

October 27, 2014

Mr. James Richmond
Maryland Department of the Environment
Oil Control Program
1800 Washington Street
Baltimore, Maryland 21230

Re: Monitoring Well MW-18S Replacement Work Plan
Monrovia BP / Former Green Valley Citgo
MDE Case # 2005-0834-FR

Dear Mr. Richmond:

Groundwater & Environmental Services, Inc. (GES) respectfully submits this *Monitoring Well MW-18S Replacement Work Plan* to the Maryland Department of the Environment-Oil Control Program (MDE-OCP) for consideration and approval for the above-referenced site. The work plan was prepared with the goal of installing one (1) 4-inch monitoring well of similar well screen specifications to MW-18S in proximity to the existing MW-18S/D nested well location and to satisfy the MDE requirement outlined in item #4 of the October 3, 2014 Revised CAP Approval letter. GES feels an additional, localized well similar to the MW-18S screen interval is necessary due to anomalous field and analytical parameter values demonstrated in the current well (MW-18S) since its installation in November 2010. Discussions of the MW-18S data anomalies have been presented in previous correspondence to the MDE-OCP including the *ISCO System Comprehensive Summary & Update to the Conceptual Site Model (CSM)* submitted September 28 2012 and the *Supplemental Chromium and Lead Investigation Summary* submitted September 28, 2012.

This planned scope of work includes the installation of one (1) 4-inch observation well (tentatively designated MW-18S-R). The replacement well is proposed to be installed approximately ten feet from the existing MW-18S/D nested well location as indicated on **Figure 1**. Note that the existing MW-18S well is a 2-inch well set within the nested MW-18S/D monitoring well casing. GES does not propose abandonment of the existing MW-18S well at this time. Future abandonment of the MW-18S well will be evaluated after sufficient sample data has been gathered to confirm the suitability of the proposed MW-18S-R well as a replacement.

GES will provide a qualified geologist to perform oversight during the installation of the MW-18S-R monitoring well. GES personnel will identify and resolve potential conflicts (i.e., subsurface utilities, overhead restrictions, facility features, etc.) with the proposed well location prior to initiation of installation activities. The final well locations may be adjusted during field activities. In accordance with GES health and safety requirements for drilling operations, the drilling location will be hand-cleared using an air knife to a depth of at least five feet (ft) below ground surface (bgs). The proposed well construction details, in comparison to those for the existing MW-18S/D wells, are shown in **Table 1** (next page).

The replacement 4-inch well will be installed in a single 10-inch diameter borehole. Borehole advancement will be performed using pneumatic downhole hammer or air rotary techniques by a



Maryland-licensed driller. The installation of the monitoring well will be properly permitted through application with Frederick County.

Characterization and Screening

During drilling, samples will be collected from the retrieved core cuttings at five-foot increments. These samples will be sealed in airtight bags to allow volatilization and subsequently screened for volatile organic compounds (VOCs) with a hand-held Photoionization Detector (PID) with 10.6-eV bulb strength. A qualified GES geologist will characterize soil/rock composition during well installation efforts and record any VOC response from the sample screenings. Additionally, two samples collected from the proposed well screen interval will be sent to the laboratory to be analyzed for total lead, chromium, iron, and hexavalent chromium as required by the MDE.

Well Construction

The well will be constructed with 4-inch diameter poly vinyl chloride (PVC) casing and 4-inch 0.020-slot PVC screen pipe. As noted in **Table 1**, the replacement well will be screened from 45 to 75 ft bgs. Total depth will be 75 ft bgs. Sand pack will be placed surrounding the screen and brought up to at least 12 inches above the screen. A hydrated bentonite seal will be installed above the screen sand. Finally, the borehole will be filled with concrete grout via tremmie pipe to the surface and finished with a flush mount 10- or 12-inch diameter manhole. The completed monitoring well will be capped with a lockable threaded plug. A cross section illustrating a typically constructed monitoring well is depicted on **Figure 2**.

The comparative monitoring well depths and screen intervals are shown in **Table 1** below.

Table 1. Comparison of Proposed and Existing Monitoring Well Construction specifications

WELL ID	Well Diameter (inches)	Total Well Depth (feet below surface)	Top of Screen (feet below surface)	Bottom of Screen (feet below surface)
MW-18S	2	70	45	70
MW-18S-R*	4	70	45	70
MW-18D	2	130	120	130

* Proposed monitoring well

Well Development

Upon completion of the replacement well installation, the well will be developed using a surge and pump method to remove any residual suspended solids remaining from the drilling installation and to establish connectivity with the aquifer.

Surveying

The newly installed well will be surveyed in relation to at least three existing wells within the network. The elevation of the new well will be referenced from a marked location at the top-of-casing. This interior mark on the casing will provide a consistent reference point for future depth to water groundwater measurements.



Waste Disposal

All soil and drill cuttings generated during the proposed MW-18S-R installation activities will be properly containerized and labeled in 55-gallon steel drums and stored in a secure onsite location until off-site disposal arrangements have been made. All purge water generated from well development activities following installation will be properly containerized, labeled and stored in a secure on-site location until disposal. All soil, cuttings and wastewater generated from the drilling and development activities will be transported to an approved disposal facility with proper manifest documentation.

