

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION**

**ADDENDUM NO. 7 TO  
CLEANUP AND ABATEMENT ORDER NO. 92-01**

**KINDER-MORGAN ENERGY PARTNERS, LP O/P; SFPP, LP; POWERINE OIL COMPANY;  
SANTA FE PACIFIC PIPELINE PARTNERS, LP; AND EXXONMOBIL OIL  
CORPORATION**

**MISSION VALLEY TERMINAL  
9950 & 9966 SAN DIEGO MISSION ROAD  
SAN DIEGO COUNTY**

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) finds that:

1. Except as contradicted or superseded by the Findings set forth in this Addendum, all of the previous findings in Cleanup and Abatement Order No. 92-01 and Addenda thereto (CAO) are incorporated into this Addendum.
2. Soil vapor extraction (SVE) combined with groundwater dewatering is being used to cleanup up the light non-aqueous phase liquid (LNAPL) affected soil and groundwater in the off-terminal property. Soil vapor monitoring is used to track remediation effectiveness and progress towards cleanup.
3. Kinder-Morgan Energy Partners submitted *Results of a Soil Vapor Survey to Assess Extent of Previously Uncharacterized LNAPL-Affected Soil in the Off-Terminal Area*, Mission Valley Terminal, dated July 24, 2009.<sup>1</sup> This investigation discovered an area of LNAPL-affected soil (northwestern off-terminal LNAPL zone) adjacent to the western limits of the primary off-terminal LNAPL zone. The Dischargers installed additional SVE wells and a separate SVE system to remediate the northwestern off-terminal LNAPL zone.
4. The tracking of remediation effectiveness and progress towards cleanup is no longer warranted in the primary off-terminal LNAPL zone.<sup>2</sup> The Dischargers submitted a Remedial Compliance Evaluation (RCE) report and supporting documents to demonstrate compliance with CAO Order No. 92-01, Addendum No. 5, Directive No. 2 (Directive No. 2).<sup>3</sup> The data provided in the RCE report and supporting documents showed that cleanup of the primary off-terminal LNAPL zone complied with Directive

---

<sup>1</sup> LFR Inc., *Results of a Soil Vapor Survey to Assess Extent of Previously Uncharacterized LNAPL-Affected Soil in the Off-Terminal Area*, Mission Valley Terminal, San Diego, Ca. July 24, 2009

<sup>2</sup> San Diego Water Board, CAO No. 92-01, Addenda Nos. 5 and 6, Directive 3.

<sup>3</sup> Arcadis, *Post 2010 Remedial Compliance Evaluation Off-terminal LNAPL Zone*, June 29, 2011, Arcadis, *Excavation of LNAPL Affected Soil in the Off-Terminal Area*, December 29, 2010, and Arcadis, *Rebound Testing and Confirmation Soil Sampling in the Primary Off-Terminal LNAPL Zone*, June 27, 2011.

No. 2.<sup>4</sup> Therefore, remediation monitoring is no longer necessary in the primary off-terminal LNAPL zone.

5. The monitoring and reporting program (MRP) in attachment No. 1 of addendum No. 5 was previously amended in Addendum No. 6. Consolidating the MRPs from addenda Nos. 5 and 6 will improve clarity with the MRP.
6. This action is an Order to enforce the laws and regulations administered by the San Diego Water Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to section 15321 of the Resources Agency Guidelines.

**IT IS HEREBY ORDERED** that Cleanup and Abatement Order No. 92-01, addendum No. 5, Attachment 1, Monitoring and Reporting Program and Addendum No. 6 is replaced by the following:

- A. **AUTHORITY AND PURPOSE:** The Dischargers are directed to submit the technical reports required in this Monitoring and Reporting Program (MRP) pursuant to California Water Code sections 13267 and 13304. This MRP is intended to document compliance with Cleanup and Abatement Order No. 92-01 and addenda thereto.
- B. **GROUNDWATER MONITORING:** The Dischargers must measure groundwater elevations quarterly in all monitoring wells, and must collect and analyze groundwater samples from monitoring wells according to the following schedule:
  - a) All groundwater monitoring wells must have samples collected and analyzed quarterly except the following wells, which will be gauged quarterly, and sampled and analyzed annually:

