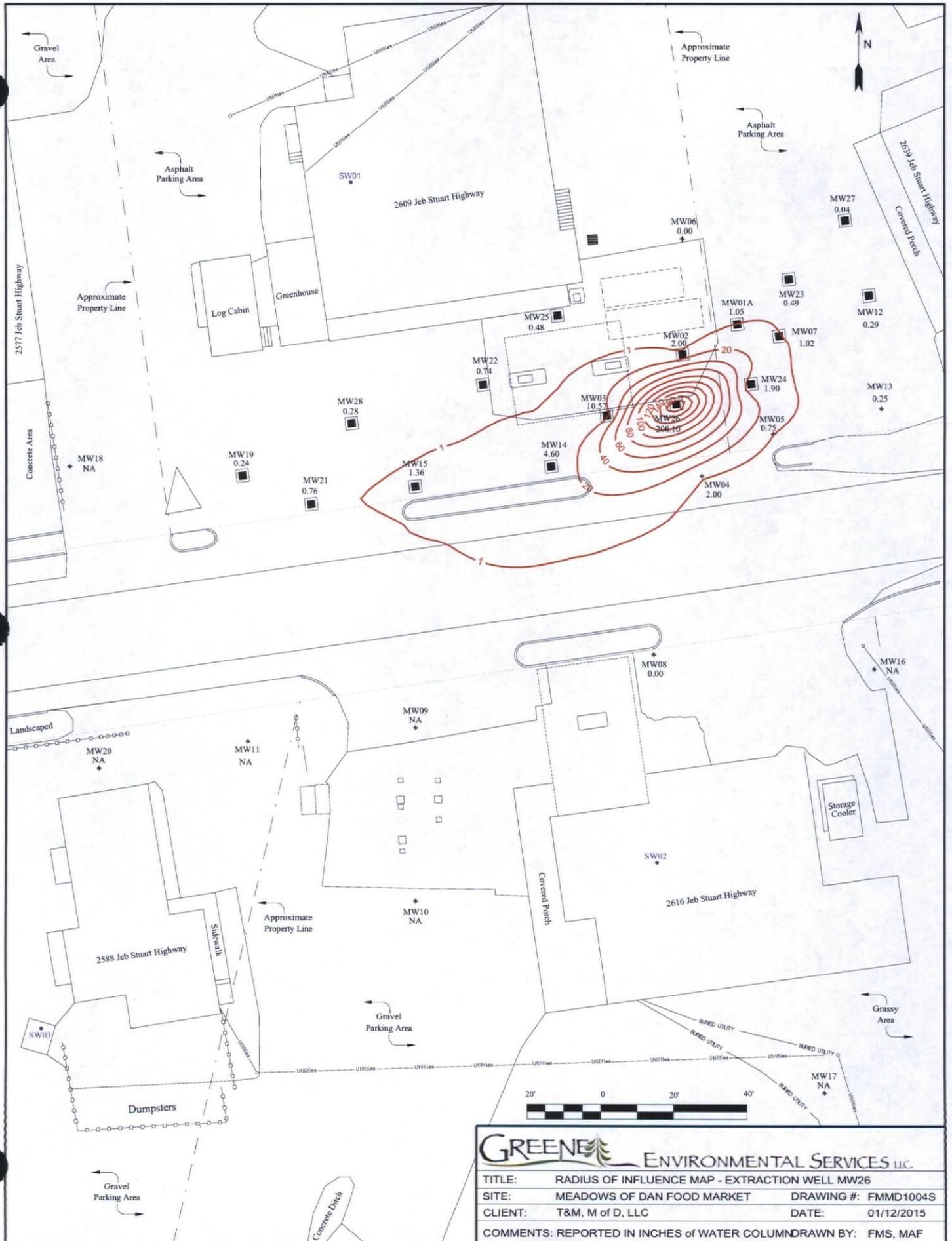


GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW03	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004Q
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN DRAWN BY: FMS, MAF	

