

July 17, 2013

Mr. Christopher Ralston
Program Administrator
Oil Control Program
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230-1719

Re: Chester River Hospital Center
Close Out Process
Project No: 13402.00
MDE Case No. 1987-2534-KE
Facility ID No. 3168

Dear Mr. Ralston:

This is to confirm our recent conversations regarding the status of the cleanup process and proposed close out of the Chester River Hospital Center groundwater contamination case. As you know, for the past year and pursuant to Chester River Hospital Center's (CRHC) request, Earth Data has been overseeing the comprehensive groundwater monitoring program. This effort was initiated after twenty (20) plus years of groundwater pump and treat operations, as upgraded over time, and consisting of seven (7) recovery wells and a filtration system with a series of pre-filters and Mycelex filters followed by discharge to an onsite storm sewer. The remediation effort through 2012 had resulted in recovery of 83,452 gallons of fuel oil. Following this twenty (20) year recovery process, MDE agreed in 2012 that the free product effort had effectively reached an end point and that CRHC could, at their request, proceed with the close out process as outlined in MDE Regulation and Policy.

As part of the close out process CRHC, through Earth Data, shut down the pump and treat operation and implemented a very comprehensive monitoring program using proposed protocols. This program includes testing for many chemical constituents based on agreements reached with MDE as to the type of samples and duration of monitoring required over a full twelve (12) month period. On May 8, 2012 MDE directed a letter to CRHC which provided a complete review of the case file and documented in detail the projects progress from the initial oil spill, through cleanup operation. This letter also addressed CRHC's request in April, 2012 to shut down the recovery system and proceed with an established post-remedial monitoring plan.

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This letter further identified the post remediation monitoring plan to include:

- Monthly gauging of the entire monitoring network
- Quarterly sampling of all wells that do not exhibit LPH
- Targeted recovery of detected LPH via hand bailing and use of absorbent materials, and
- Quarterly reporting

The May 8, 2012 MDE letter also indicated "If at any time during this monitoring period any dissolved phase hydrocarbons are detected in any of the down gradient monitoring wells located across Brown Street (MW16, MW19, MW33, MW34, or MW35) the system must be reactivated." The MDE as part of the May 8, 2012 letter approved the written request for system shut down and the Draft Post Corrective Action Monitoring Plan.

To fill a gap in the groundwater monitoring network beneath the parking area south of Brown Street, Earth Data installed three (3) new monitoring wells (MW48, MW49, and MW 50) in March, 2013. The three (3) new monitoring wells were gauged and sampled each month during the last quarter (April, 2013 to June, 2013) of the post corrective action monitoring plan. During the period from June, 2012 to April, 2013 the collected samples and laboratory results were as expected and everything indicated the cleanup had been successful. It was believed that after the last quarter of monitoring an updated site assessment of the required seven (7) factors would have led to the final close out.

However, in June of 2013 very low levels (at or near the levels of detection) for TPH-DRO were found in eight (8) of seventeen (17) down gradient monitoring wells (including MW 16, MW19, MW34, and MW35) as documented in Earth Data's June, 2013 Post Corrective Action Quarterly Monitoring Report. The remediation system was immediately reactivated on June 14th. To confirm the presence of TPH-DRO in the down gradient monitoring wells, all wells south of Brown Street were resampled for TPH-DRO. The results of these samples indicated detectable levels of TPH-DRO in the same wells as the earlier samples but at considerably lower concentrations. Furthermore, we requested the lab to analyze the samples at a lower quantitative limit. The results showed very low (0.044 mg/L and 0.040 mg/L) but detectable levels of TPH-DRO in MW18 and MW23.

It is the collective opinion of the CRHC Consultant Team that the reactivation of the remediation system had the effect of lowering the water-table elevation in the vicinity of the down gradient monitoring wells where TPH-DRO had first been found allowing these dissolved organics to be adsorbed by the upper soil strata, which then resulted in lower concentrations in the collected samples.