Boring Log

A boring log, noting the encountered lithology, PID screening values and well construction specifications, will be created for the new well and submitted to the MDE-OCP during the following quarterly report submission. Details of any waste generation and disposal related to the well installation and development will also be reported in the quarterly correspondence.

GES will provide the MDE-OCP five (5) days notice prior to the planned day of commencement of installation activities.

Thank you for your consideration with this well installation request. If you have any questions or would like additional information, please contact the undersigned at 800-220-3606, extension 3726 or 3717 respectively, or Herb Meade at 410-261-5450.

Sincerely,

A handwritten signature in black ink, appearing to read 'Peter Reichardt', written in a cursive style.

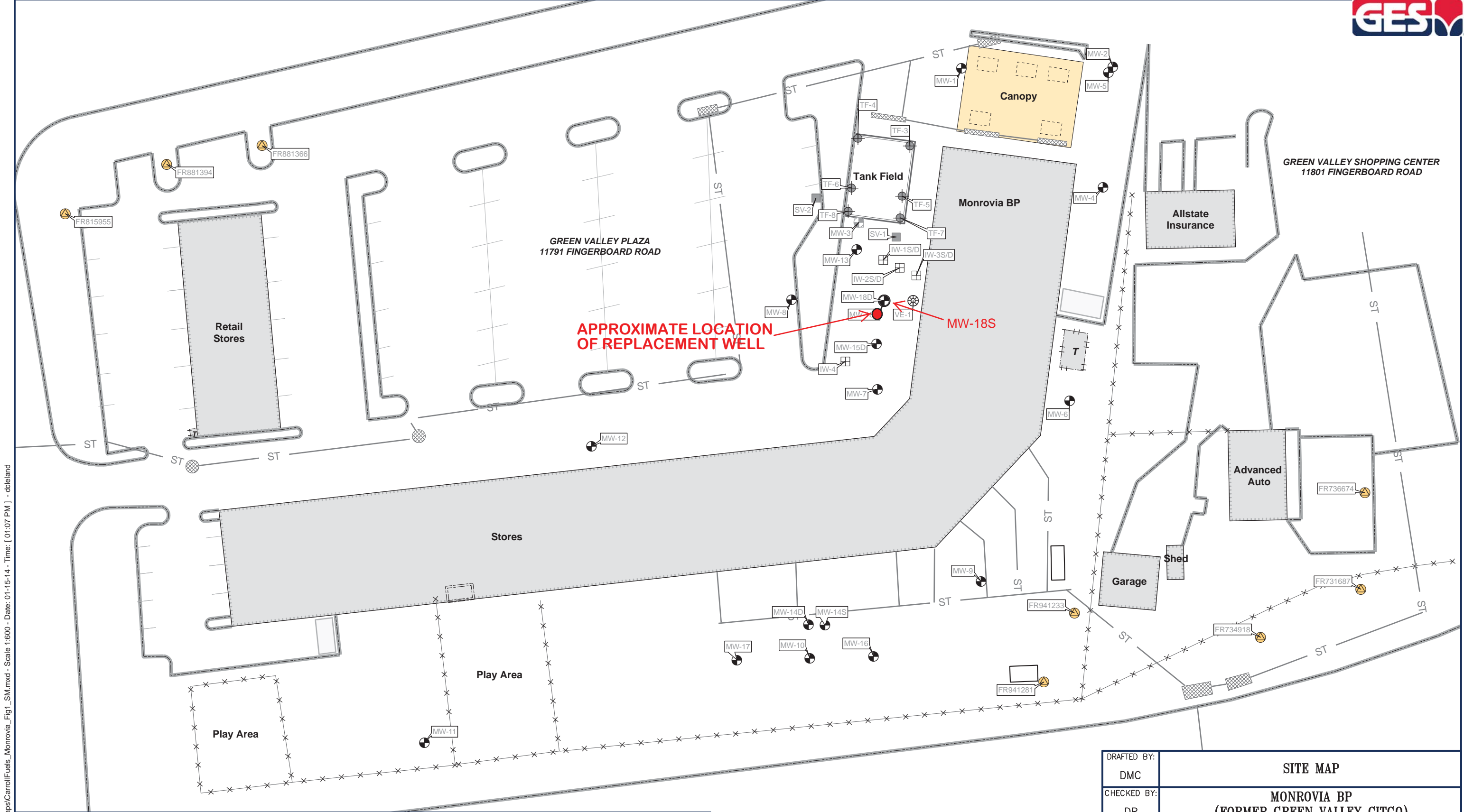
Peter Reichardt
Project Hydrogeologist

A handwritten signature in black ink, appearing to read 'Gregory Reichart', written in a cursive style.