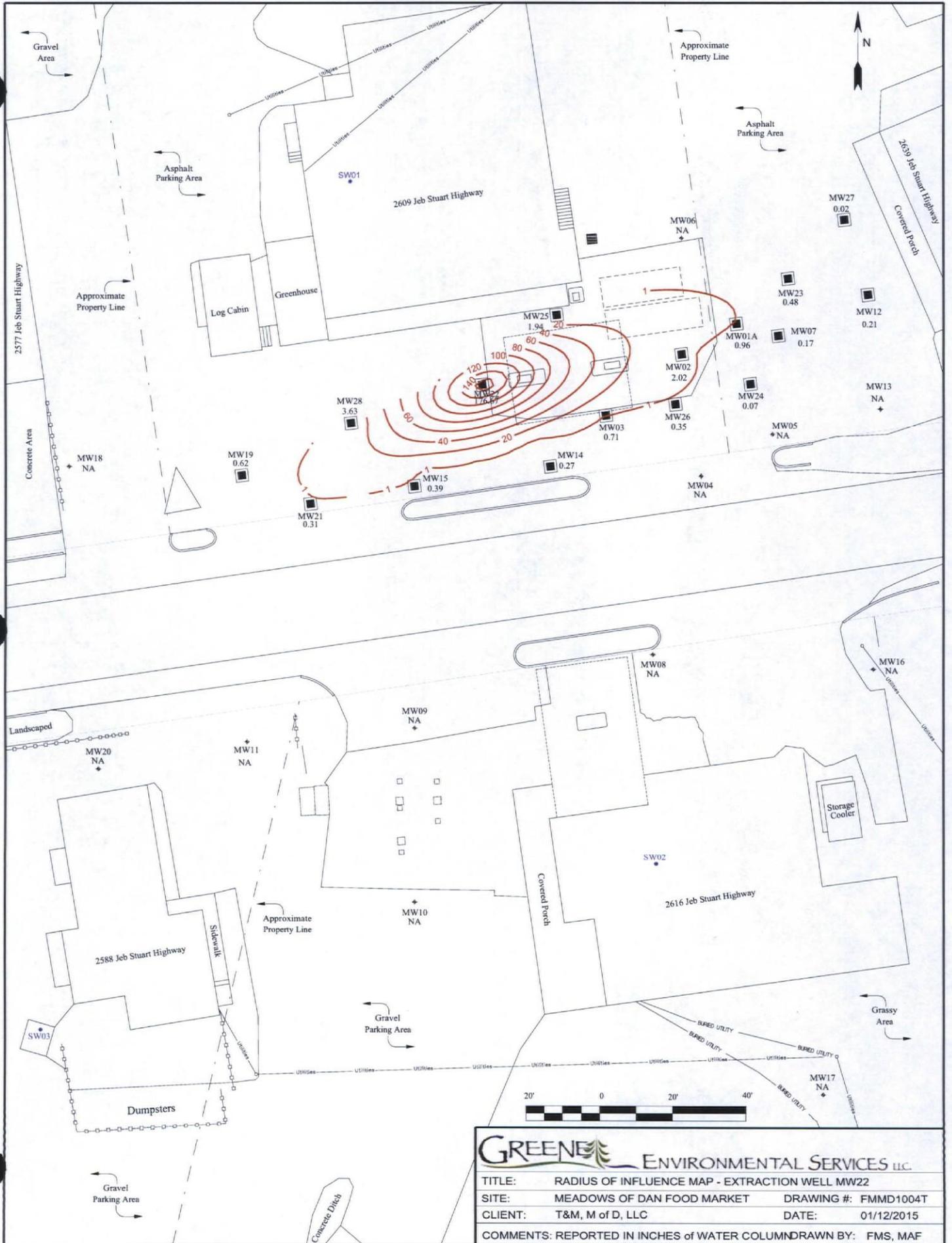


TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW28
SITE:	MEADOWS OF DAN FOOD MARKET DRAWING #: FMMD1004R
CLIENT:	T&M, M of D, LLC DATE: 01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN DRAWN BY: FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW26	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004S
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN DRAWN BY: FMS, MAF	



GREENE ENVIRONMENTAL SERVICES LLC.	
TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW22
SITE:	MEADOWS OF DAN FOOD MARKET DRAWING #: FMMD1004T
CLIENT:	T&M, M of D, LLC DATE: 01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN DRAWN BY: FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW02		
SITE:	Meadows of Dan Food Market	DRAWING #:	FMMD1004U
CLIENT:	T&M, M of D, LLC	DATE:	01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN DRAWN BY: FMS, MAF		



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW14		
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #:	FMMD1004V
CLIENT:	T&M, M of D, LLC	DATE:	01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN DRAWN BY: FMS, MAF		

