



**Additional Monitoring Well Installation Work Plan
Gasoline Fueling Station – Royal Farms #64
7950 Pulaski Highway, Rosedale, MD 21237
MDE Case No. 10-0339-BA
MDE Facility ID 3975**

AEC Project Number: 05-056RF064

Prepared for:

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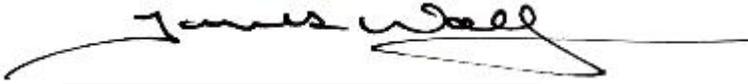
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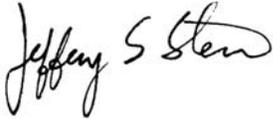
August 13, 2013

ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC

Additional Monitoring Well Installation Work Plan



Prepared by: James Wolf
Title: Project Manager
Date: August 13, 2013



Reviewed by: Jeffery Stein, P.G.
Title: Principal
Date: August 13, 2013

INTRODUCTION

This Additional Monitoring and Installation Work Plan has been developed for Royal Farms Gasoline Fueling Station No. 64 located at 7950 Pulaski Highway Rosedale, Maryland 21237 (hereinafter referred to as the “Site”). A Site Vicinity map is attached as Figure 1. This work plan is intended to satisfy certain requirements outlined in a Maryland Department of the Environment (MDE) letter titled “Corrective Action Plan Addendum Response”, dated May 29, 2013.

On December 15, 2009, the MDE OCP opened a case in response to a report of evidence of a petroleum spill which occurred on the Site. Remedial activities began on the same day and are currently ongoing. Between December 15, 2009 and December 14, 2011, the primary means of recovery was through enhanced fluid recovery technology (EFR). As of December 14, 2011 the dual phase extraction remediation system has been used for continuous liquid, dissolved, and vapor phase recovery.

A schedule of quarterly sampling of the well network has been maintained since the discovery of the release. The well network currently consists of 24 recovery and monitoring wells. Nine wells are located onsite and 15 are located on the 1205 and 1207 Chesaco Avenue properties to the northwest and down-gradient of the Site. Nine wells are utilized as recovery wells for the dual phase extraction remediation system.

Laboratory results from historical sampling efforts reported concentrations of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH) gasoline range organics (GRO), and TPH diesel range organics (DRO) in the northwestern-most monitoring wells (MW-23 and MW-24). As such, it was determined by MDE that additional monitoring wells are required to delineate the petroleum hydrocarbon plume.

The primary purpose of this work will be to install two monitoring wells (MW-25 and MW-26) downgradient from MW-23 and MW-24 in order to delineate the dissolved phase petroleum constituents. The proposed well locations are on the 1209.5 Chesaco Avenue property and are included in Figure 2 of the attachments. The following is a description of the scope of work to be conducted:

DESCRIPTION OF INVESTIGATIVE METHODS

Monitoring Well Installation and Development Procedures

Monitoring/recovery well borings will be advanced using hollow stem auger (HSA) methods. Proposed monitoring/recovery well locations are depicted on Figure 2 of Attachment A. An AEC Field Geologist will log the geologic conditions of the borings and field screen soil cores for volatile organic compounds (VOCs) using a photoionization detector (PID). Soil for screening and logging will be obtained using a split-spoon sampler and Standard Penetration Testing (SPT) procedures.

Both monitoring wells will be constructed using 2-inch diameter PVC slotted screen and riser. Based on historic groundwater levels in the vicinity of the proposed wells (0 to 5 feet below ground surface (bgs)), the screen length for the monitoring wells will be approximately 20 feet and the riser length will be approximately two feet. A sand filter pack will be placed to 1-foot above the top of the screen, and a 0.5-foot thick bentonite seal will be placed above the sand and hydrated in place. The remainder of the annular space above the bentonite seal will be grouted to the surface. Proposed wells will be installed with a flush-mounted, bolt-down, steel manhole set in concrete. The PVC well heads will be secured with a locking cap.

Prior to arriving at the Site and between each soil boring, all hand augers, core barrels, cutting shoes, probe rods, tips, sleeves, pushrods, samplers, tools, and other down hole equipment will be washed using a water rinse. Fuel, lubricants, and other similar substances will be handled in a manner consistent with accepted safety procedures and standard operating practices. Public utility clearances will be obtained prior to the initiation of field activities. This will entail contacting Miss Utility at least 72 hours prior to drilling activities. All drilling and well development work will be performed by a State of Maryland-licensed well driller and appropriate well permits will be obtained from Baltimore County.