| Well Number |
|-------------|-------------|-------------|-------------|-------------|
| M-1         | R-9         | <b>R-26</b> | <b>R-62</b> | T-12        |
| M-2         | R-15        | <b>R-27</b> | <b>R-63</b> | T-13        |
| M-3         | R-16        | <b>R-29</b> | <b>R-70</b> | T-14        |
| M-6         | R-17        | <b>R-39</b> | LF-5        | T-15        |
| R-1         | R-18        | <b>R-45</b> | S-4         | T-19        |
| R-4         | R-19        | <b>R-48</b> | S-5         |             |
| R-6         | R-20        | R-59AS      | S-9         |             |
| R-7         | <b>R-22</b> | R-60 AM, AD | S-10        |             |
| R-8         | <b>R-24</b> | R-61 AM, AD | S-13        |             |

**Bold = all wells within well cluster**

<sup>4</sup> San Diego Water Board, *Post 2010 Remedial Compliance Evaluation Off-Terminal LNAPL zone, Mission Valley Terminal*, October 17, 2011.

If a sufficient water sample cannot be collected from a shallow monitoring well (AS) during the quarterly monitoring, then a groundwater sample must be collected from the next lower interval within the well cluster. Monitoring wells that are sampled annually must be sampled during the fourth quarter of each year.

All sample collection, storage, and analyses must be performed according to protocols included in the U.S. Environmental Protection Agency (USEPA), “SW-846: Test Methods for Evaluating Solid Wastes Physical/Chemical Methods” (Version 5, dated January 3, 2008). All analyses must be performed in a laboratory certified to perform such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board. Specific methods of analysis must be identified. The director of the laboratory whose name appears on the certification must supervise all analytical work and must sign all reports submitted to the San Diego Water Board. Analytical protocols other than USEPA approved methods or Standard Methods<sup>5</sup> are allowed; the exact methodology must be approved by the San Diego Water Board prior to use.

All samples must be analyzed using USEPA Method 8015 for total petroleum hydrocarbons (TPH) quantifying gasoline and diesel fuel fractions and USEPA Method 8260b for volatile organic compounds including benzene, toluene, ethylbenzene, xylenes, methyl tertiary butyl ether (MTBE), tertiary butyl alcohol (TBA), and all other fuel oxygenates.

- b) All off-terminal groundwater monitoring wells, except for the following wells, must be sampled quarterly for aerobic and anaerobic biodegradation indicators including pH, dissolved oxygen, alkalinity, methane, ferrous iron, sulfate, and nitrate:

Well Number	Well Number	Well Number	Well Number
R-9	R-19	R-36 AD	<b>R-61</b>
R-11	R-20	R-37 AD	<b>R-62</b>
R-12	<b>R-26</b>	<b>R-39</b>	<b>R-70</b>
R-15	<b>R-29</b>	<b>R-43</b>	<b>R-79</b>
R-16	<b>R-32</b>	<b>R-44</b>	T-11
R-17	<b>R-34</b>	<b>R-60</b>	T-12

**Bold = all wells within well cluster**

- c) The following off-terminal groundwater monitoring wells must be sampled annually for aerobic and anaerobic biodegradation indicators including pH, dissolved oxygen, alkalinity, methane, ferrous iron, sulfate, and nitrate:

Well Number	Well Number	Well Number	Well Number
R-10	<b>R-33</b>	R-37 AS	<b>R-79</b>
R-22	<b>R-35</b>	<b>R-43</b>	
<b>R-27</b>	R-36 AS	<b>R-44</b>	

**Bold = all wells within well cluster**

<sup>5</sup> Standard Methods for the Examination of Water and Wastewater <http://www.standardmethods.org/>

- d) The following on-terminal groundwater monitoring wells must be sampled annually for aerobic and anaerobic biodegradation indicators including pH, dissolved oxygen, alkalinity, methane, ferrous iron, sulfate, and nitrate:

Well Number	Well Number
R-49AS	R-57AD
R-50AS	R-58AD
R-51AS	R-71 AS
R-52AS	R-74 AS
R-53AS	T-21
R-54AS	S-12
R-55AS	T-3
R-56AS	

- e) The Dischargers must sample any new monitoring or extraction wells quarterly and analyze groundwater samples for the petroleum constituents as required above. The Dischargers may propose changes in the above groundwater monitoring requirements. All proposed changes to this monitoring and reporting program must be provided in writing and are subject to approval by the San Diego Water Board.