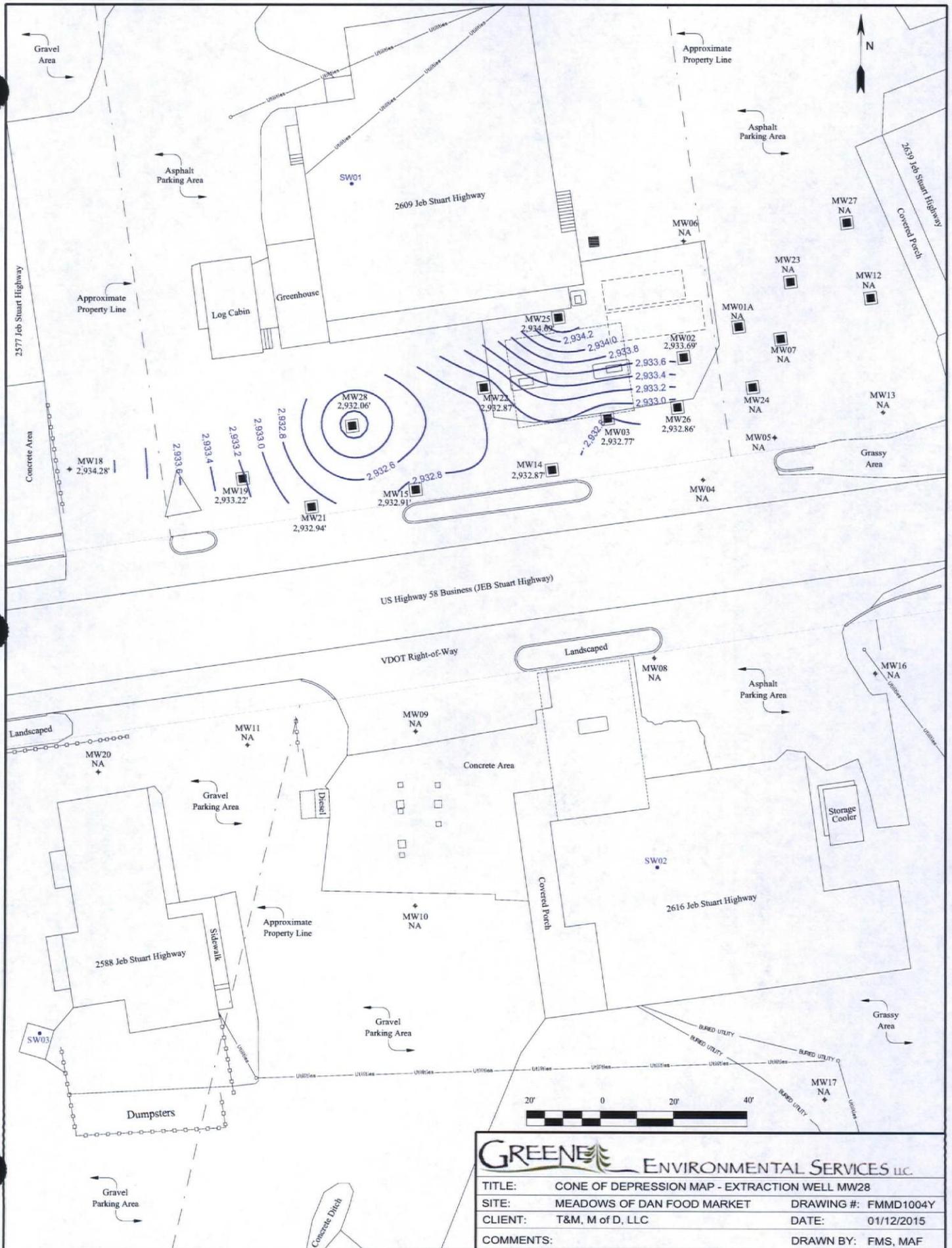


GREENE ENVIRONMENTAL SERVICES LLC.	
TITLE:	RADIUS OF INFLUENCE MAP - EXTRACTION WELL MW23
SITE:	MEADOWS OF DAN FOOD MARKET
CLIENT:	T&M, M of D, LLC
DRAWING #:	FMMD1004W
DATE:	01/12/2015
COMMENTS:	REPORTED IN INCHES of WATER COLUMN
DRAWN BY:	FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	CONE OF DEPRESSION MAP - EXTRACTION WELL MW03	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004X
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



TITLE: CONE OF DEPRESSION MAP - EXTRACTION WELL MW28		
SITE: MEADOWS OF DAN FOOD MARKET		DRAWING #: FMMD1004Y
CLIENT: T&M, M of D, LLC		DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE:	CONE OF DEPRESSION MAP - EXTRACTION WELL MW26		
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #:	FMMD1004Z
CLIENT:	T&M, M of D, LLC	DATE:	01/12/2015
COMMENTS:		DRAWN BY:	FMS, MAF



TITLE:	CONE OF DEPRESSION MAP - EXTRACTION WELL MW22	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004AA
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



TITLE:	CONE OF DEPRESSION MAP - EXTRACTION WELL MW02	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004BB
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



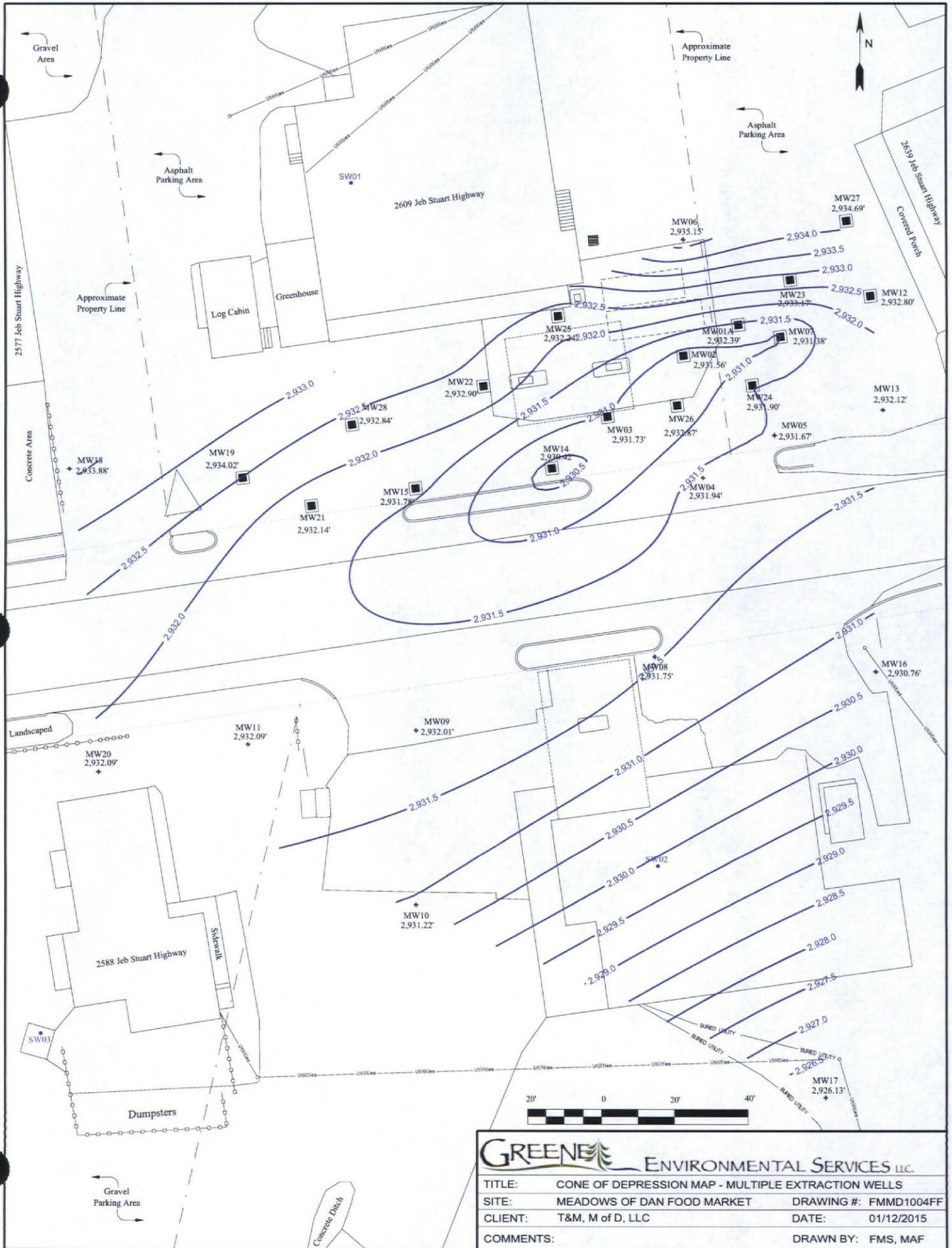
TITLE:	CONE OF DEPRESSION MAP - EXTRACTION WELL MW14	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004CC
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



