



October 1, 2014

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

**RE: Requested Documentation in Preparation for  
Regulatory Site Status Meeting**

Calvert Citgo  
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:

As requested by the MDE in the correspondence *Request for Meeting* letter dated August 12, 2014, this correspondence is being submitted by REPSG on behalf of the remediating parties for the above-referenced Site in advance of the regularity Site status meeting scheduled between the remediating parties, REPSG, and the MDE on October 6, 2014. Included in this correspondence is the following information:

- Proposed deep zone monitoring well location (a diagram is included as an attachment);
- Proposed deep zone monitoring well specification information;
- Drilling methodology for the proposed deep zone monitoring well;
- An outline and justification for testing to be conducted on the proposed deep zone monitoring well in order to determine viability; and
- Identification of wells to be used to monitor and measure connectivity between zones during packer testing of the proposed deep zone monitoring well.

### **Proposed deep zone monitoring well location**

REPSG recommends installing the proposed deep zone well within the property boundary of 2794 NE Road (the O'Brien residence) as this residence is currently occupied. A diagram depicting the proposed location of this well is included as an attachment to this letter.

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

The well shall be drilled, constructed, and tested for potability by a drilling firm and driller, both properly licensed in accordance with applicable Code of Maryland Regulations (COMAR). Drilling methods will conform to COMAR including, but not limited to Regulations Nos. 26.04.04.07 and 26.04.04.09.

The well will be installed in two (2) phases:

#### **Phase 1**

- 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 hole will be drilled with a nominal 10-inch diameter to the depth of competent bedrock, estimated to be between 90 to 100 feet below grade. A 10-inch steel casing will be installed, keyed into the bedrock. The casing will be grouted in place to seal off groundwater infiltration from upper, unconsolidated, zones.
  - The bottom hole will be drilled with a nominal 6-inch diameter, through the steel casing, from the bottom of the casing to a terminal depth of approximately 300 fbg. The borehole will be left, temporarily, as an open hole pending completion of the testing described herein.
  - Yield/potability testing of the well will be conducted on the various zones in the bedrock identified during drilling as highly fractured and/or significantly water bearing. Methods are described in the "Viability Testing" section, below.

#### **Phase 2**

- Based on the results of the yield/potability testing, REPSG may authorize the drilling firm to complete the wells for potable water use, including:
  - 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;
  - Installing 30 feet of 4-inch PVC screening at the final pumping depth interval, estimated to be at 270 to 300 fbg;

- Provide for isolation of the selected pumping zone, using grouting in the annulus between the well bore and the inner casing;
- Specify submersible well pump, for approval by the client. Procure and install the well pump and tubing;
- Install pitless adapter and above-grade wellhead completion; and
- Plumb well discharge to existing water intake/water treatment system of the residence.

### **Drilling Methodology for Proposed Deep Zone Monitoring Well**

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, solid 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.

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.

### **Outline and Justification for Viability Testing**

The deep zone investigation, as presented in the *Proposed Interim Remedial Measures* (PIRM) will include the collection of groundwater samples collected and sampled from each of the potential viable aquifer zones. Samples will be collected using methods approved by the MDE in order to isolate the sampled water from other aquifer zones.

The selected drilling firm shall propose the method to identify the depth intervals in the well bore that represent highly fractured zones and/or zones considered likely to yield significant water, at depths greater than 120 fbg. The methods may include observation of drill cuttings and/or a post-drilling downhole imaging or geophysical logging method.

Up to four (4) of those zones will be tested by the selected driller for potability, including yield, in accordance with COMAR Section 04.09. The testing will include isolating the zones to be tested, using packers or other acceptable methods. Each potability test will result in collection of water samples, which will be transferred to REPSG (under Chain of Custody) for laboratory analyses.

**Wells to be Used to Measure Connectivity Between Zones During Packer Testing**

During the viability testing the nearest identified aquifer zones, both above and below the tested zone, will be monitored in order to measure connectivity between those zones and the pumped zone. These zones will be measured within the test well, by use of pressure transducers above and below the straddle packer system.

