Groundwater & Environmental Services, Inc.
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Odenton, MD 21113
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December 13, 2023

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

Re: **DELINEATION MONITORING WELL IINSTALLATION WORK PLAN**
Drake Petroleum
Bel Air Xtra Fuels
2476 Churchville Road, Bel Air Maryland
MDE Case No. 2013-0007-HA and 2011-0112-HA

Dear Ms. Bull:

Groundwater and Environmental Services, Inc. (GES), on behalf of Drake Petroleum Company, Inc. (Drake), is submitting this Delineation Well Workplan for the above referenced Site in response to the Maryland Department of the Environment (MDE) Request for Additional Activities letter dated August 29, 2023 (**Attachment A**). The MDE letter requested additional investigation points to assess the vertical delineation of petroleum contamination on-site, and horizontal and vertical delineation of petroleum contamination between MW-21 series monitoring wells and the intersection of Campus Hills Drive and Churchville Road.

Following MDE approval of this work plan, GES or the driller will submit monitoring well permits within 30 calendar days. Drilling activities will be scheduled pending driller availability following approval of monitoring well permits and a signed access agreement from the off-site property owner granting permission for well installation and sampling activities. GES will advise the MDE and the property owner at least five days in advance of the commencement of onsite drilling activities.

Delineation Monitoring Well Installation

GES will install three (3) new groundwater monitoring wells. One (1) clustered pair of two (2) groundwater monitoring wells (tentatively MW-22S and MW-22I) are to be located near the intersection of Campus Hills Drive and Churchville Road, approximately 240 feet west of the MW-21 series. One (1) groundwater monitoring well (tentatively MW-23I) will be located onsite approximately 20 feet southwest of MW-7R. The proposed locations are shown on **Figure 1**. Exact locations of the three monitoring wells will be confirmed following public and private mark-outs to confirm the proposed locations are at least ten (10) feet from all utilities, access

agreements have been signed granting permission to drill in these locations and any applicable right- of- way permits have been granted.

The shallow groundwater monitoring well, MW-22S, will be installed via hollow stem auger and the two intermediate groundwater monitoring wells, MW-22I and MW-23I will be installed via air rotary.

The "cluster" pair of proposed offsite monitoring wells (MW-22S and MW-22I) will consist of one (1) shallow overburden monitoring well and one (1) intermediate depth monitoring well. The onsite groundwater monitoring well will be an intermediate well, MW-23I. The shallow and bedrock wells within the cluster will be installed approximately 5-7 feet horizontally apart. The shallow off-site groundwater monitoring well, MW-22S, will be installed at a depth equivalent to the on-site groundwater monitoring wells, to a depth of ten (10) feet below first groundwater. The two (2) intermediate groundwater monitoring wells (MW-22I and MW-23I) will be drilled to an expected depth of approximately 80 feet below ground surface which is the depth of existing intermediate monitoring well MW-21I or at the depth to which the rock and schist overburden interface is reached.

During the installation of the proposed groundwater monitoring wells, GES will oversee continuous soil sampling utilizing either two (2) foot split spoons or 5 foot acetate sleeves in the shallow groundwater monitoring well MW-22S. In intermediate groundwater monitoring well, MW-22I soil sampling will begin at the depth where MW-22S ended and continue every five (5) feet using a two-foot split spoon until the tool can no longer be advanced. Continuous soil sampling from ground surface to refusal will be completed for monitoring well MW-23I. Hammer blows will be recorded in the format of number of blows per six (6) inch advancement as part of the permanent log records. Each recovered spoon will be examined by an on-site GES scientist and described to note percent recovery, lithology, color and moisture and will then be screened with a properly calibrated photoionization detector (PID). Soil samples will be retained from the depth eliciting the highest PID reading or at approximately one (1) foot above the static water level for laboratory analysis. All soil samples will be placed in laboratory supplied glassware and placed on ice in a cooler, then transported under a Chain of Custody to SGS North America Laboratories (SGS) of Dayton, New Jersey, a Maryland certified laboratory. Soil samples will be analyzed for the full suite of volatile organic compounds (VOCs) including fuel oxygenates, in accordance with United States Environmental Protection Agency (USEPA) Method 8260 and total petroleum hydrocarbons (TPH) gasoline range organics (GRO) and TPH diesel range organics (DRO) in accordance with USEPA Method 8015B.