The wells will be developed using surge block and aggressive bailing techniques one week after installation. At least five well volumes of water will be removed from each well as part of the development process. If a well is bailed dry, the well will be emptied of water five times over a period not to exceed two hours. All development water will be containerized and processed through the existing treatment system.

Soil Sample Collection and Analysis Procedures

Based on the results of the PID/visual screening one sample will be collected from each borehole. Additional samples may be collected based on PID/visual observations. If no impact is apparent throughout the soil column then one sample will be collected from the zone immediately above the water table. The soil samples will be analyzed for Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) using Environmental Protection Agency (EPA) Analytical Method 8015B, and VOCs, including fuel oxygenates, via EPA Analytical Method 8260.

All samples will be collected and prepared using EPA Method 5035 via Terracore sampling. The Terracore sampler will be inserted directly into the soil core using a reusable T-handle until the sample chamber is full (approximately 5 to 10 grams of soil). The outside of the sampler will be wiped clean of any soil or debris. The soil plugs will be flush with the mouth of the sampler and any excess soil that extends beyond the mouth of the sampler will be removed. The plunger will be seated in the handle top 90° until it is aligned with the slots in the body. The sample cores will then be extruded into one methanol (5 milliliters) preserved 40 milliliter vial, two sodium bisulphate (5 milliliters) preserved 40 milliliter vials and a dry weight jar with a lid. The top and/or threads of the vials will be wiped clean and the lids quickly replaced on the vials. A clean pair of new, disposable nitrile gloves will be worn each time a soil sample is collected.

The analytical laboratory will provide the Terracore sample kits. The sample labels will be firmly attached to the container side, and the following information will be legibly and indelibly written on the labels: Facility name, Sample identification, Sample type, Sampling date and time, Preservatives added, and, Sample collector's initials. After the samples are sealed and labeled, they will be packaged on ice for transport to the laboratory.

Groundwater Sample Collection and Analysis Procedures

Groundwater sampling will be performed one week after development of the monitoring wells. Samples will be collected using a disposable high-density polyethylene (HDPE) bailer. New sections of nylon rope will be used for the bailers at each sample location. A clean pair of new, disposable nitrile gloves will be worn each time a groundwater sample is collected. Prior to the collection of groundwater samples, AEC will purge at least three well volumes from each monitoring well. Purge water will be handled in the same manner as the development water, as discussed above. The groundwater samples will be analyzed for TPH DRO and GRO using EPA Analytical Method 8015B, and VOCs, including fuel oxygenates, via EPA Analytical Method 8260.

The analytical laboratory will provide pre-preserved sample containers where appropriate. The sample labels will be firmly attached to the container side, and the following information will be legibly and indelibly written on the labels: facility name; sample identification; sampling date and time; preservatives added; and, sample collector's initials. After the samples are sealed and labeled, they will be packaged for transport to a qualified environmental laboratory. The following packaging procedures will be followed: samples will be packaged to prevent leakage or vaporization from the containers; samples will be cushioned to avoid breakage; and, ice will be added to the cooler to keep the samples cool.

Well Head Elevation Survey and Groundwater Level Gauging Procedures

The relative elevations of the top of the well casings for the new wells will be determined to within 0.01-feet using a rod and transit. An existing monitoring well will be used for the elevation reference point. Groundwater levels within each monitoring well will be measured using an electronic water level meter accurate to 0.01-feet. The electronic water level meter will be cleaned (Liquinox and water rinse) prior to use in each well.

