



November 4, 2014

Jeannette DeBartolomeo  
Environmental Compliance Specialist  
MDE-OCP  
1800 Washington Blvd.  
Suite 620  
Baltimore, MD 21230

**RE: Revised Scope of Work/Supplemental Work Plan**  
Calvert Citgo (2815 Northeast Road)  
2802 Northeast Road (McMillan Residence – Currently Vacant)  
2794 Northeast Road (O’Brien Residence)  
North East, Maryland 21901  
Facility No. 5678  
**REPSG Project Reference No. 005977.130.01**

Dear Ms. DeBartolomeo:

This correspondence is being submitted by REPSG on behalf of the remediating parties for the above-referenced Site to address the items requested by the MDE during the *Project Status Meeting* that was held on October 6, 2014. This *Project Status Meeting* was held in order to discuss the current status of the above-referenced Site, and to establish a revised scope of work moving forward. The MDE requested that the following items, in particular, be addressed:

- An evaluation of the potential to conduct downhole geophysics on the drinking water supply well located at 2802 Northeast Road;
- The potential to relocate the proposed deep zone monitoring well/potential replacement potable well to the rear of the property located at 2794 Northeast Road (and subsequently further away from the known groundwater contaminant plume at the Site);
- A figure of the proposed deep zone monitoring well to be installed;
- Plans for well drilling and construction (discussed as appropriate in the individual sections of this revised scope of work);

- A schedule for implementation of the proposed work; and
- An update on short-term and long-term remedial goals at the Site.

### **Downhole Geophysics Evaluation**

REPSG has selected Advanced Geological Services, Inc. (AGS) to complete the geophysical survey of drinking water well DW-005, located at 2802 Northeast Road. This well was selected for the completion of the geophysical survey as it is the deeper of the two potable wells currently being monitored as part of this project, and the residence it supplies is currently vacant. The well is approximately 250 feet deep and is cased to approximately 87 feet. The primary objective of this survey is to determine the location and orientation of potential water-bearing fractures. The following borehole geophysical logs will be acquired:

- Three-arm Caliper;
- Acoustic Televiwer (ACTV);
- Optical Televiwer (OPTV); and
- Heat-Pulse Flowmeter (HPFM).

The Three-Arm Caliper log will be acquired with a Digital CompuLog System VI manufactured by Century Geophysical Corporation, and the ACTV, OPTV, and HPFM logs will be collected with a Matrix System manufactured by Mount Sopris Instrument Company.

A letter report will be produced following the completion of the survey by AGS that details the methods, results, and conclusions of the investigation. The logs of the survey will be presented in a color hardcopy format at a scale 1 inch = 20 feet, as well as full-color digital image format (PDF) on CD ROM. AGS will provide a preliminary log on the business day following the completion of field work. The full report will be provided within two (2) weeks of the complete of the survey.

### **Proposed Deep Zone Monitoring Well Relocation Information**

In the *Pre-Meeting Documentation* letter submitted by REPSG to the MDE on October 1, 2014, REPSG initially recommended installing the proposed deep zone well within the front yard of 2794 Northeast Road (the O'Brien residence), approximately 23.5 feet southeast of the current drinking water well (DW-004) in place at the residence.

During the October 6, 2014 *Project Status Meeting* the MDE requested that the potential to relocate the proposed deep zone monitoring well to the rear of the property (and subsequently further away from the known groundwater contaminant plume at the

Site) be assessed. Concerns were raised during the meeting about the feasibility of this relocation, due to the presence of the septic tank/leach field at the rear of the residence.

REPSG contacted the Cecil County Health Department in order to determine the requirements regarding the proximity of drinking water wells to septic systems. The Health Department indicated that all potable wells must be set a minimum of 100 feet from a septic tank and any associated leach fields.

After consulting with the developer of both properties (Mr. Robert McMillan) it was determined that due to the size and placement of the septic tanks/fields at the rear of the homes, that it would not be possible to install a potable well 100 feet from the septic tank/field at the rear of the residence and remain within the property boundary.