TITLE:	CONE OF DEPRESSION MAP - EXTRACTION WELL MW23	
SITE:	MEADOWS OF DAN FOOD MARKET	DRAWING #: FMMD1004DD
CLIENT:	T&M, M of D, LLC	DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.	
TITLE:	RADIUS OF INFLUENCE MAP - MULTIPLE EXTRACTION WELLS
SITE:	MEADOWS OF DAN FOOD MARKET
CLIENT:	T&M, M of D, LLC
DRAWING #:	FMMD1004EE
DATE:	01/12/2015
COMMENTS:	AVERAGE INCHES OF WATER COLUMN
DRAWN BY:	FMS, MAF



GREENE ENVIRONMENTAL SERVICES LLC.

TITLE: CONE OF DEPRESSION MAP - MULTIPLE EXTRACTION WELLS		
SITE: MEADOWS OF DAN FOOD MARKET		DRAWING #: FMMD1004FF
CLIENT: T&M, M of D, LLC		DATE: 01/12/2015
COMMENTS:		DRAWN BY: FMS, MAF

Potential Receptors Location Map

Meadows of Dan Food Market
 2609 Jeb Stuart Highway
 Meadows of Dan, Virginia 24120



ENVIRONMENTAL SERVICES LLC
 200 Buckwheat Lane, Rocky Mount, Virginia 24151

Office: 540-483-3311 or 800-215-2596
 Fax: 540-483-3381

www.greene-environmental.com

PATRICK COUNTY, VIRGINIA

Source: Google Earth

Scale: Not to Scale

Project: IA CAP IMP

Client: T&M, M of D, L.L.C.

Greene Job #: FMMD1004

Date: February 2, 2015



Latitude:
 036.7353972° N
 Longitude:
 080.4077838° W

APPENDIX C

Geologic Information

Soil Boring Logs/Monitoring Well Construction Diagrams

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B20

Diagram of Monitoring Well: MW20

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			
							50	100	150	Well Completion Details
0.0		Ground Surface	0.0							
0.5		GRAVEL	0.5							
0.5 - 5.0		B20-1 (0.5'-5') Fine- to medium-grained; reddish brown to brown; slightly micaceous silty fine sand with clay component; no petroleum odor	5.0	B20-1		NA / NA	0.0			
5.0 - 10.0		B20-2 (5'-10') Fine- to medium-grained; reddish brown to brown; silty clay to micaceous silty fine sand with weathered mica structure; no petroleum odor	10.0	B20-2		NA / NA	0.0			
10.0 - 15.0		B20-3 (10'-15') Fine- to medium-grained; reddish brown to tan; micaceous silty fine sand with mica flakes; no petroleum odor	15.0	B20-3		NA / NA	0.0			
15.0 - 20.0		B20-4 (15'-20') Fine- to medium-grained; mottled brown to tan to grayish brown; micaceous silty fine sand with weathered mica structure; saprolitic; no petroleum odor	20.0	B20-4		ND / ND	0.0			
20.0 - 25.0		B20-5 (20'-25') Fine- to medium-grained; mottled brown to tan to grayish brown; micaceous silty fine sand with weathered mica structure; saprolitic; no petroleum odor	25.0	B20-5		ND / ND	0.1			

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14

Hole Size: 6.875 INCHES

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ENVIRONMENTAL SERVICES LLC.
200 Buckwheat Lane
Rocky Mount, VA 24151

