



MARYLAND DEPARTMENT OF THE ENVIRONMENT

Oil Control Program, Suite 620, 1800 Washington Blvd., Baltimore MD 21230-1719

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Martin O'Malley
Governor

Robert M. Summers, Ph.D.
Secretary

Anthony G. Brown
Lieutenant Governor

February 10, 2012

Mr. Herbert M. Meade
Environmental, Health and Safety Director
Carroll Independent Fuel Company
2700 Loch Raven Boulevard
Baltimore MD 21208

RE: CORRECTIVE ACTION PLAN (CAP) APPROVAL

Case No. 2005-0834-FR

Green Valley Citgo

11791 Fingerboard Road, Monrovia

Frederick County, Maryland

Facility I.D. No. 11836

Dear Mr. Meade:

The Oil Control Program recently completed a review of the case file for the above-referenced property, including the *Extended In-Situ Chemical Oxidation (ISCO) Pilot Testing - Comprehensive Summary Report - December 19, 2011*. In June 2011, the Department approved extended pilot testing activities to further evaluate the use of in-situ chemical oxidation (ISCO) technology at the subject location. At that time, the Department required additional sampling of the six impacted off-site private drinking water supply wells (3990, 3992, 3994, 3996, 3997 Farm Lane and 3923 Rosewood Road) and two on-site public supply wells (FR-94-1233 and FR-94-1281). According to the *Comprehensive Summary Report*, the ISCO system was operational for 51 days and culminated with the subsurface injection of 167 pounds of ozone and over 15 pounds of hydrogen peroxide in the vicinity of the active underground storage tank (UST) system. During this time period, sampling of the monitoring well network and the off-site private drinking wells supply wells continued to demonstrate an overall stabilized to decreasing trend in the concentration of dissolved phase petroleum constituents.

After a review of the extended pilot test data, your environmental consultant recommended continued operation of the ISCO injection system for three months. During this period, the Department understands that Carroll Independent Fuel Company (CIFCO) will continue to monitor the on-site monitoring well network, including the two public supply wells, and the off-site drinking water supply wells as previously approved in

the Department's *Approval of Corrective Action Plan Implementation and Extended Pilot Testing - August 24, 2011* letter (copy enclosed). The Department understands that additional investigative activities will be proposed under separate cover to further evaluate site characteristics and provide for enhancement to the ISCO injection system.

Based on our review of the information provided in the *Extended ISCO Pilot Testing - Comprehensive Summary Report*, the Department hereby approves restarting the ISCO injection system for a three-month period contingent upon the following modifications:

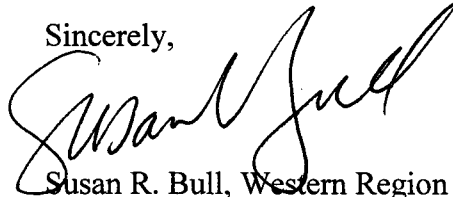
- 1) Continue **weekly** operation and maintenance inspections of the ISCO injection system and record all data necessary to evaluate the performance of the ISCO system (e.g., ozone injection rate; ozone and air flow rates; hours/days of operation; volume of hydrogen peroxide injected; soil vapor extraction data), as provided in Table 1 of the *Extended ISCO Pilot Testing - Comprehensive Summary Report*.
- 2) Continue **weekly** evaluations of monitoring wells MW-13, MW-15D, MS-18S, and MW-18D and **biweekly (every other week)** evaluations of monitoring wells MW-7, MW-8, MW-10, MW-14S, MW-14D, MW-16, and MW-17. These evaluations are necessary to monitor for changes in groundwater conditions, including elevation, temperature, dissolved oxygen, oxidation reduction potential, conductivity, pH, headspace pressure, and percent oxygen and ozone concentrations.
- 3) Continue quarterly (**every three months**) sampling of the entire monitoring well network. All groundwater samples collected during quarterly events must be analyzed for full-suite volatile organic compounds (VOCs), including fuel oxygenates, using EPA Method 8260 and for total petroleum hydrocarbons/diesel-range and gasoline-range organics (TPH/DRO and TPH/GRO) using EPA Method 8015.
- 4) The Department requires that additional sampling events continue using the eleven select monitoring wells (i.e.: MW-7, MW-8, MW-10, MW-13, MW-14S, MW-14D, MW-15D, MW-16, MW-17, MS-18S, and MW-18D), six off-site private drinking water wells, and two on-site public supply wells for the purpose of assessing the effectiveness and potential impacts of ISCO injection activities. The Department understands the first (baseline) sampling event will be completed prior to re-starting the ISCO system. The Department anticipates that the remaining sampling events will be completed after week two, after week five, after week eight, and after week twelve of ISCO system operation. All samples collected as part of the ISCO evaluation must be analyzed for full suite VOCs, including fuel oxygenates, total organic carbon, chemical oxygen demand, total dissolved solids, total suspended solids, dissolved and total iron and total chromium.
- 5) The Department requires the submittal of **monthly** progress reports during *CAP* activities. Each progress report must include all data collected as part of ISCO system operation and maintenance and sampling activities. Progress reports must also include a discussion of how site conditions (e.g., dissolved oxygen concentrations, contaminant concentrations) are being affected (i.e., positive and negative) by the use of ISCO technology.