Gregory Reichart
Project Manager

Enclosures

- c: Jim Richmond – MDE (2 additional copies & CD)
- Herb Meade – Carroll Independent Fuels Company
- Barry Glotfelty – Frederick County Health Department
- Samir Andrawos – Timbercrest Limited Partnership
- Jennifer Andrawos – Timbercrest Limited Partnership
- File – GES, MD (PSID 509136)

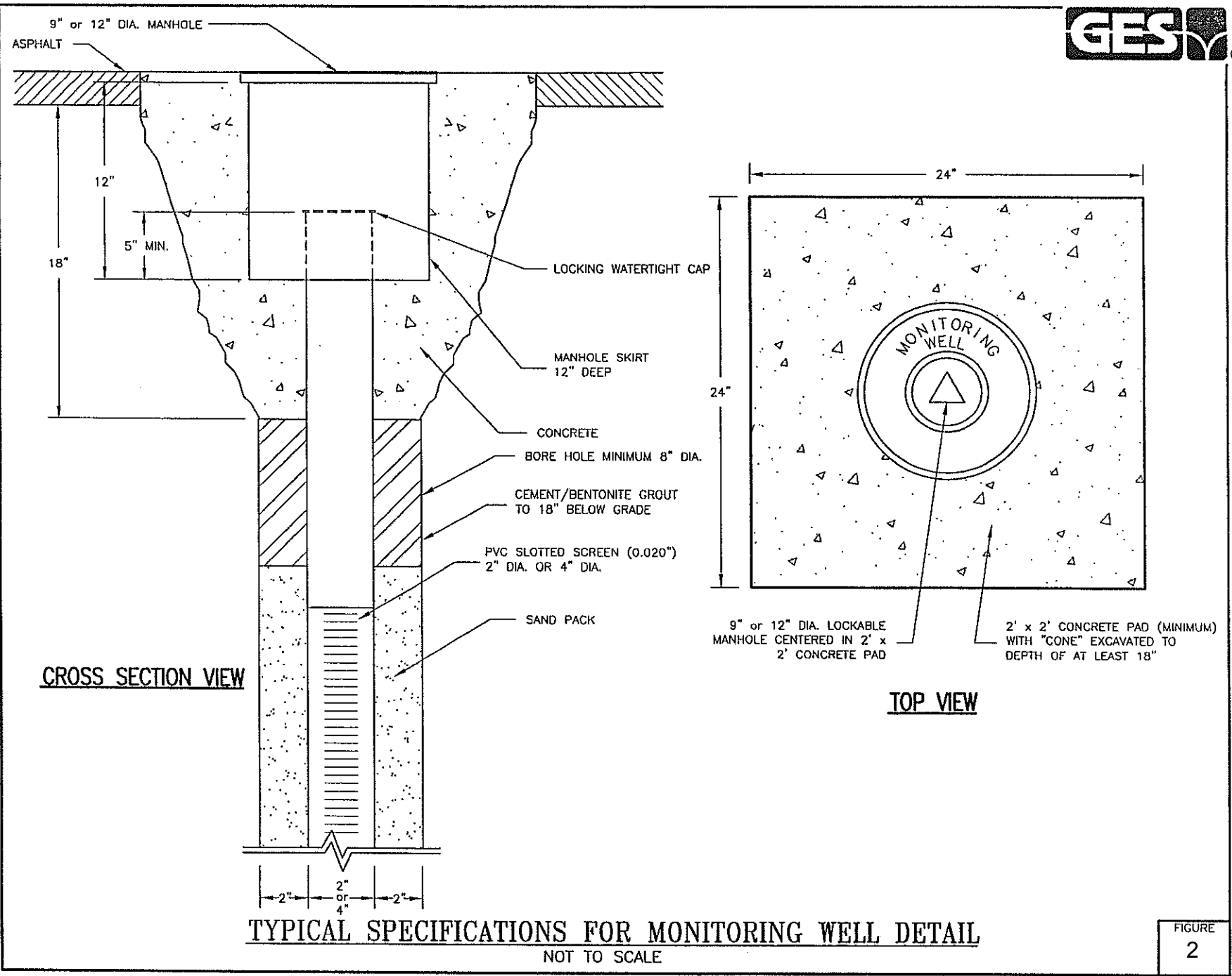


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Legend			
	Abandoned Well		Abandoned Soil Vapor Point
	Monitoring Well		Injection Well
	Potable Well		Nestled Obs Well
	Tank Field Well		SVE Well
	Curbing		Fence
	Building		Parking
	Canopy		Storm Sewer
	Dispenser		Catch Basin
	Propane AST		Dumpster
	Pump Room Door		Tank Field
	Transformer		LOCATION OF REPLACEMENT WELL

Source:
NAIP aerial photograph for Frederick Co.
Based on GIS data provided by
Environmental Alliance, Inc.

DRAFTED BY: DMC	SITE MAP	
CHECKED BY: DR		
REVIEWED BY: GR		
NORTH	MONROVIA BP (FORMER GREEN VALLEY CITGO) 11791 FINGERBOARD ROAD MONROVIA, MARYLAND	
 	Groundwater & Environmental Services, Inc. 1350 BLAIR DR, SUITE A, ODENTON MD 21113	
	SCALE IN FEET	DATE
0 50	1-15-14	1



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TYPICAL SPECIFICATIONS FOR MONITORING WELL DETAIL

NOT TO SCALE

FIGURE
2