Sheet: 1 of 2

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B20

Diagram of Monitoring Well: MW20

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE			SAMPLE			PID READINGS		MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm 50 100 150	
26		B20-6 (25'-30') Fine- to medium-grained; tan with black seams; weathered micaceous silty fine sand; saprolitic; no petroleum odor; evidence of potential moisture					0.1	<p>#3 Silica Sand (DTW) - 35.66' - (11/06/14) 2" Slotted Screen</p>
27			30.0	B20-6		ND / ND	0.0	
28		B20-7 (30'-35') Fine- to medium-grained; tan to grayish brown; micaceous silty fine sand with mica flakes throughout; evidence of groundwater; slight petroleum odor; larger rock fragments evident					1.9	
29			35.0	B20-7		ND / ND		
30		No additional samples collected. Converted from direct push to hollow-stem auger drilling techniques. Soil boring B20 converted to MW20 approximately 45' bgs.						
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45		End of Borehole	45.0					
46								
47								
48								
49								

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER
 Drilled by: DAVIDSON DRILLING, INC.
 Drill Date: 07/31/14
 Hole Size: 6.875 INCHES



Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B21

Diagram of Monitoring Well: MW21

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							1250	2500	3750	
0		Ground Surface	0.0							
0.5	ASPHALT		0.5							
1		B21-1 (0.5'-5') Fine- to medium-grained; reddish brown to brown to tan; micaceous silty fine sand with clay component; no petroleum odor; larger mica flakes evident		B21-1		NA / NA	8.2			
5.0		B21-2 (5'-10') Fine- to medium-grained; brown to tan with black and dark brown seams; micaceous silty fine sand; larger rock fragments and mica flakes evident; slight petroleum odor		B21-2		NA / NA	0.5			
10.0		B21-3 (10'-15') Fine- to medium-grained; brown to orangish brown to tan with black seams; micaceous silty fine sand with small rock fragments evident; very slight petroleum odor		B21-3		NA / NA	0.0			
15.0		B21-4 (15'-20') Fine- to medium-grained; tan with black mottled seams; micaceous silty fine sand with small to large rock fragments evident; mica flakes evident; very slight petroleum odor		B21-4		ND / ND	0.5			
20.0		B21-5 (20'-25') Fine- to medium-grained; tan to grayish brown; micaceous silty fine sand with small to large rock fragments evident; mica flakes evident; slight petroleum odor		B21-5		ND / ND	38.9			
25.0			25.0				4,672			

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14

Hole Size: 6.875 INCHES



Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B21

Diagram of Monitoring Well: MW21

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE				SAMPLE		PID READINGS			MONITORING WELL DIAGRAM	
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							1250	2500	3750	
26		B21-6 (25'-30') Fine- to medium-grained; tan to grayish brown; micaceous silty fine sand; saprolitic structure with quartz evident; petroleum odor					38.9			<p>#3 Silica Sand (DTP) - 33.39' - (11/05/14) (DTW) - 35.96' - (11/05/14) 2" Slotted Screen</p>
27				B21-6		ND / ND	68.2			
28			30.0							
29										
30		B21-7 (30'-35') Fine- to medium-grained; tan to grayish brown; micaceous silty fine sand with larger quartz fragments; strong petroleum odor evident; potential groundwater observed								
31				B21-7		38.4 / 1,420			4,672	
32										
33										
34										
35		No additional samples collected. Converted from direct push to hollow-stem auger drilling techniques. Soil boring B21 converted to MW21 approximately 45' bgs.	35.0							
36										
37										
38										
39										
40										
41										
42										
43										
44										
45		End of Borehole	45.0							
46										
47										
48										
49										

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14

Hole Size: 6.875 INCHES

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ENVIRONMENTAL SERVICES LLC.
200 Buckwheat Lane
Rocky Mount, VA 24151

Sheet: 2 of 2

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B22

Diagram of Monitoring Well: MW22

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM	
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details	
							50	100	150		
0		Ground Surface	0.0								
0.5		ASPHALT	0.5								
1		B22-1 (0.5'-5') Fine- to medium-grained; light brown to orangish brown; silty clay to micaceous silty fine sand; smaller rock fragments evident; no petroleum odor		B22-1		6.97 / NA	0.0				
5.0		B22-2 (5'-10') Fine- to medium-grained; brown to light brown; silty clay with sand to micaceous silty clay with mica flakes throughout; slight petroleum odor		B21-2		ND / ND	0.1				
10.0		B22-3 (10'-15') Fine- to medium-grained; light brown to tan; micaceous silty clay to micaceous silty fine sand; slight petroleum odor		B22-3		ND / ND	2.5				
15.0		B22-4 (15'-20') Fine- to medium-grained; light brown to tan; micaceous silty clay to micaceous silty fine sand; slight petroleum odor		B22-4		ND / ND	9.2				
20.0		B22-5 (20'-25') Fine- to medium-grained; light brown to tan; micaceous silty clay with mica flakes throughout; slight petroleum odor		B22-5		ND / ND	2.7				
25.0			25.0				105.9				