- 6) To assist with the evaluation of *CAP* activities, the Department requires the submittal of an update to the May 2007 *Site Conceptual Model (SCM)* along with the comprehensive ISCO report. This required update must address new data collected before, during, and following injection activities to modify predictions of mass source reductions, fate, and transport of the identified contaminants of concern and an evaluation of how site conditions have changed over time with respect to the site specific corrective action plan activities. The *SCM* is expected to be continually refined with the acquisition of data until resolution/closure. It is understood that new data may change predictions as a normal result of the process. A comprehensive and detailed *SCM* for this site must address the following issues:
- a. Source(s) of petroleum contamination;
 - b. Any features and pathways, surface and/or subsurface, that may have influenced the transport of groundwater and contaminants;
 - c. Fate and transport (known and/or predicted) of contaminants;
 - d. Proposal for supplemental data to fill in gaps to further prove and/or refine the *SCM*.
 - e. Proposal for the use of alternative remedial technologies and/or enhancements to the existing remedial action;
 - f. Discussion of all data collected as part of *CAP* activities (e.g., radius of influence, injection pressure, hydraulic conductivity, hydraulic gradient, soil porosity, total mass of contaminants) and how the analysis of this information demonstrates the effectiveness/ineffectiveness of the chosen remedial technology (i.e., ISCO injection). The *SCM/ISCO* report must include those calculations describing the fate and transport of the dissolved phase petroleum constituents and injected materials (i.e., ozone, hydrogen peroxide). The report must also include calculations for determining the quantity of ozone and hydrogen peroxide likely necessary to complete remedial activities at this site. **The Department anticipates receiving the *SCM/ISCO* report no later than July 2, 2012.**
- 7) By copy of this letter, the respective property owners have been notified of the *CAP* activities and the additional drinking water supply well sampling requirements. Provide a copy of all drinking water sampling results to the Oil Control Program, the Frederick County Health Department, and the respective property owner(s).
- 8) Based on the continued pilot testing activities, the Department does not require the submittal of a revised *CAP* at this time. An updated site management schedule is enclosed for your review and approval.
- 9) Notify the case manager a minimum of five (5) working days prior to re-starting the ISCO injection system.

Mr. Herbert M. Meade
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If you have any questions, please contact the case manager, Mr. Jim Richmond, at 410-537 3337 (email: jrichmond@mde.state.md.us) or me at 410-537-3499 (email: sbull@mde.state.md.us).

Sincerely,



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

JWR/nln

Enclosure

cc: Ms. Dorothy M. Stevens (3923 Rosewood Road)
Ms. Kitty Lea Bradley (3990 Farm Lane)
Mr. Richard J. Podliska (3992 Farm Lane)
Mr. Kenneth J. Jackson (3994 Farm Lane)
Mr. Santiago Ayala (3996 Farm Lane)
Mr. Leonard G. Szeliga (3997 Farm Lane)
Mr. Steven M. Slatnick (Groundwater and Environmental Services, Inc.)
Ms. Judy Gloyd (Green Valley Shopping Center)
Ms. Jennifer Andrawos (Resident Agent)
Mr. Norman Handler (Resident Agent)
Robert S. Bassman, Esq. (Bassman, Mitchell & Alfano)
Dwight W. Stone, Esq. (Whiteford, Taylor, Preston)
Mr. George Keller (Frederick County Health Dept.)
Mr. Christopher J. Miceli (VERTEX)
Mr. John Grace (MDE-Water Supply Program)
Priscilla N. Carroll, Esq.
Mr. Christopher H. Ralston
Mr. Horacio Tablada

