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VIA ELECTRONIC MAIL

January 24, 2013
Revised: April 10, 2014

Ms. Ellen Jackson
Central Region Section Head, Remediation and State-Lead Division
Maryland Department of the Environment - Oil Control Program
1800 Washington Boulevard
Suite 620
Baltimore, Maryland 21230-1719

Subject: Case No. 91-2100-BA, Hess Gasoline Station No. 20204, Facility I.D. No. 545
Ridgely Manor Park Contingency Plan
Towson, Baltimore County, Maryland

Dear Ms. Jackson:

The groundwater collection system for the future Ridgely Manor Park was designed as a part of the Corrective Action Plan (CAP) and CAP Addendum approved by the Maryland Department of the Environment (MDE) in letters dated September 24 and November 22, 2013, respectively. A key function of the groundwater collection system is to contain residual gasoline downgradient of the Hess gasoline Station No. 20204 located at 1613 East Joppa Road in Towson, Baltimore County, Maryland. This contingency plan was prepared in response to the modifications of the CAP required by the CAP Addendum approval letter. The plan specifies actions that will be taken if future sampling shows that concentrations of gasoline constituents above specified standards are being discharged from the groundwater collection system into the storm sewer.

Background

The former homes constructed along Yakona Road are downgradient from the Hess gasoline Station. A French drain installed at the time of construction of the homes (circa early 1950's) was likely intended to prevent groundwater from entering the basements beneath the homes and to prevent seeps onto Yakona Road. The drain, located behind the former homes, discharged to the 24-inch diameter onsite storm sewer. Over time it is assumed that this French drain became plugged and/or damaged preventing it from operating as designed, which allowed groundwater to enter basements and seep onto Yakona Road. However, lesser amounts of groundwater continued to discharge to the storm sewer, which contained residual concentrations of gasoline.

Groundwater collected in sumps within the basements of the former residences was pumped to the roadway drainage and discharged through a curb inlet to the same storm sewer. The water within the former sumps also contained residual concentrations of gasoline, although at lower concentrations than the discharge from the French drain. The flow from both the French drain and the water discharged to the curb flowed into the same 24-inch storm sewer.

Based on sample data from the onsite monitoring wells provided by EMS Environmental, Inc. (EMS), it has been estimated that the concentrations of constituents of concern in the future groundwater collection system should be less than the following discharge standards:

- Benzene - 5 micrograms per liter ($\mu\text{g/L}$)
- Total Benzene, Toluene, Ethylbenzene, and Xylene (Total BTEX) - 100 $\mu\text{g/L}$
- Total Petroleum Hydrocarbons (TPH) - 15,000 $\mu\text{g/L}$

A subsurface vault will be installed in-line with the collection system. The vault will allow for the installation of treatment equipment if it is necessary based on the following contingency plan.

Contingency Plan

The groundwater discharging from the collection system shall be monitored at least one time per month in accordance with the Corrective Action Plan and the State discharge permit. In the event one or more parameters exceed the listed standards the following actions shall be taken:

Action 1. Notify MDE

The MDE Oil Control Program will be notified by electronic mail within 24 hours of receipt of final laboratory data showing an exceedance of the discharge criteria listed above. The email will include an electronic copy of the laboratory data.

Action 2. Evaluate the Potential Exceedance

As required by the MDE Oil Control Program, a confirmatory sample will be collected within 48 hours of the receipt of final laboratory data showing an initial exceedance of the discharge criteria listed above. If the 48-hour time frame falls on a weekend or holiday, the sample will be collected on the next regular business day. This confirmatory sample will be analyzed on a 48-hour turnaround time and the analytical results will be sent via electronic mail within 24 hours of receipt of final laboratory data. It should be noted that if a sample is submitted to the laboratory on a Friday, 48-hour turnaround will be on the following Tuesday.

In addition to the collection of a confirmatory sample, the data from the laboratory will be reviewed and the quality assurance/quality control (QA/QC) procedures shall be verified to ensure the data are representative of the flow from the system. If the data are considered valid, the specific compounds exceeding the listed criteria will be evaluated and compared to the monitoring well data for the Site. The results of the evaluation will be forwarded to the MDE Oil Control office.

Action 3. Discharge Sampling Schedule Change

If the analytical results from the initial sample and the confirmatory sample exceed the discharge criteria, the sampling schedule will be changed from one time per month to two times per month. The sampling frequency will revert back to monthly once two consecutive samples are below the discharge criteria. The following will be used as an example for the schedule change:

- Initial sample collected – Day 1
- Final analytical results received showing exceedance – Day 15
- Confirmatory sample collected – Day 17 (or the next regular business day)
- Final laboratory results of confirmatory sample received showing exceedance – Day 19

- Schedule changed to two times per month; next sample collected after Day 30
- Samples will be collected approximately every 15 days until at least two consecutive samples are below discharge criteria. At that point, sampling will return to one time per month

Action 4. Implementation of Treatment

If three consecutive samples are above the discharge criteria, a temporary treatment system will be installed within 60 days of the receipt of the third laboratory report. This treatment system will be contained within a weatherproof, subsurface vault and will consist of granular activated carbon (GAC) filtration of the groundwater prior to discharge. The system will be designed to treat the groundwater based on the chemical loading and the daily flow rate. A detailed description of the GAC system will be provided to the MDE Oil Control office during this 60-day period and prior to system startup.