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES



Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B22

Diagram of Monitoring Well: MW22

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS		MONITORING WELL DIAGRAM	
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							50	100	150	
26.0		<p>B22-6 (25'-26') Observed rod refusal approximately 26 feet bgs Converted from direct push to hollow-stem auger drilling techniques. Fine- to medium-grained; light brown to tan; micaceous silty clay with mica flakes throughout; slight petroleum odor</p>	26.0	B22-6	ND / ND	ND / ND	2.7	4.2		
26.0 - 30.0		<p>B22-7 (26'-30') Fine- to medium-grained; light brown; micaceous silty fine sand with trace clay; strong petroleum odor</p>	30.0	B22-7	ND / ND	ND / ND	105.9			
30.0 - 45.0		No additional samples collected. Soil boring B22 converted to MW22 approximately 45' bgs.	45.0							
45.0		End of Borehole	45.0							

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

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200 Buckwheat Lane
Rocky Mount, VA 24151

Sheet: 2 of 2

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B23

Diagram of Monitoring Well: MW23

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							1000	2000	3000	
0.0		Ground Surface	0.0							
0.5		ASPHALT	0.5							
1.0		B23-1 (0.5'-5') Fine grained; reddish brown with black seams; micaceous silty sandy clay; no petroleum odor		B23-1		NA / NA	1.9			
5.0		B23-2 (5'-10') Fine to medium grained; reddish to dark brown; micaceous silty sand with minor clay component; contained larger quartz and mica fragments; slight petroleum odor		B23-2		NA / NA	3.6			
10.0		B23-3 (10'-15') Fine to medium grained; reddish to dark brown with black seams; micaceous silty sandy clay; contained small to large quartz fragments; slight petroleum odor		B23-3		NA / NA	14.7			
15.0		B23-4 (15'-20') Fine to medium grained; dark to reddish brown with black seams; micaceous silty sand; larger mica and quartz fragments throughout; slight petroleum odor		B23-4		ND / .294	92.4			
20.0		B23-5 (20'-25') Fine to medium grained; dark brown to white to orangish brown; micaceous silty sand; weathered mica and quartz fragments evident		B23-5		ND / 1.68	120.9			
25.0			25.0				2.739			

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

GREENE
ENVIRONMENTAL SERVICES LLC.
200 Buckwheat Lane
Rocky Mount, VA 24151

Sheet: 1 of 2

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B23

Diagram of Monitoring Well: MW23

Geologist: ADAM FLORA

Generation Date: 01/13/15

SUBSURFACE PROFILE				SAMPLE		PID READINGS	MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	Well Completion Details
						1000 2000 3000	
						120.9 2.739	
26		B23-6 (25'-29') Fine to medium grained; dark to grayish brown; micaceous silty sand; strong petroleum odor					
27		Observed rod refusal approximatley 29 feet bgs Converted from direct push to hollow-stem auger drilling techniques.		B23-6			
28							
29			29.0				
29		No additional samples collected. Soil boring B23 converted to MW23 approximately 45' bgs.					
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45			45.0				
45		End of Borehole					
46							
47							
48							
49							

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES



Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B24

Diagram of Monitoring Well: MW24

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							12.5	25	37.5	
0		Ground Surface	0.0							
0.5	ASPHALT		0.5							
1		B24-1 (0.5'-5') Fine grained; dark to reddish brown; fatty micaceous silty sandy clay; saprolitic; no petroleum odor		B24-1		NA / NA	0.0			
2										
3										
4										
5			5.0							
6		B24-2 (5'-10') Fine to medium grained; reddish to dark brown; weathered micaceous sand; saprolitic; larger mica fragments evident; no petroleum odor		B24-2		NA / NA	0.0			
7										
8										
9										
10			10.0							
11		B24-3 (10'-15') Fine to medium grained; reddish to dark brown; weathered micaceous sand; saprolitic; larger mica and quartz fragments evident; no petroleum odor		B24-3		NA / NA	0.0			
12										
13										
14										
15			15.0							
16		B24-4 (15'-20') Fine to medium grained; light to reddish/orangish brown; micaceous silty sand with minor clay component; larger quartz fragments; saprolitic structure; slight petroleum odor		B24-4		ND / .294	9.8			
17										
18										
19										
20			20.0							
21		B24-5 (20'-25') Fine grained; dark to tannish brown with black seams; micaceous silty sand; slight petroleum odor		B24-5		ND / 1.68	8.2			
22										
23										
24										
25			25.0				0.1			

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER
 Drilled by: DAVIDSON DRILLING, INC.
 Drill Date: 07/31/14 & 08/01/14
 Hole Size: 6.875 INCHES

GREENE
 ENVIRONMENTAL SERVICES LLC
 200 Buckwheat Lane
 Rocky Mount, VA 24151

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B24

Diagram of Monitoring Well: MW24

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							12.5	25	37.5	
26		B24-6 (25'-30') Fine to medium grained; reddish to light brown with black seams; micaceous silty sand; slight petroleum odor					8.2			
27				B24-6		86.1 / 677	2.7			
28										
29										
30			30.0							
31		B24-7 (30'-32') No sample collected								
32		Observed rod refusal approximately 32 feet bgs Converted from direct push to hollow-stem auger drilling techniques.	32.0	B24-7						
33		B24-8 (32'-35') Fine grained; dark brown; micaceous silty sand with minor clay component; moisture evident; slight petroleum odor.								
34				B24-8		NA / NA	0.1			
35		No additional samples collected. Soil boring B24 converted to MW24 approximately 45' bgs	35.0							
36										
37										
38										
39										
40										
41										
42										
43										
44										
45		End of Borehole	45.0							
46										
47										
48										
49										
50										