Investigation Derived Waste Management Procedures

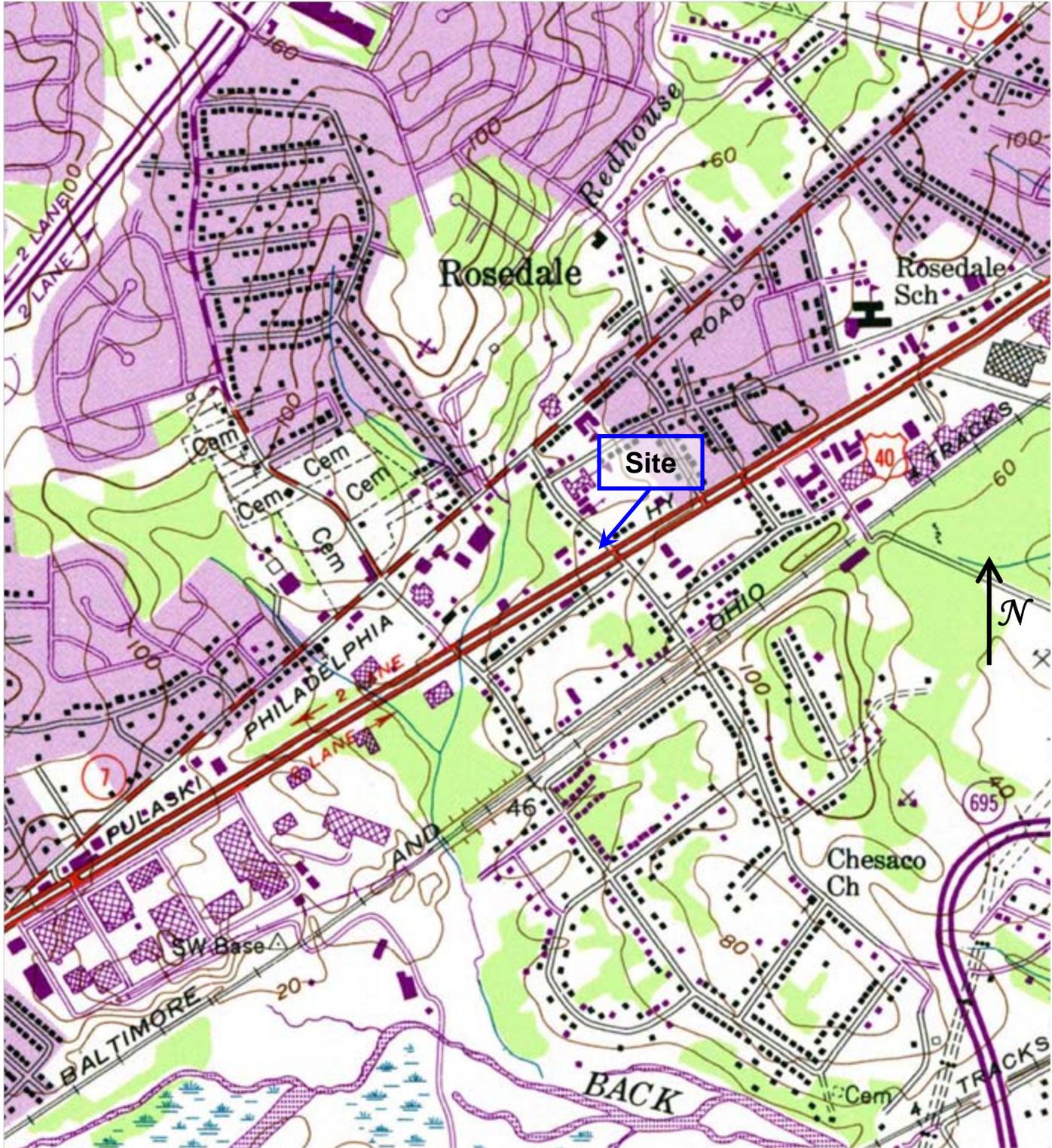
Investigation-derived soil will be containerized in 55-gallon drums, labeled (date of generation, site name/address, source, and contents), and, staged on the Site. These materials will be staged no longer than 50 days before they are characterized, transported and disposed according to applicable United States Department of Transportation (USDOT), EPA, and MDE regulations.

Reporting and Scheduling

Information developed from the investigation will be assembled into a report including the following information: report summary; physical site description; site vicinity map; sample location map; groundwater gradient map; dissolved hydrocarbon delineation maps; description of the sampling program; soil-boring and well construction logs; and, analytical laboratory results. Four hard copies and an electronic copy of the Report will be submitted to the MDE.

This effort is scheduled to take approximately three weeks of field time. AEC can begin field work within one week of finalization of an access agreement between Royal Farms and the owner of the 1209.5 Chesaco Avenue property. It is anticipated that a final report can be prepared within six weeks of access agreement execution.