In the absence of obtaining long-term access to the vacant lot located directly behind 2794 North East Road, such as through the purchase of the property, for the purposes of installing the proposed well, REPSG does not recommend relocating the proposed deep zone monitoring well from the front of the residence to the rear of the residence.

A diagram depicting the proposed location of this well is included as an attachment to this letter.

### **Proposed Deep Zone Monitoring Well Construction**

The proposed well will be drilled and constructed in accordance with the MDE regulations found at *Title 26, Subtitle 4, Chapter 4*.

After consultation with qualified licensed drillers experienced in the area, REPSG has selected Percussion Air Rotary technology as the preferred drilling method for the project. Percussion air rotary utilizes a pneumatic reciprocating piston-driven "hammer" to energetically drive a heavy drill bit into the rock. The drill bit is hollow steel and has approximately twenty millimeter thick tungsten rods protruding from the steel matrix as "buttons". The tungsten buttons are the cutting face of the bit. Cuttings from this drilling method are blown outside of the rods and collected at the surface.

The benefits of this method include ease and speed of drilling through geological conditions likely to be encountered, and low potential of cross-contamination between aquifer zones, compared to methods employing drilling muds. The percussion air rotary method is appropriate for the local hydrogeological conditions (Hydrogeologic Area No. 3), and applicable COMAR regulations.

The proposed deep zone monitoring well will be installed in two (2) phases.

During the first phase of construction, the well will be drilled to an estimated total depth of 300 feet below grade (fbg). The construction of the well will consist of two (2) zones. The top zone will be drilled with a nominal 6-inch diameter to the depth of competent bedrock, to be determined during drilling, but estimated to be between 90 to 100 feet below grade. A 6-inch (minimum) PVC casing will be installed, and keyed into the

bedrock. The casing will be grouted in place to seal off groundwater infiltration from the upper, unconsolidated, zones.

The bottom zone will be drilled with a nominal diameter of at least 6 inches, through the PVC casing, from the bottom of the PVC casing to a terminal depth of approximately 300 fbg. The borehole will be left, temporarily, as an open hole pending completion of a downhole geophysical survey, conducted as per the scope proposed within this letter for implementation on the current potable well located at 2802 North East Road, and the completion of yield/viability assessment (previously detailed in the October 1, 2014 *Pre-Meeting Documentation* letter).

A summary of the geophysical survey and yield/potability testing results will be prepared and submitted to the MDE. Based on those results, the remediating parties will consult with MDE on the advisability of converting the test well to a replacement water well. If the yield/potability testing of the well that will be conducted on the various zones in the bedrock identified during drilling as highly fractured and/or significantly water bearing, yields favorable results (i.e., well yields sustained 1 gpm of water that meets MCLs), then the final design for well completion, such as pump specifications, details of pitless adapter, etc. will be submitted along with the results. If, upon review, the MDE authorizes conversion into a potable drinking water well, which can then replace the current well located at the residence, then the second phase of well construction will be implemented.

This second phase of well construction will include installing a 4-inch inner casing from the ground surface to the top of the final selected pumping depth, estimated to be at 270 fbg as well as installing 30 feet of 4-inch PVC screening at the final pumping depth interval, estimated to be at 270 to 300 fbg.

Isolation of the selected pumping zone, using grouting in the annulus between the well bore and the inner casing will be provided, and a submersible well pump will be installed.

Certain modifications may be needed to drilling methods based on subsurface conditions encountered. For example, the use of drilling mud may be needed to keep the top hole fully open after drilling, and until the outer casing is installed.

A figure depicting the construction of the proposed deep zone monitoring well is included as an attachment to this letter.

### **Schedule of Implementation of the Proposed Scope of Work**

Within one (1) week of approval of this revised scope of work/supplemental work plan by the MDE and the Client, REPSG will contact the owners of the residences located at both 2794 Northeast Road and 2802 Northeast Road in order to receive their written

approval and consent for conducting the proposed work within their property boundaries.