SITE MANAGEMENT SCHEDULE

Green Valley Citgo

2005-0834-FR

Facility I.D. 11836

Consent Order March 18, 2011

Remedial goals to be achieved in 5 years (March 2016)

Work to be Performed	Submittal/Implementation Deadline	Work Received
CIFCO- Continue execution of the Chemical Oxidation Pilot Test Work Plan	March 31, 2011 - Pilot test results due as referenced in Nov. 18, 2010 approval letter	
CIFCO will Develop a Corrective Action Plan (CAP)	March 31, 2011	March 16, 2011- CAP received including Chemical Oxidation pilot test results
MDE case manager will issue a Site Management Schedule within 30 days of Consent Order execution	Site Management Schedule enclosed with the June 1, 2011 CAP/Extended pilot test approval	
MDE- CAP approval/comments to CIFCO within 60 days of receipt of CAP	June 1, 2011 CAP/Extended pilot test approval	
CIFCO - submittal of revised CAP to MDE within 30 days of receipt of MDE's CAP comments	No later than July 1, 2011	CAP implementation Plan received July 1, 2011
MDE - approval of final CAP within 30 days of receipt of CAP revision 8-week pilot testing approved	No later than August 1, 2011	CAP implementation and extended pilot testing approved August 24, 2011
CIFCO - CAP implementation Within 10 days of MDE approval	No later than September 5, 2011	
CIFCO- CAP implementation and 8-week pilot testing approval requires submittal of progress reports after the third and seventh weeks of testing. Comprehensive pilot testing report due 30 days after completion of pilot testing		ISCO Progress reports received and the Comprehensive Pilot Test Summary Report received December 21, 2011
February 2012. MDE-OCP approval of the additional 3 month use of the ISCO injection system. Approval requires CIFCO to submit monthly progress reports and a final comprehensive ISCO Report. Also requires submittal of an updated Site Conceptual Model (SCM)	Submittal of the monthly ISCO reports in March, April and May 2012. Submittal of the ISCO Report and SCM No later than July 2, 2012	
Quarterly Monitoring Reports Includes sampling data, remediation progress- If OCP comments CIFCO has 60 days to respond for final approval or submit for dispute resolution	February 15 May 15 August 15 November 15	

SITE MANAGEMENT SCHEDULE

<p>Maryland Department of Environment Case Manager</p>	<p>Carroll Independent Fuel Company Case Manager</p>
<p>Mr. Jim Richmond 1800 Washington Blvd., Suite 620 Baltimore MD 21230 P: (410)-537-3337 F: (410)-537-3092 jrichmond@mde.state.md.us</p>	<p>Mr. Herbert M. Meade Environmental, Health and Safety Director Carroll Fuel Service 2700 Loch Raven Boulevard Baltimore MD 21208 P: (410)-261-5450 F: (410)-235-8720 herb.meade@carrollfuel.net</p>
<p>MDE Principal Point of Contact</p>	<p>CIFCO Principal Point of Contact</p>
<p>Mr. Christopher H. Ralston Program Administrator Oil Control Program Maryland Department of the Environment 1800 Washington Blvd., Suite 620 Baltimore MD 21230 P: (410) 537-3442 F: (410) 537-3092 cralston@mde.state.md.us</p> <p>and</p> <p>Priscilla Carroll Assistant Attorney General Office of the Attorney General Maryland Department of the Environment 1800 Washington Blvd., Suite 6048 Baltimore MD 21230 P: (410) 537-3039 F: (410) 537-3943 pcarroll@mde.state.md.us</p>	<p>Mr. John Phelps President Carroll Independent Fuel Company 2700 Loch Raven Boulevard Baltimore MD 21208 P: (410) 235-1066</p>