Maryland
Department of
the Environment

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Ben Grumbles, Secretary
Horacio Tablada, Deputy Secretary

December 20, 2017

Mr. William Parry
Manager, Environmental Remediation
CSX Transportation, Inc.
One Bell Crossing Road
Selkirk NY 12158

RE: REMEDIAL RECOVERY and MONITORING PLAN APPROVAL
Case No. 1994-1379-FR
CSX Transportation Maintenance Yard
100 South Maple Avenue, Brunswick
Frederick County, Maryland

Dear Mr. Parry:

The Maryland Department of the Environment's (the Department) Oil Control Program (OCP) recently completed a review of the case file for the above-referenced property, including the *Site Conceptual Model (SCM) - Second Addendum*, dated January 17, 2017, the *Remedial Recovery and Monitoring Plan*, dated May 23, 2017, and the *Quarterly Report - Second Quarter 2017,* dated September 18, 2017. On July 7, 2007, the Department and CSX Transportation, Inc. executed a *Consent Order* to ensure that the following actions were performed: the complete delineation of the contaminant plume; the recovery of liquid phase hydrocarbons (LPH); and continued monitoring of the plume on site and off site. The *Consent Order* required the recovery of LPH to the maximum extent practicable, as determined by the Department, so there is no threat of migration, taking into consideration future re-watering of the C&O Canal. All approved supplemental investigative activities have been completed and the SCM - *Second Addendum* was submitted to the Department on January 16, 2017. This document refined the previously submitted *SCM* with additional subsurface assessment data and documented the following site-specific characteristics:

- Accumulating thicknesses of LPH in the monitoring/recovery well network have demonstrated a stable to decreasing trend.

- Overall LPH recovery rates have decreased to near asymptotic conditions. Updated transmissivity testing demonstrates a lower transmissivity rate than calculated in 2013, suggesting that continued remediation may be impracticable to further reduce the remaining contaminant footprint.

- The results of the transmissivity testing confirmed that LPH remain mobile at the pore scale in the interior of the plume; however, the overall LPH plume is stable and the LPH plume boundary has not expanded beyond the historical delineation limits.

- Natural Source Zone Depletion (NSZD) testing indicated detections of favorable levels of carbon dioxide (CO2) in the soils, which are attributable to the continued natural attenuation and degradation of the LPH plume.

- Results of the laser induced fluorescence (LIF) investigation confirmed the presence of LPH in the area of the site where it had previously been identified. The findings did not identify or redefine the previously defined LPH plume boundary.

- A Mann-Kendall statistical analysis of groundwater data from 38 monitoring wells demonstrated that monitoring wells located down-gradient of the source area exhibit a stable to decreasing trend with some exceptions, where no trend could be defined. In general, concentrations of total petroleum hydrocarbons –diesel range organics (TPH-DRO) were not increasing in any monitoring well with the exception of NPS MW-18, which presents fluctuations ranging from 0.08 to 0.41 parts per million (ppm).

- Some wells in the study area could not be evaluated via Mann-Kendall because groundwater data trends were non-detect for more than 50 percent of the time series record, or because there were variable concentrations in the recorded groundwater trend. However, these wells did not present an increasing trend or appear to be migrating.

- LPH have not been detected in any NPS well since September 2005.

Based on our review of the supplemental data, your environmental consultant updated the *SCM* and proposed to transition the site from current active remedial efforts (i.e., LPH recovery) to a management strategy, which focuses on the site-specific characteristics listed above and utilizes established long-term, risk-based management guidelines. Table 1 of the *Remedial Recovery and Monitoring Plan* summarizes the first step in this transition process. The OCP understands that this transition process will be continually refined as future site conditions warrant. Additional modifications will be based on data obtained from groundwater sampling, fluid level gauging, and the results of additional LPH transmissivity testing and supplemental natural source zone depletion assessment. The goal of the transition period activities is to develop a post-remedial, risk-based monitoring program for the site. The initial transition proposes the following:

- Reduce the overall number of wells gauged from 77 to 57 representative wells and gauging frequencies from monthly to quarterly.
- Reduce the overall number of wells sampled from 28 to 19 representative wells and the sampling frequencies from quarterly to semi-annually.
- Decommission the LPH skimmer systems and begin manual LPH recovery during the gauging events, as needed.
- Abandon five monitoring wells.

Based on our review, the OCP offers the following comments and approvals:

Transition Monitoring and Project Goals:

1) To ensure the continued transition of this case from post-remedial monitoring to closure, the Department requires annual project management meetings to occur in the fourth quarter of each year. During this meeting we expect your contractors to provide a technical presentation of any data collected during the year, discuss the status of the case, and provide and discuss plans for the upcoming year. It is the Department's expectation for the transition period to be completed within two years and a post-remedial monitoring phase is completed at least one year after initiation.

2) Future modifications to the *Remedial Recovery and Monitoring Plan* must be submitted in writing to the attention of the OCP case manager for written approval prior to implementation.