Within two (2) weeks following the receipt of homeowner approval for the proposed work, REPSG will contract the selected geophysics survey company (AGS) to complete the geophysical survey on drinking water well DW-005. It is anticipated that AGS will be able to complete the survey within two (2) to four (4) weeks of contracting. Receipt of final results of the survey is anticipated to take up to two (2) weeks.

Prior to completion of the downhole geophysical survey, and the subsequent receipt of results, REPSG will initiate the permit process for the installation of the proposed deep zone monitoring well, and will contract the selected drilling company for the installation of the proposed deep zone well. The date of installation of this well will be set for approximately 45 days following the receipt of the downhole survey results in order to allow for a thorough evaluation of those results, and for construction needs to be adjusted accordingly.

The construction of the proposed deep zone monitoring well, including performance of a downhole geophysical survey and yield/viability testing, is anticipated to require up to 5 days. Submittal and receipt of all downhole geophysical survey and yield/viability testing results is anticipated to take an additional two (2) to three (3) weeks. The date of conversion from a monitoring well to a potable well is set for approximately 21-28 days following the receipt of these results to allow for a thorough evaluation of results, and for conversion needs to be adjusted accordingly.

A period of four (4) to eight (8) weeks will be allotted following the conversion of the proposed deep zone well to a potable well in order to establish that the withdrawal volume is sufficient before the current in-place drinking water well is properly abandoned. If this well has proven to be viable in terms of quality and quantity of water, the process to install a similar new potable well within the property boundary of 2802 North East Road.

A table depicting this timeline has been included as an attachment to this letter.

### **An Update on Short-Term and Long-Term Remedial Goals at the Site**

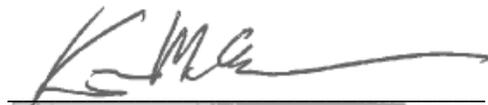
The goal of the measures proposed within this letter is to permanently resolve the issue of contaminated potable water wells at the two adjacent residential properties to the east of the Site, at a highest priority basis. While the approved corrective action plan (CAP) for the Site (currently 'on hold' pending the approval of the '*Proposed Interim Remedial Measures*' as per the MDE during the October 6, 2014 meeting) shares this objective, under the current scope of work approved within the CAP, relief to the residents of these properties is at least several years away, with probably a significantly greater period until source area remediation and natural attenuation combine to result in a viable water source returning to these two (2) existing wells.

Following the resolution of the issue of contaminated potable water wells at the two adjacent residential properties to the east of the Site, a reassessment of groundwater conditions and remedial needs at the Site will be conducted in conjunction with the MDE, and a determination as to the most efficient corrective action plan for cleanup of the groundwater contaminate plume at the Site, will be made and subsequently implemented.

**Closure**

Thank you for review of these data, and consideration of this proposed course. If you have any questions or concerns, please do not hesitate to contact our office at 215-729-3220.