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER
 Drilled by: DAVIDSON DRILLING, INC.
 Drill Date: 07/31/14 & 08/01/14
 Hole Size: 6.875 INCHES

GREENE
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 Rocky Mount, VA 24151

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B25

Diagram of Monitoring Well: MW25

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM	
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details	
							500	1000	1500		
0		Ground Surface	0.0								
0.5		CONCRETE	0.5								
1		B25-1 (0.5'-5') Fine grained; grayish to light brown; micaceous silty sand with minor clay component; no petroleum odor		B25-1		ND / ND	0.6				
5		B25-2 (5'-10') Fine grained; light to reddish brown with black seams; micaceous silty sand; saprolitic; slight petroleum odor	5.0	B25-2		ND / .531	7.0				
10		B25-3 (10'-15') Fine grained; brown to tannish brown with black seams; micaceous silty sand; saprolitic; slight petroleum odor	10.0	B25-3		ND / ND	25.6				
15		B25-4 (15'-20') Fine to medium grained; brown to light brown with black seams; weathered micaceous silty sand; small rock fragments evident; petroleum odor	15.0	B25-4		13.6 / ND	39.0				
20		B25-5 (20'-25') Fine to medium grained; brown to tannish brown with black seams; weathered micaceous silty sand; small rock fragments evident; petroleum odor	20.0	B25-5		ND / ND	57.3				
25			25.0				133				

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

GREENE
ENVIRONMENTAL SERVICES LLC
200 Buckwheat Lane
Rocky Mount, VA 24151

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B25

Diagram of Monitoring Well: MW25

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							500	1000	1500	
26		B25-6 (25'-30') Fine to medium grained; tannish brown; micaceous silty clay; small rock fragments evident; strong petroleum odor		B25-6		63.9 / 4,760	57.3			
27							757.7			
28										
29										
30			30.0							
31		B25-7 (30'-32') Fine grained; tan to grayish brown; micaceous silty sandy clay; weathered saprolitic texture; petroleum odor		B25-7		ND / 3.67				
32		Observed rod refusal approximately 32 feet bgs Converted from direct push to hollow-stem auger drilling techniques.	32.0				153.3			
33		B25-8 (32'-35') Fine grained; dark brown; micaceous silty clay; petroleum odor.		B25-8		ND / 0.770				
34							133			
35		No additional samples collected. Soil boring B25 converted to MW25 approximately 45' bgs	35.0							
36										
37										
38										
39										
40										
41										
42										
43										
44										
45		End of Borehole	45.0							
46										
47										
48										
49										
50										

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

GREENE
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200 Buckwheat Lane
Rocky Mount, VA 24151

Sheet: 2 of 2

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B26

Diagram of Monitoring Well: MW26

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE		PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	VOC Concentration ppm 1500 3000 4500			
0		Ground Surface	0.0						
0.5	■	ASPHALT	0.5						
1		B26-1 (0.5'-5') Fine grained; brown to reddish brown with black seams; micaceous silty sand; saprolitic; no petroleum odor		B26-1	NA / NA	0.0			
5		B26-2 (5'-10') Fine grained; brown with black seams; micaceous silty sand with minor clay component; saprolitic; no petroleum odor	5.0	B26-2	NA / NA	1.5			
10		B26-3 (10'-15') Fine to medium grained; brown to reddish brown with black seams; micaceous silty sand; weathered rock fragments evident; slight petroleum odor	10.0	B26-3	NA / NA	5.5			
15		B26-4 (15'-20') Fine grained brown; micaceous silty sand with minor clay component; saprolitic; slight petroleum odor	15.0	B26-4	ND / .385	23.1			
20		B26-5 (20'-25') Fine to medium grained; brown to reddish brown micaceous silty clay; larger mica fragments; slight petroleum odor	20.0	B26-5	ND / .497	27.8			
25			25.0			5,939			

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

GREENE
ENVIRONMENTAL SERVICES LLC
200 Buckwheat Lane
Rocky Mount, VA 24151

Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B26

Diagram of Monitoring Well: MW26

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE		PID READINGS			MONITORING WELL DIAGRAM	
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							1500	3000	4500	
26		B26-6 (25'-28') Fine to medium grained; brown to reddish brown micaceous silty clay; larger mica fragments; strong petroleum odor		B26-6		6.42 / 430	27.8	218.1		
27		Observed rod refusal approximatley 28 feet bgs Converted from direct push to hollow-stem auger drilling techniques.	28.0							
28		B26-7 (28'-30') Fine grained; light brown; micaceous silty sand; moisture evident; strong petroleum odor		B26-7		ND / 2.36		115.2		
29			30.0							
30		B26-8 (30'-35') Fine grained; dark brown; micaceous silty sand; very strong petroleum odor.		B26-8		23.3 / 354				
31										
32										
33										
34										
35		No additional samples collected. Soil boring B26 converted to MW26 approximately 45' bgs	35.0					5,939		
36										
37										
38										
39										
40										
41										
42										
43										
44										
45		End of Borehole	45.0							
46										
47										
48										
49										
50										