Monitoring well MW-22S is expected to be constructed as a 2" diameter PVC monitoring well with 0.10" slot screen interval from 10 to 30 feet below grade. #1 sand pack will be placed in the 8" borehole from the bottom of the well annulus to approximately 8 feet below grade (2 feet above the top of well screen). Choker sand (#0) will be placed in the annulus above the #1 screen from 7 to 8 feet below grade. The remaining annulus around the monitoring well will be

filled with hydrated bentonite/cement from 0.5 to 7 feet. The monitoring well will have a locking gripper plug and be finished with a steel bolt down manhole in a 2X2 foot concrete pad.

Construction of MW-22I and MW-23I are proposed to be completed as 2" diameter PVC monitoring well within a 10" diameter borehole. Both monitoring wells are planned to have 15 feet of 0.10" slot screen interval from 65 to 80 feet below grade and solid PVC well casing to the surface. #1 well sand will be placed in the borehole annulus from 63 to 80 feet below grade with #0 choker sand from 62 to 63 feet below grade. A cement/ bentonite grout slurry will be pumped via a tremie-pipe from 0.5 to 62 feet below grade. The completed MW-22 I and MW-23I monitoring wells will be capped with a locking gripper plug and finished at grade with a 2 x 2 ft concrete pad and a steel flush-mount manhole cover assembly. Final monitoring well construction specifications will be determined following geophysical data and analysis.

Monitoring well development will be performed by a Maryland licensed driller under the supervision of a GES scientist. The general procedure would include pumping until the groundwater runs clear, then surging by agitating the pump, followed by a second round of pumping until the groundwater runs clear. Once the groundwater monitoring wells have been installed and developed the locations will be surveyed for top of casing elevation.

Groundwater Sampling

Approximately two (2) weeks following the installation of the new groundwater monitoring wells, the monitoring wells will be sampled for full suite VOCs, including fuel oxygenates, in accordance with USEPA Method 8260, TPH GRO and TPH DRO in accordance with USEPA Method 8015B. Groundwater samples will be collected utilizing a new disposable bailer and/ or a pump with dedicated tubing and the groundwater monitoring wells will be purged three (3) volumes prior to groundwater sampling. Groundwater samples will be shipped under proper chain of custody to SGS of Dayton, New Jersey for analyses.

Waste

All soil and groundwater generated during monitoring well installation and development will be containerized and transported off-site for proper disposal.

Geophysics

GES will conduct a down-hole geophysical survey after the installation of the two (2) intermediate boreholes. The geophysical survey will evaluate bedrock structure, orientation and potential water bearing zones. Results of the geophysical tests will influence the specific construction of the intermediate wells and the selection of potential discrete screen zones placed within these wells. GES will provide a summary correspondence of geophysical results and proposed final well construction specifications for MW-22I and MW-23I to the MDE to receive concurrence prior to monitoring well installation.

The geophysical survey will log:

- ***3-Arm Caliper*** (CAL or 3ACS): Records borehole diameter.

- ***Fluid Temperature*** (T): Records water temperature.

- ***Fluid Conductivity***: Records electrical conductivity of groundwater, and can identify and discriminate between different water-bearing zones if the total dissolved solid (TDS) or ionic content of the water in the two (2) zones is different.

- ***Natural gamma***: Records clay content of the formation(s), and can therefore detect clay-enriched soils and saprolite, weathered fracture zones, and hydrogeological boundaries.

- ***High-Resolution Acoustic Borehole Televiewer (HRAT) or Optical Borehole Televiewer (OPTV)***: Records an accurately-scaled image of the borehole walls, allowing identification of features such as fractures and solution openings, and semi-quantitative estimation of fracture orientation and thickness using visible light (optical) or sonar pulses (acoustic).