**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

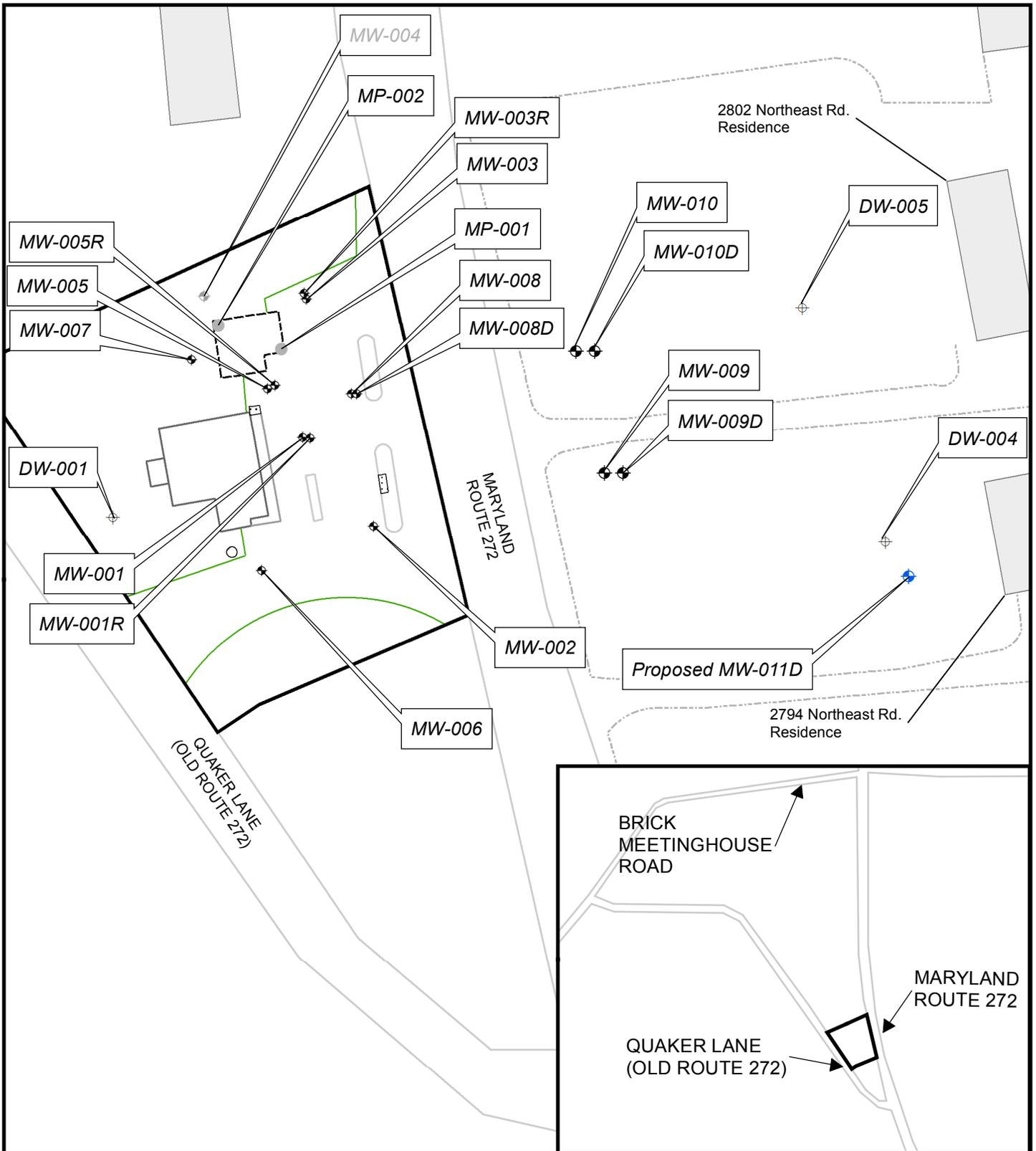


Brenda MacPhail Kellogg  
Senior Project Manager

**React Environmental Professional Services Group, Inc**

*Enclosures*

*cc: Susan Bull, Case Manager, MDE*



**Monitoring Well Locations**

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

**REPSG**  
 React Environmental  
 Professional Services Group, Inc.

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