These observations matched the Consultant Team's theory that these trace amounts of dissolved chemicals are associated with adsorption of TPH to the soils when fluctuating water tables are lower with reintroduction into the water column when the water table is elevated. Sorption effects limit the availability of contaminants for physical, chemical, and biological remediation. It can count for ninety percent (90%) or more of the total contaminant mass at a site. Hence Hydrophobic Organic Chemicals (HOC's) (free phase, dissolved, and/or sorbed) can persist in soils, sediments, and fractured bedrock for extended periods of time. This explains why some remediation projects are slow, costly, and/or fail to achieve their remediation objectives.

For these reasons, and in order to effectively complete the cleanup, protect the local water supply, and to be able to efficiently close out the project, CRHC is recommending a new "clean up step" to complete the process.

We are proposing to:

1. For the period of July 1st through August 30th, continue the pump and treat process, continue monthly gauging and sampling of the eleven (11) down gradient monitoring wells (MW15, MW16, MW19, MW20, MW24, MW33, MW34, MW35, MW48, MW49, and MW50) for TPH-DRO only. We will submit monthly progress reports that include gauging summary tables and the results of the targeted supplemental wells samples.
2. Starting September 1, 2013 turn off the pump and treat system and allow the water table to rise so that adsorbed dissolved chemicals can be re-entrained into the water column.
3. Starting mid-September through mid-October, engage Ivey International to use their patented Ivey-sol Surfactant Enhanced Remediation (SER) "Push-Pull" application to remove residual free phase product, dissolved phase, and any associated sorbed phase with the soil and groundwater regimes with particular focus on the smear zone associated with groundwater elevation fluctuations over time.
4. Following the completion of the Ivey-Sol "Push-Pull" application, perform monthly gauging of all wells and perform monthly sampling at the eleven (11) down gradient wells (MW15, MW16, MW19, MW20, MW24, MW33, MW34, MW35, MW48, MW49, and MW50) for TPH-DRO only. We will continue to submit monthly progress reports that include gauging summary tables and the results of the targeted supplemental wells samples.
5. Earth Data would be responsible for providing the labor associated with overseeing the pump and treat operation for the period specified above and for labor as needed during the "Push-Pull" application to the treat fuel oil contamination as described above under Ivey International's supervision.
6. EBA Engineering, Inc. under the direction of Mr. Kunal Gangopadhyay, P.E. and his staff of licensed hydro-geologist/geotechnical engineers will provide the science, cleanup technical oversight, and provide MDE with all reporting through project closeout.
 - a. Includes direction and oversight of well sampling, laboratory monitoring, monthly/quarterly reports to MDE, and all required submittals/efforts related to the final cleanup operations and close out of case number 1987-2534-KE.
 - b. Overseeing third party contractors (i.e. laboratory services and Earth Data services).
 - c. Phase Separation Science, Inc. will continue to function as the certified laboratory through project close out in order to provide continuity in lab testing during this final phase.

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This is merely an overview of CRHC's revised plan to complete the cleanup operation and to move forward with project closeout. The details of these various action items and amended cleanup processes are included in the proposed CRHC 2013 Action Plan. In the Action Plan the roles of the various consultants, the various processes and procedures to be followed, and timeframes/milestones are identified.

We look forward to working with the MDE in what we hope to be the final phase of the groundwater remediation for this site.

Should you have any questions concerning this information or require any clarifications please contact me directly on 410.812.9109. Once you have had a chance to review the detail associated with our plans please call so that we can set up a meeting at your earliest convenience so we can discuss implementation steps.

Sincerely,

Daft-McCune-Walker, Inc.

Dane S. Bauer
Senior Vice President

Enclosures

Cc: Mr. Art Hilsenrad
Mr. Scott Burleson
Dr. Robert Summers
Mr. Kunal Gangopadhyay
Mr. Bud Ivey
Mr. Tucker Moorhead