3) Continue to coordinate with the OCP and the Office of the Attorney General to make the necessary revisions to the site-specific *Corrective Action Plan* and the *Consent Order.*

4) The Department has modified Table 1 to reflect the approved *Post-Remedial Monitoring/Transition 1* site management schedule. Refer to enclosed Table 1, *Approved Rebound Assessment Monitoring Program.*

5) Based on the protracted recovery and monitoring at this site, the Department requires the following activities be completed:

   a) Prior to the collection of groundwater samples, redevelop all wells approved for semi-annual sampling (see Table 1).
   b) No later than second quarter 2018, redevelop all wells that continue to exhibit LPH (see Table 1).
   c) Active surging and pumping methods must be used to redevelop all wells. Vacuum trucks will not be permitted to be used for the redevelopment process. All liquids generated during the redevelopment process must be properly containerized for off-site disposal.
   d) If a chemical method is deemed necessary for use to aid in well redevelopment, a *Work Plan* with MSDS forms must be submitted to the OCP for our review and approval.

Department Approved Gauging and Monitoring Program:

6) A number of monitoring wells have not been included in the monitoring program (gauging or sampling) and they have not been proposed for abandonment. These wells must continue to be gauged quarterly until a proposal for abandonment or otherwise is submitted to the Department for consideration. See highlighted cells on Table 1 that reflect these amendments.

7) At this time, the OCP does not concur with the abandonment of extraction wells EW-6 and EW-7. These wells must be retained for continued quarterly gauging.

8) **No later than December 2017**, begin quarterly (every three months) gauging of the approved "gauging only" monitoring wells (see enclosed Table 1). Quarterly gauging will continue in March, June, September, and December of each year. Gauging data collected must be tabulated on time series tables, including depth to LPH (if present), depth to water, corrected groundwater

elevations as appropriate, and calculated LPH thicknesses. Tabulated data must also be presented in a graphical format representing the corrected groundwater elevations and LPH thicknesses, if applicable, with respect to time.

9) **No later than December 2017**, begin semi-annual (every six months) sampling of those wells approved for continued sampling (see enclosed Table 1). Semi-annual sampling will continue in March and September of each year. All samples collected must be analyzed for volatile organic compounds (VOCs) for the previously approved limited constituent data set including: benzene, toluene, ethylbenzene, total xylenes, methyl tertiary-butyl ether (MTBE), tertiary- butyl alcohol (TBA), tertiary-amyl methyl ether (TAME), di-isoproply ether, and ethyl tertiary-butyl ether using EPA Method 8260 and total petroleum hydrocarbons - diesel and gasoline range organics (TPH-DRO and TPH-GRO) using EPA Method 8015.

10) If a new occurrence of LPH is observed or there is an uncharacteristic increase in the amount of LPH observed relative to historic site data, report the findings to the Department within two hours of discovery by calling the OCP Baltimore Headquarters at 410-537-3442 during standard business hours, or the Emergency Response Division hotline at 1-866-633-4686. Reports should not be made solely to OCP case managers.

11) The OCP understands that skimmer and manual recovery of LPH will no longer occur in any well that presents a detection of LPH at a thickness less than 0.2 feet. These wells will continue to be monitored to determine LPH rebound rates.

12) The Department understands that additional transmissivity testing will be initiated in any well that exhibit LPH rebound thicknesses of greater than 0.2 feet. At that time, LPH will be recovered as part of the transmissivity testing protocols previously approved for the site. All recovered LPH must be quantified and tabulated on the established LPH recovery total tables in each quarterly report submitted. The LPH recovery trends must also be presented graphically.

13) The Department understands that natural source zone depletion testing will continue on a semi-annual (every six months) basis.

14) The Department anticipates receipt of the *Quarterly Monitoring Reports* no later than forty-five (45) days following completion of the approved gauging and sampling collections. *Quarterly Monitoring Reports* must include the results of all gauging and/or sampling events. When submitting reports, include data summary tables and scaled site maps showing actual sampling locations (i.e., monitoring well and tank field well locations). Reports should also include groundwater contour maps with flow direction, a LPH thickness map, a dissolve concentration map and qualitative and/or quantitative discussions.

15) During second quarter 2018, properly abandon monitoring wells MW-21, MW-31, and MW-50 under the direction of a Maryland-licensed well driller in accordance with all applicable requirements of Code of Maryland Regulations (COMAR) 26.04.04.34-36. Provide copies of the required well abandonment reports to the Oil Control Program (Attn: Mr. Nicholas Psenicnik) and the Frederick County Health Department (Attn: Mr. Barry Glotfelty) within 45 days of abandonment.