Discharge samples will continue to be collected during the installation of the GAC treatment system. If final analytical results from two consecutive samples are below the discharge criteria, the GAC system will be installed but not operated. The installed system will be activated if there is another time when final analytical results show that three consecutive discharge samples are above the discharge criteria.

Action 5. Sampling Outfall, Monitoring Wells and Manholes

If the GAC treatment system is implemented (i.e., analytical results continue to show an exceedance during the 60-day installation period and the GAC system is activated), a round of samples will be collected from the outfall and each manhole in the system in an attempt to isolate the source of the exceedance. Data from the regular sampling of the monitoring well network will also be used for this Action. The MDE will be given 5 calendar days' notice of the date of the proposed sampling event. These samples will be collected no later than 30 calendar days after the startup of the GAC system. The data to be collected include:

- Estimated flow at each manhole
- Field parameters – water color, water odor, temperature, pH, dissolved oxygen (DO), specific conductance, turbidity, and oxidation/reduction potential
- Benzene, BTEX, and TPH

A brief letter describing the sampling and evaluation shall be submitted to MDE within 1 calendar week of receipt of the data from the laboratory. The letter will notify the MDE of the results of the sampling, provide a figure that includes the locations of the constituents in each sample (manholes and monitoring wells) and provide a schedule for the alternative analysis.

Action 6. Alternatives Analysis

An analysis of the sources and concentrations of the constituents exceeding the applicable discharge criteria will be conducted and an evaluation of the field parameters collected from each sample location will be performed while the GAC system is active. The analysis shall include:

- A summary of all data collected from the system;
- Trend analyses showing the changes (if any) in concentration across the data collection period;
- An analysis of the source(s) of the concentrations causing the exceedance;

- An analysis of the mass and concentrations in excess of the applicable discharge standards contrasted to the initial design criteria; and
- An alternatives evaluation of the possible remedies available and implementable for reduction of the concentrations in the discharge.

The alternatives analysis will be submitted to MDE within 60 calendar days of the receipt of laboratory analytical reports of the final data set from the outfall, monitoring wells, and manholes along the groundwater collection system. During this time, if analytical results from discharge samples show that it is necessary, the GAC system will continue to operate.

Action 7. Long-Term Groundwater Treatment Actions

Should analytical results show that, without treatment, the groundwater discharge will consistently be above the applicable criteria, a permanent treatment system will be designed and installed. WSP designed the groundwater collection system to accelerate the removal of residual gasoline constituents from the groundwater system below Ridgely Manor Park. The data available from EMS have been analyzed and indicate that the discharge criteria should not be exceeded. However, the groundwater collection system was designed to allow implementation of groundwater treatment (i.e., installation of a subsurface vault) without significant disruption to the park. The technologies that will be evaluated in the analysis include, but are not limited to:

- A. Weir Plates Installed within Manhole(s) – This alternative will be used for relatively low concentrations close to the discharge standards. The weir plates cause simple aeration within the system, which may be sufficient to lower concentrations. The system has sufficient grade to allow installation of several 12-inch high, v-notch weir plates that will provide a vertical drop and aeration within the manholes.
- B. Bioaugmentation Socks Installed in Manhole(s) – The introduction of additional nutrients and oxygen along the system should accelerate the breakdown of the organic compounds before they reach the outfall.
- C. Air Sparge in Manholes – The introduction of diffusers in the manholes prior to the discharge will allow transformation of the constituents from the liquid to the vapor phase and will accelerate breakdown.
- D. Bioaugmentation – Depending on the sources and concentrations of constituents of concern in the collection system, it may be appropriate to conduct in-situ bioremediation. This would likely consist of bench-scale, field-scale, and full-scale treatment if required. Treatment would likely be implemented using direct push technology to introduce the selected amendments into the groundwater.
- E. GAC Treatment – Although a temporary GAC system will be installed to treat groundwater within 60-days of a verified exceedance, a permanent GAC system may be the best alternative.

A detailed analysis of the available technologies will be conducted to determine the most feasible alternative available to meet the discharge criteria. The technologies will be evaluated against the seven risk factors included in the CAP and compared on the basis of the time required to implement, time required to achieve compliance, and the long-term effect on the site conditions. This analysis and a proposed permanent treatment system will be provided to the MDE Oil Control office for review and approval. Since several of the potential remedies require time sensitive analyses, the selected treatment will be implemented within 120 calendar days after MDE approval of the selected remedy.

Action 8. Continued Monitoring and Treatment System Operation

During the normal operation of the groundwater management system, the groundwater discharged to the storm sewer will be sampled and analyzed as described above. The sampling will continue during the implementation and operation of temporary and/or permanent treatment systems. If a treatment system is operating and is effective in reducing the chemicals of concern to below applicable criteria, discharge sampling will be conducted one time per month.

During the operation of the temporary and/or permanent groundwater treatment system, samples will be collected before and after treatment to ensure the system is effective and to monitor the groundwater management system. When final analytical results from two consecutive pre-treatment samples are below the treatment criteria, the treatment system will be bypassed or shutdown. The system will be restarted if three consecutive samples are above the applicable discharge criteria (Action 4).

Please feel free to contact us with any questions you may have regarding the contingency plan for the potential treatment of the discharge from the Ridgely Manor Park groundwater collection system. We look forward to your approval of this plan as we move forward to create the park and install our groundwater collection system.

Sincerely yours,



Keith E. Green
Vice President, WSP

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cc: Ms. Jenny Herman, MDE
Mr. Donald Bull, Hess Corporation
Mr. John Schenkewitz, Hess Corporation
Mr. Steve Leifer, Baker Botts LLP