



October 6, 2013

Ms. Susan Bull
Maryland Department of the Environment - Oil Control Program
1800 Washington Boulevard, Suite 620
Baltimore, Maryland 21230-1719

Re: **Deep Well Discrete Groundwater Sampling - DRAFT
HydraSleeve Standard Operating Procedures
Royal Farm Store #96
500 Mechanics Valley Road, North East, Maryland 21901
Case No. 2011-0729-CE
Facility I.D. No. 13326
AEC Project No. 05-056**

Dear Ms. Bull:

Advantage Environmental Consultants, LLC (AEC) has completed this standard operating procedure (SOP) for testing discrete intervals of the groundwater column in the deep wells at Royal Farms Store #96 using HydraSleeve technology.

The HydraSleeve groundwater sampler will be used to collect a groundwater sample without purging the well. It collects a water sample from a defined interval, without mixing water from other intervals. The HydraSleeves are placed within the monitoring well, and a period of time is allocated for the well to re-equilibrate. After equilibrium the HydraSleeve is activated for sample collection. The HydraSleeve collects a sample with no drawdown and minimal agitation or displacement of the water column. Once the sampler is full, the one-way reed valve collapses, preventing mixing of non-representative water during recovery. The following are standard operating procedures for the deployment and collection of the HydraSleeve samplers.

- **Assembly** - Remove HydraSleeve from package and grasp top to “pop” open. Squeeze side fins together at top to bend reinforcing strips outward. Attach line to hole at top of HydraSleeve. Fold the two holes at bottom of HydraSleeve together and attach weight. Sampler is then ready to insert into the well.
- **Tether Attachment** - Multiple (3 or more) samplers will be attached to a tether for support to prevent the sampling string from pulling apart. The weight will be attached to a single length of suspension line and allowed to rest on the bottom of the well. The top and bottom of each HydraSleeve will be attached to the tether at the desired sample intervals. Cable tie or stainless steel clips will be used for attaching the HydraSleeves to the line. Dedicated sampling reels will be

used at each well to ensure that the sampling intervals are consistent between sampling events.

- Deployment Time** - The manufacturer's literature does not specify a deployment time for the HydraSleeve. AEC performed this type of testing in the last event in July 2013 using a one hour deployment time. The upcoming testing event will use a 24 hour deployment time. Based on a comparison of these results with the two previous sampling events, one of which used low-flow sampling procedures (January 2013), a decision will be made regarding the final deployment time (i.e., one hour or 24 hours). At that time this SOP will be finalized.
- Collection** - The HydraSleeve will be moved upward at a rate of one foot per second or faster (about the speed a bailer is usually pulled upward) for water to pass through the check valve into the sample sleeve. The total upward distance the check valve must travel to fill the sample sleeve is about 1 to 2 times the length of the sampler. The upward motion can be accomplished using one long continuous pull, several short strokes, or any combination that moves the check valve the required distance in the open position.
- Sample Discharge** - Squeeze the full sampler just below the top to expel water resting above the flexible check valve. Then, push the pointed discharge tube through the outer polyethylene sleeve about 3-4 inches below the white reinforcing strips. Discharge the sample into the desired container. Raising and lowering the bottom of the sampler or pinching the sample sleeve just below the discharge tube will control the flow of the sample. The sample sleeve can also be squeezed, forcing fluid up through the discharge tube.

The following table describes the proposed sampling interval depths. They are the same as used during the last HydraSleeve sampling event in August 2013.

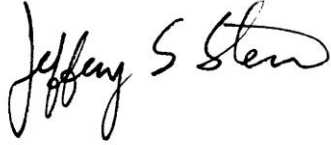
Well ID	Proposed Sampling Depths (ft)
MW-10D - (CE-10-0216)	25-29.5 89-94 185-190
MW-12D - (CE-10-0217)	41-46 70-75 95-100 145-150
MW-13D - (CE-10-0215)	37-42 135.5-139.5

The monitoring well samples will be analyzed for volatile organic compounds (VOCs) including fuel oxygenates per EPA Method 8260, Total Petroleum Hydrocarbons (TPH) Gasoline Range Organics (GRO) and TPH Diesel Range Organics (DRO) per EPA Method 8015B.

If you have any question regarding this information, or if we can be of further assistance, please contact AEC at (301) 766-0500.

Sincerely,

ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC

A handwritten signature in black ink that reads "Jeffery S. Stein". The signature is written in a cursive style with a large, stylized "J" and "S".

Jeffery S. Stein
Project Manager