- ***Heat Pulse Flowmeter (HPFM)***: Records the rate of vertical water flow at depth intervals in a boring. A flowmeter is used to record the vertical flow rate at selected depths in a borehole, as well as the magnitude and direction of flow (up/down). Flowmeter data can often be used to determine which fractures may be conduits for water (into or out-of a well), as well as their relative water production rates.

Report

Following the installation of the three (3) groundwater monitoring wells, GES, on behalf of Drake, will submit a Monitoring Well Installation and Downhole Geophysical Summary Report. The report will summarize soil boring activities, monitoring well installation specifications, soil and groundwater analytical results, and downhole geophysical characterization. Following analysis of soil and groundwater results, GES will evaluate the need to install a deep bedrock well within the MW-22 cluster and at the MW-23 locations, per MDE request.

GES and Drake look forward to your written response to this MDE directed work plan. If you have any questions or require additional information, please contact the undersigned at (800) 220-3606 extension 3740 or 410-608-6164, respectively.

Sincerely,

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.

Scott Andresini
Senior Project Manager

Andrea Taylorson-Collins
Principal Project Manager

Attachment

cc: Lindley Campbelll, MDE –via e-mail and two hard copies
Brian Phipps, Hartford County Health Department – via email
Rowan Weber, Hartford County Health Department – via email
Tony Rubino, Drake Petroleum Compnay, Inc –via e-mail
Florence Rosen, President, Campus Hills Mgmt. Inc., Rosen Assoc. Mgmt. Corp. (florencer@rosenmgmt.com)– via e-mail
Gray & Associates, Richard Gray (richard@grayassoc.com) – via e-mail
Whiteford, Taylor & Preston, M. Trent Zivkovich TZivkovich@wtplaw.com) –via e-mail

GES PSID#1004679

Maryland
Department of
the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary
Suzanne E. Dorsey, Deputy Secretary

August 29, 2023

Mr. Jeff McCullough
Global Partners LP
Environmental, Construction and Compliance
800 South Street, Suite 500
Waltham, MA 02454

Ms. Florence Rosen
Rosen Associates Management Corporation
33 South Jericho Road
Jericho, NY 11753

Mr. Richard Gray
Gray & Associates LLC
1997 Annapolis Exchange Parkway, Suite 300
Annapolis, MD 21401

RE: REQUEST FOR ADDITIONAL INFORMATION
Case No. 2011-0112-HA
REF-OCP-2016-012
Bel Air Xtra-Mart No. 7805
2476 East Churchville Road, Bel Air
Harford County, Maryland
Facility I.D. No. 12391

Dear Mr. McCullough, Ms. Rosen, and Mr. Gray:

The Maryland Department of the Environment's (MDE) Oil Control Program (OCP) completed a review of the case file for the above-referenced property, including the *Site Status Report: First Quarter 2023*, dated May 5, 2023, and prepared by Groundwater & Environmental Services, Inc. (GES). A *Settlement Agreement and Consent Order*, under OCP Case Nos. 2011-0112-HA and 2013-0007-HA, was executed on October 11, 2016 (Consent Order). Between November and December 2016, all fueling operations at this facility ceased with the removal of five underground storage tanks (USTs), all associated dispensers and piping, and 1,338.62 tons of petroleum-impacted soil.

The monitoring well network consists of 17 monitoring wells (6 on-site, 1 well pair off-site, and 3 well clusters off-site), of which 7 monitoring wells are sampled on a quarterly basis, 3 on a semi-annual basis, and 7 on an annual basis. The most recent groundwater samples were collected in February 2023 and analyzed for full-suite volatile organic compounds (VOCs), including fuel oxygenates and naphthalene, using EPA Method 8260 and total petroleum hydrocarbons - diesel and

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gasoline range organics (TPH-DRO and TPH-GRO) using EPA Method 8015. The following petroleum constituents were detected above the State action levels:

- Benzene ranging from 7.7 to 35.7 parts per billion (ppb) in MW-16S, MW-16I, and MW-21S;
- Ethylbenzene at 1,400 ppb in MW-7R;
- Methyl tertiary-butyl ether (MTBE) ranging from 382 to 3,380 ppb in MW-16S, MW-16I, MW-21S, MW-21I, and MW-21D;
- TPH-DRO at 4,270 ppb in MW-7R; and
- TPH-GRO ranging from 519 to 14,400 ppb in MW-7R, MW-16S, MW-16I, MW-21S, MW-21I, and MW-21D.