Sincerely,



Kevin McAllister, P.G.  
Professional Geologist



Suzanne Shourds  
Project Manager

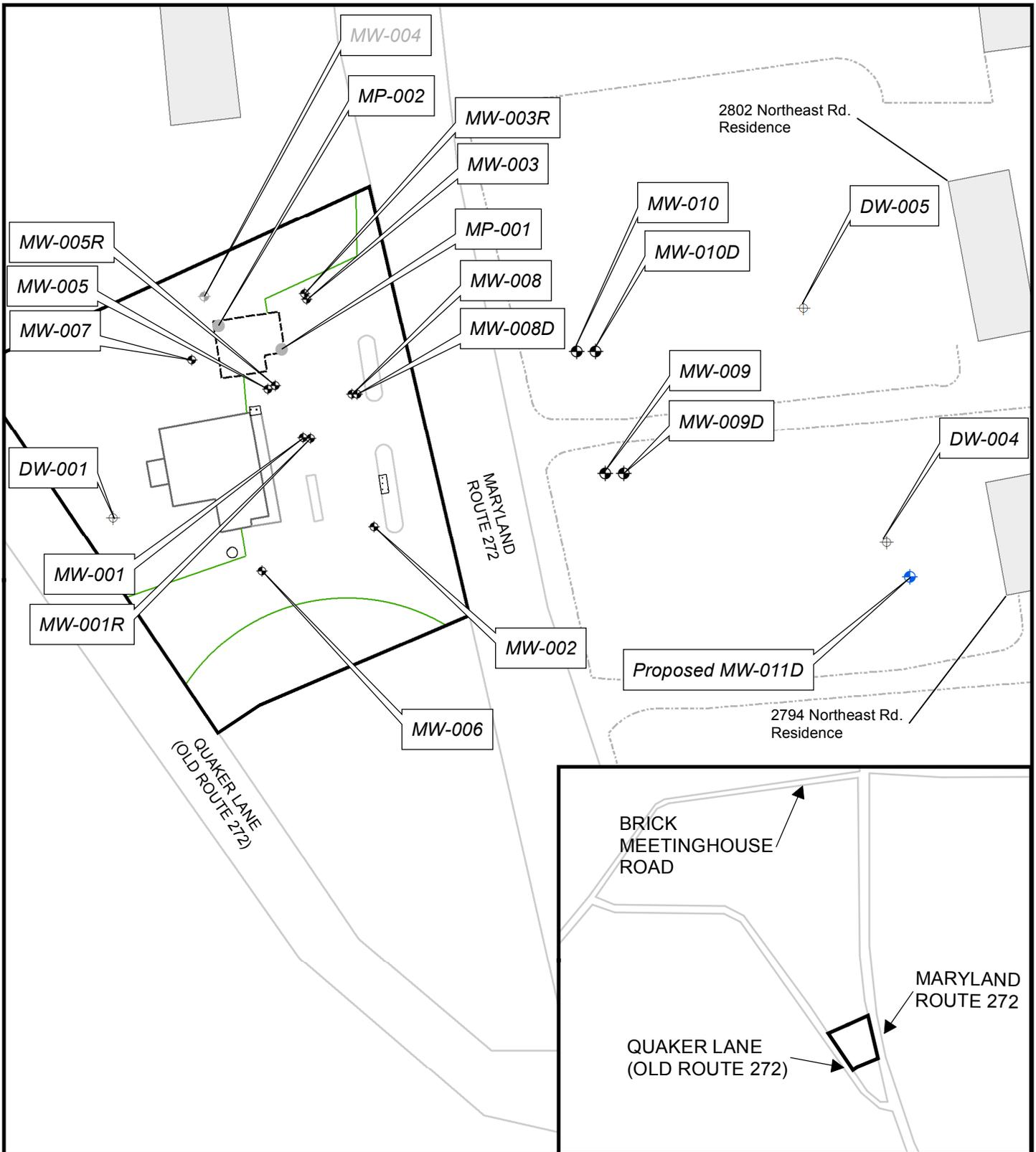


Brenda MacPhail Kellogg  
Senior Project Manager

**React Environmental Professional Services Group, Inc**

*Enclosures*

*cc: Susan Bull, Case Manager, MDE  
Prag Patel, Owner Calvert Citgo Stores  
Chris Haab, Country Stores, Inc.*