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES



Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B27

Diagram of Monitoring Well: MW27

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE		PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	VOC Concentration ppm 2.5 5 7.5			
0		Ground Surface	0.0						
0		ASPHALT	0.5						
0.5		B27-1 (0.5'-5') Fine grained; reddish brown with white seams; micaceous silty clay; no petroleum odor		B27-1	NA / NA	0.0			
5.0		B27-2 (5'-10') Fine grained; reddish brown with white and black seams; micaceous silty clay; no petroleum odor		B27-2	NA / NA	0.0			
10.0		B27-3 (10'-15') Fine grained; brown to dark orangish brown with white and black seams; micaceous silty clay with minor sand component; no petroleum odor		B27-3	NA / NA	0.0			
15.0		B27-4 (15'-20') Fine grained; dark brown with white and black seams; micaceous silty clay with minor sand component; no petroleum odor		B27-4	ND / ND	0.6			
20.0		B27-5 (20'-25') Fine grained; dark to light brown with mottled seams; micaceous silty sandy clay; slight petroleum odor		B27-5	5.35 / ND	0.0			
25.0						0.5			

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

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Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B27

Diagram of Monitoring Well: MW27

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE		PID READINGS		MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm	
26		B27-6 (25'-27') Fine grained; dark to light brown with mottled seams; micaceous silty sandy clay; slight petroleum odor		B27-6		5.58 / ND	0.1	
27		Observed rod refusal approximatley 27 feet bgs Converted from direct push to hollow-stem auger drilling techniques.	27.0					
28		B27-7 (27'-30') Fine grained; dark brown with mottled seams; micaceous silty sand; slight petroleum odor		B27-7		ND / ND	0.3	
29			30.0					
30		B27-8 (30'-35') Fine grained; light brown with white seams; micaceous silty sand; slight petroleum odor		B27-8		ND / ND	0.5	
31								
32								
33								
34								
35		No additional samples taken. Converted B27 into MW27 at approximately 45 feet bgs	35.0					
36								
37								
38								
39								
40								
41								
42								
43								
44								
45		End of Borehole	45.0					
46								
47								
48								
49								
50								

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES



Project No: FMMD1004

Project: INTERIM AUTHORIZATION CAP IMP

Client: T & M, M OF D, L.L.C.

Location: MEADOWS OF DAN FOOD MARKET

Log of Borehole: B28

Diagram of Monitoring Well: MW28

Geologist: ADAM FLORA

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE		PID READINGS			MONITORING WELL DIAGRAM	
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			
							2000	4000	6000	Well Completion Details
0		Ground Surface	0.0							
0.5		ASPHALT	0.5							
0.5 - 5.0		B28-1 (0.5'-5') Fine grained; Red to tannish brown with black seams; silty sandy clay; saprolitic; no petroleum odor	5.0	B28-1		NA / NA	0.0			
5.0 - 10.0		B28-2 (5'-10') Fine to medium grained; light brown with black seams; silty clay; larger rock fragments evident; saprolitic; no petroleum odor	10.0	B28-2		NA / NA	0.0			
10.0 - 15.0		B28-3 (10'-15') Fine to medium grained; brown to tannish brown with black seams; micaceous silty sand; larger quartz fragments evident; no petroleum odor	15.0	B28-3		NA / NA	0.0			
15.0 - 20.0		B28-4 (15'-20') Fine grained; light brown; weathered micaceous silty sand; slight petroleum odor	20.0	B28-4		ND / ND	0.1			
20.0 - 24.0		B28-5 (20'-24') Fine grained; light brown; weathered micaceous silty sand; slight petroleum odor	24.0	B28-5		ND / ND	1.1			
24.0		Observed rod refusal approximatley 24 feet bgs Converted from direct push to hollow-stem auger drilling techniques.	24.0				7,137			

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

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200 Buckwheat Lane
Rocky Mount, VA 24151

Sheet: 1 of 2

Project No: FMMD1004

Log of Borehole: B28

Project: INTERIM AUTHORIZATION CAP IMP

Diagram of Monitoring Well: MW28

Client: T & M, M OF D, L.L.C.

Geologist: ADAM FLORA

Location: MEADOWS OF DAN FOOD MARKET

Generation Date: 01/15/15

SUBSURFACE PROFILE				SAMPLE			PID READINGS			MONITORING WELL DIAGRAM
Depth	Symbol	Description	Depth	Number	Type	Lab Results (TPH-DRO) (TPH-GRO)	VOC Concentration ppm			Well Completion Details
							2000	4000	6000	
25		B28-6 (24'-30') Fine grained; light brown; micaceous silty sand; moisture evident; slight petroleum odor					1.1			
26				B28-6		ND / ND	0.7			
27			30.0							
28										
29										
30		B28-7 (30'-35') Fine grained; light brown; micaceous silty sand; groundwater present; strong petroleum odor								
31				B28-7		129 / 1,860			7.137	
32										
33										
34										
35		No additional samples collected. Soil boring B28 converted to MW28 approximately 45' bgs	35.0							
36										
37										
38										
39										
40										
41										
42										
43										
44										
45			45.0							
46		End of Borehole								
47										
48										

Drill Method: DIRECT PUSH/HOLLOW-STEM AUGER

Drilled by: DAVIDSON DRILLING, INC.

Drill Date: 07/31/14 & 08/01/14

Hole Size: 6.875 INCHES

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Rocky Mount, VA 24151

APPENDIX D

Laboratory Data

Laboratory Test Results
Chain of Custody Documentation