The OCP will continue to coordinate with CSX Transportation, Inc. and your environmental consultant regarding the timing and details of a long-term monitoring plan. As of January 2018, this case will transition to a new management team. The new case manager will be Mr. Nicholas Psenicnik and the new supervisor will be Ms. Ellen Jackson. If you have any questions, please contact me at 410-537-3499 or via email at: *susan.bull@maryland.gov*. For future reference, you may contact Mr. Psenicnik at 667-203-1016 (email: *nicholas.psenicnik@maryland.gov*) or Ms. Jackson at 410-537-3482 (email: *ellen.jackson@maryland.gov*).

Sincerely,

Susan R. Bull, Western Region Section Head
Remediation and State-Lead Division
Oil Control Program

SRB/EJ/nln

Enclosed: MDE Approved Rebound Assessment Monitoring Plan Table 1

cc: Jeremy Peterson, Esquire
Mr. Albert Buell (ARCADIS U.S. Inc,)
Mr. Barry Glotfelty (Frederick County Health Dept.)
Ms. Michelle Carter (National Park Service)
Matthew Zimmerman, Esquire
Mr. Andrew B. Miller
Mr. Christopher H. Ralston
Ms. Hilary Miller

MDE Approved Rebound Assessment Monitoring Program
Table 1
CSXT
Brunswick, Maryland

ARCADIS

Location	Current Fluid Level Gauging Program	MDE Approved Quarterly Gauging Program	Current Groundwater Monitoring Program	MDE Approved Semi-Annual Groundwater Monitoring Program	LPH Observed Historically	LPH Observed 4Q 2016	LPH Observed Greater than 0.2' Historically	LPH Observed Greater than 0.2' - 4Q 2016	MDE Approved Wells to be Decomissioned
CS-1	X	X			X				
CS-2	X	X			X				
CS-3	X	X			X				
CS-4	X	X							
CS-5	X	X							
EW-1	X	X			X				
EW-2	X	X			X				
EW-3	X	X			X	X	X		
EW-4	X	X			X				
EW-5	X	X			X		X		
EW-6	X	X							
EW-7	X	X							
MW-01	X	X			X				
MW-02	X	X			X		X		
MW-03	X	X	X	X					
MW-04R	X	X			X		X		
MW-05	X	X							
MW-06R	X	X	X	X	X				
MW-08	X	X							
MW-09	X	X							
MW-20	X	X							
MW-21	X								X
MW-22	X	X	X	X					
MW-23	X	X			X				
MW-24	X	X	X	X					
MW-25	X	X	X	X					
MW-26	X	X			X	X	X		
MW-27	X	X			X				
MW-28	X	X			X				
MW-29	X	X	X	X					
MW-30	X	X			X				
MW-31	X								X
MW-32	X	X			X	X	X		
MW-33	X	X			X				
MW-35	X	X							
MW-37	X	X			X	X	X	X	
MW-38	X	X			X	X	X		
MW-39	X	X			X				
MW-41	X	X			X	X	X	X	

MDE Approved Rebound Assessment Monitoring Program
Table 1
CSXT
Brunswick, Maryland

ARCADIS

Location	Current Fluid Level Gauging Program	MDE Approved Quarterly Gauging Program	Current Groundwater Monitoring Program	MDE Approved Semi-Annual Groundwater Monitoring Program	LPH Observed Historically	LPH Observed 4Q 2016	LPH Observed Greater than 0.2' Historically	LPH Observed Greater than 0.2' - 4Q 2016	MDE Approved Wells to be Decomissioned
MW-43	X	X	X	X					
MW-49	X	X			X	X	X		
MW-50	X								X
MW-51	X	X	X	X					
MW-52	X	X							
MW-53	X	X			X	X	X	X	
MW-54	X	X			X	X	X	X	
MW-55	X	X			X	X	X	X	
MW-56	X	X			X	X	X	X	
MW-57	X	X			X	X	X		
MW-58	X	X			X	X	X		
MW-59	X	X	X		X	X	X		
MW-60	X	X	X		X	X	X	X	
MW-61	X	X	X		X	X	X		
MW-62	X	X	X		X	X	X		
MW-63	X	X	X		X	X	X	X	
MW-64	X	X	X	X					
MW-65	X	X	X		X	X			
MW-67	X	X	X		X	X	X		
MW-68	X	X	X		X				
MW-69	X	X	X	X					
MW-70	X	X	X		X		X		
MW-71	X	X	X	X					
NPS MW-01	X	X	X	X					
NPS MW-02	X	X	X	X					
NPS MW-03	X	X							
NPS MW-04	X	X	X	X	X				
NPS MW-05	X	X	X	X					
NPS MW-10	X	X							
NPS MW-10	X	X							
NPS MW-11	X	X							
NPS MW-12	X	X							
NPS MW-13	X	X	X	X					
NPS MW-14	X	X	X	X					
NPS MW-15	X	X							
NPS MW-16	X	X	X	X					
NPS MW-17	X	X							
NPS MW-18	X	X	X	X					
Totals	**77**	**74**	**28**	**19**	**40**	**20**	**23**	**8**	**3**

Notes
LPH recovery well network is expected to change based on results of field testing performed during the recovery events.