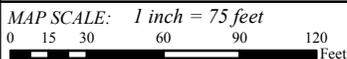


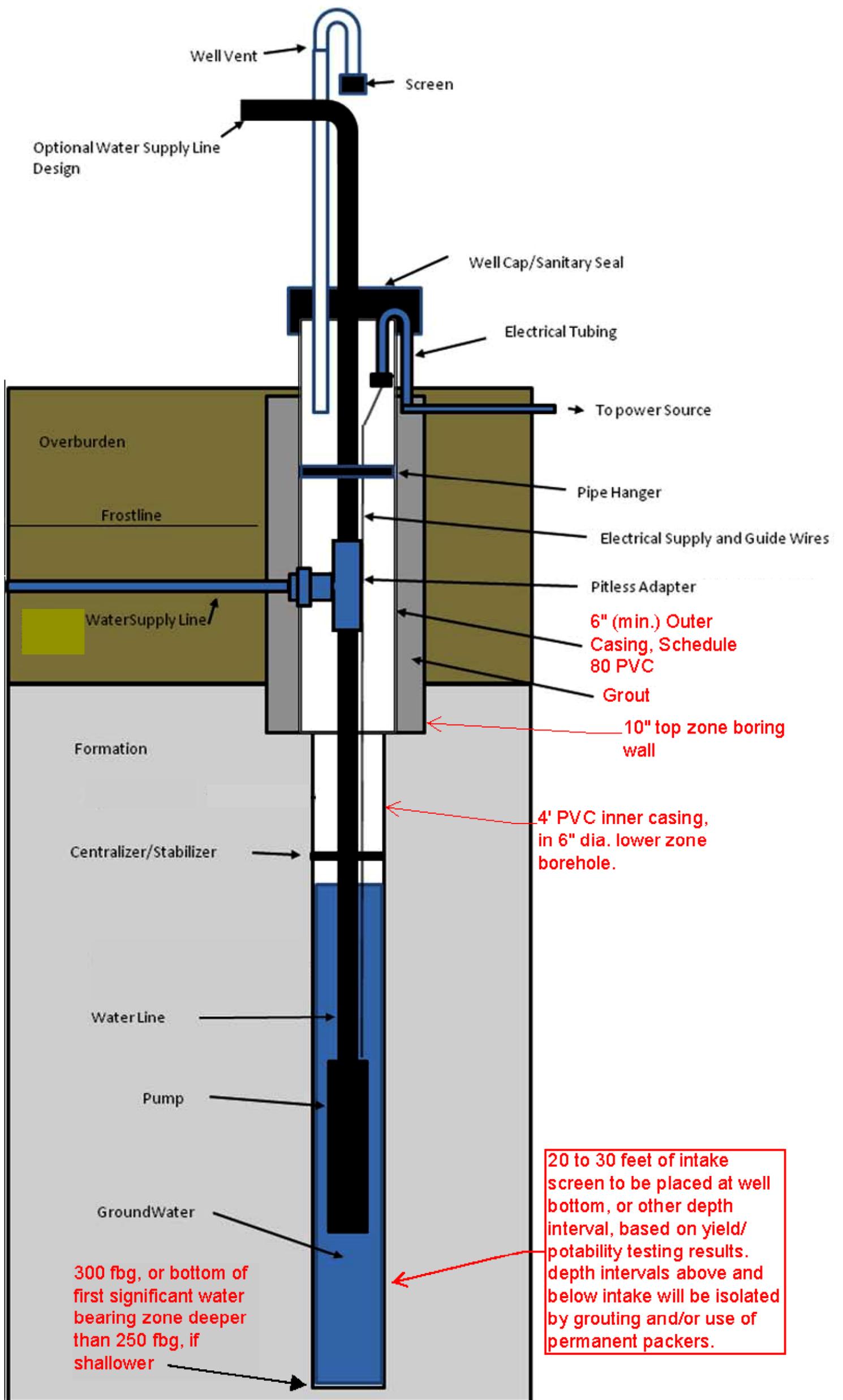
**Monitoring Well Locations**

- |                                |                      |                   |               |
|--------------------------------|----------------------|-------------------|---------------|
| Proposed Deep Zone Well        | Leak Detection Wells | Kerosene Pump     | Septic Tank   |
| Monitoring Well                | Potable Well         | Off-Site Building | Site Boundary |
| Lost/Abandoned Monitoring Well | Diesel Pump          |                   |               |



**PROJECT NAME:** CALVERT CITGO  
**PROJECT ADDRESS:** 2815 NORTH EAST ROAD, NORTH EAST, MD  
**PROJECT NUMBER:** 005977  
**DATE:** SEPTEMBER 2014





**PROPOSED DEEP ZONE MONITORING WELL CONSTRUCTION**