Attachments



USGS Topographic Quad Map, Baltimore East, MD, 1974

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Figure 1 - Site Vicinity Map
 Royal Farms Store 64
 7950 Pulaski Highway
 Baltimore, Maryland 21237

Work Order No.:
 05-056

Report Date:
 12/2009

Drawn By:
 WEG

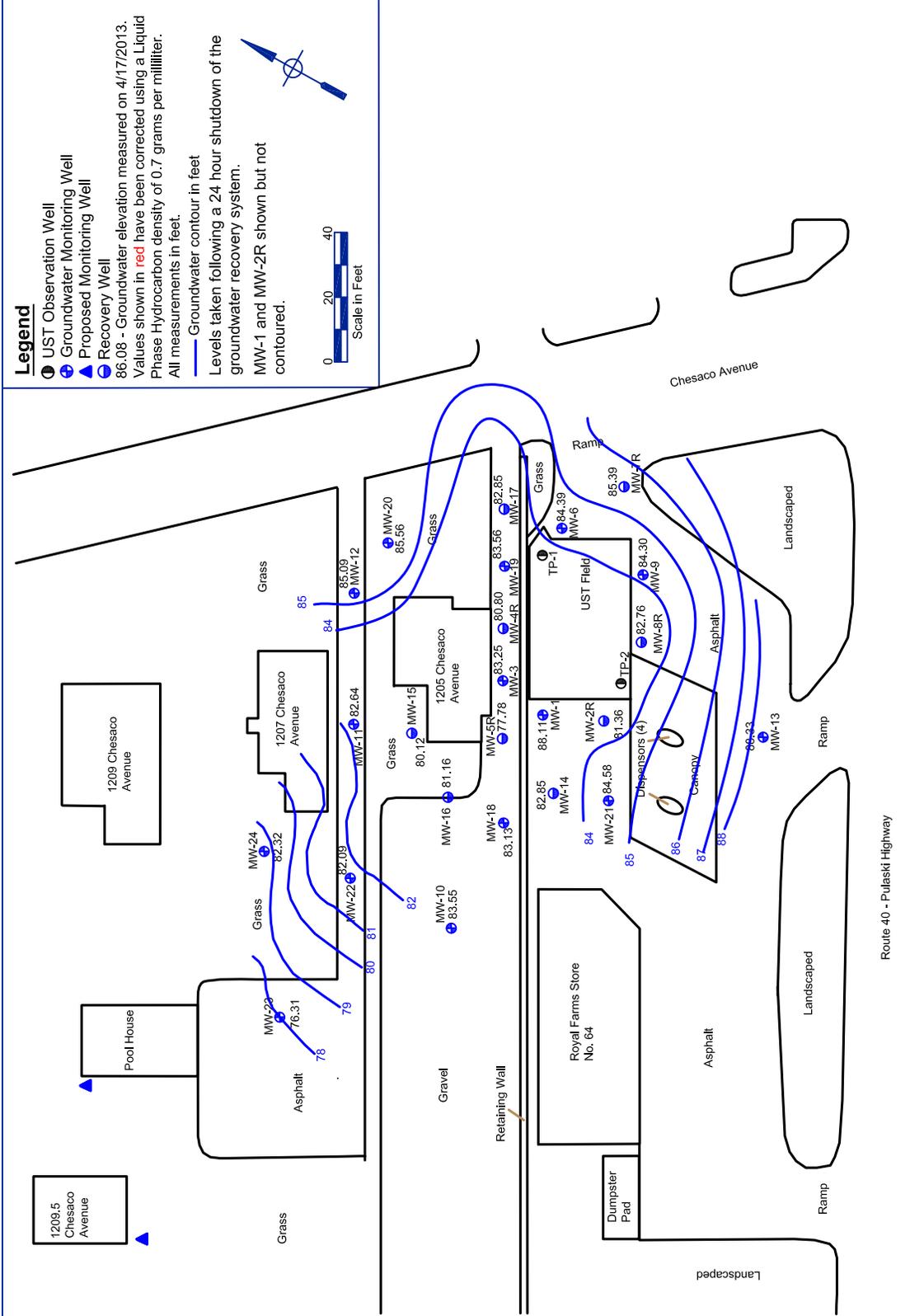


Figure 2 - Proposed Monitoring Well and Groundwater Gradient Map
 Royal Farms No. 64
 7950 Pulaski Highway
 Baltimore, MD 21237

Project No.: 05-056	Drawn by: ALF
Task No.: RF064	Date: Aug. 2013
File: Grad 1	Revision No.: 3

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Legend

- UST Observation Well
 - Groundwater Monitoring Well
 - Proposed Monitoring Well
 - ▲ Recovery Well
- 86.08 - Groundwater elevation measured on 4/17/2013.
 Values shown in red have been corrected using a Liquid Phase Hydrocarbon density of 0.7 grams per milliliter.
 All measurements in feet.
- Groundwater contour in feet
 Levels taken following a 24 hour shutdown of the groundwater recovery system.
 MW-1 and MW-2R shown but not contoured.