Although the facility is served by municipal water, adjacent properties utilize private drinking water supply wells. Off-site monitoring of select private drinking water wells continues as directed by OCP. In the *Site Status Report: First Quarter 2022,* dated May 6, 2022, GES on behalf of Drake Petroleum requested a reduction in sampling frequency of monitoring well MW-14 from a quarterly to annual basis, the MW-17 series from a semi-annual to annual basis, and to stop sampling the 2303 Churchville Road property supply well. The OCP understands that GES, on behalf of Drake, is currently working on a plan to further assess the water quality for the property located at 1 Meadow Spring Drive.

Based on the current land use and the available information reviewed for this case, the OCP has the following requirements:

1. The OCP approves the reduction in sampling for monitoring well MW-14 from a quarterly basis to a **semi-annual basis**.

2. Continue sampling monitoring well MW-17 series and the 2303 Churchville Road property supply well on a **semi-annual basis**, until otherwise approved in writing.

3. A selection of commercial and residential properties in the vicinity were previously sampled under this open case. The current conditions of the following wells must be confirmed.

   a. **No later than October 30, 2023,** collect supplemental drinking water samples from the following property supply wells: 2317 Churchville Road, 2319 Churchville Road, 2401 Churchville Road, 2401A Churchville Road, 3 Meadow Spring Drive, 5 Meadow Spring Drive, 7 Meadow Spring Drive, 9 Meadow Spring Drive, and 10 Meadow Spring Drive.

   b. The samples must be analyzed for full-suite VOCs, including fuel oxygenates and naphthalene, using EPA Method 524.2. **No later than November 30, 2023**, submit copies of all sampling results to the property owner, tenant (if applicable), the Harford County Health Department, and the OCP case manager, Ms. Lindley Campbell.

   c. The OCP will contact the property owners for the selected supply wells identified for sampling to inform them of the sampling requirement.

4. Continue to submit groundwater monitoring reports as required by the Consent Order and previous MDE directives.

5. **No later than October 16, 2023**, submit a *Work Plan* for additional investigation points to assess the vertical delineation of petroleum contamination on-site, and horizontal and vertical delineation of petroleum contamination between the MW-21 series and the intersection of Campus Hills Drive and Churchville Road. At minimum, the *Work Plan* must include the installation of an intermediate depth monitoring well on-site and the installation of shallow and intermediate multi-level monitoring wells in the identified off-site location. If contamination is found, evaluate the need to install deep bedrock monitoring wells.

When submitting documentation to OCP, provide three hard copies and one electronic copy. If you have any questions, please contact Ms. Lindley Campbell at 410-537-3387 (lindley.campbell1@maryland.gov) or me at 410-537-3499 (susan.bull@maryland.gov).

Sincerely,

Susan R. Bull, Division Chief
Remediation Division
Oil Control Program

cc: Ms. Andrea Taylorson-Collins, Groundwater & Environmental Services, Inc
Mr. M. Trent Zivkovich, Whiteford, Taylor & Preston LLP
Mr. John Resline, Acting Director of Environmental Health, Harford County Health Dept.
Julie Kuspa, Esquire, Office of the Attorney General
Ms. Lindley Campbell, Case Manager, Remediation Division, Oil Control Program
Mr. Christopher H. Ralston, Program Manager, Oil Control Program

LEGEND

- MONITORING WELL
- POTABLE WELL
- ABANDONED MONITORING WELL
- PROPOSED MONITORING WELL

Proposed Monitoring Well Location Map

Bel Air Xtra Fuels
2476 Churchville Road
Bel Air, Maryland

Drawn
E.V.
Designed
J.S.
Approved
A.T.C.

Date
12/11/23
Figure
1

Scale In Feet
0 (Approximate) 80

Groundwater & Environmental Services, Inc.

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