C. **REMEDATION MONITORING:** The Dischargers must monitor the remediation systems and soil vapor in the area referred to as the off-terminal northwest LNAPL zone to track remediation effectiveness and progress toward cleanup at the site. The reports for remediation system monitoring and performance must include the following minimum information:

- a) Measure total hydrocarbon concentrations and respirometry gases (O<sub>2</sub>, CO<sub>2</sub>) bi-weekly (approximately every 14 days) at all soil vapor monitoring (SVM) probes. This monitoring can be performed using properly calibrated field instruments, but if field instruments are used, the total hydrocarbon analysis should utilize a Flame Ionization Detector. At each SVM probe, sampling for laboratory analysis should be conducted concurrently with every fourth field monitoring event, unless two consecutive laboratory samples demonstrate that benzene is below 50 parts per billion by volume (ppbv), the C4-C6 hydrocarbon fraction is below 500 ppbv, the C6-C8 hydrocarbon fraction is below 500 ppbv, and TPH is below 20 parts per million by volume (ppmv). Laboratory analysis should be conducted by Gas Chromatography-Flame Ionization Detector (GC-FID). Gas Chromatography-Mass Spectrometry (GC-MS) analyses can be used in place of GC-FID whenever this monitoring program calls for GC-FID vapor or soil analysis, as long as GC-MS is used consistently for all analyses. Report the total hydrocarbon concentration, the composition in terms of carbon number ranges (e.g., percent TPH less than C4, C4-C6, etc. ranges) and concentrations of benzene, toluene, ethylbenzene, xylenes, and MTBE.

- b) Monitor total hydrocarbon concentrations, vapor flow rates, and vacuum bi-weekly (approximately every 14 days) at each soil vapor extraction (SVE) well and optimize vapor flow rates for the SVE well network. A properly calibrated FID field instrument can be used to monitor the total hydrocarbon concentration. At each SVE well, sampling for laboratory analysis should be conducted concurrently with every other field monitoring event, unless two consecutive laboratory samples demonstrate that benzene is below 50 ppbv, the C4-C6 hydrocarbon fraction is below 500 ppbv, the C6-C8 hydrocarbon fraction is below 500 ppbv, and TPH is below 20 ppmv.
- c) Laboratory analysis should be conducted by GC/FID to determine the total concentration and composition in terms of carbon number ranges (e.g., percent TPH less than C4, C4-C6, etc. ranges) and concentrations of benzene, toluene, ethylbenzene, xylenes, and MTBE.
- d) Demonstrate bi-weekly (every 14 days) that each SVM probe is:
  - 1) Under vacuum at screened depths within the vertical extent of the LNAPL zone;
  - 2) Exposed to vapor flow and not water saturated; and
  - 3) Sufficiently aerated by the vapor flow such that O<sub>2</sub> concentrations exceed 10 percent volume per volume (v/v) at screened depths within the vertical extent of the LNAPL zone.
- e) The Dischargers must maintain a table summarizing remediation system operations indicating beginning and end of time periods when the system(s), or components thereof, were either shut down or not able operate at optimum levels and reasons for the occurrence.
- f) At least every two years collect soil samples from the source zone to assess the effectiveness of the SVE remediation. Soil analysis must include TPH and TPH fraction/composition analysis (as expressed in carbon number ranges), and results from laboratory-based leachate tests (using Synthetic Precipitation and Leachate Procedure (SPLP), USEPA Method 1312).

D. **REBOUND TESTING:** As soon as possible, and no later than October 31, 2013, the Dischargers must submit a work plan to perform a rebound test when the remediation monitoring data (described above) indicate that Directive No. 2 has been achieved. The rebound test work plan must be implemented no later than January 6, 2014. The rebound test report must be received by the San Diego Water Board no later than 5:00 PM on May 30, 2014. When the San Diego Water Board finds that the Dischargers have complied with Directive No. 2 for the off-terminal area, the Dischargers may stop remediation monitoring as described in Directive C above.

- E. **QUARTERLY GROUNDWATER MONITORING REPORTS:** The Dischargers must submit quarterly groundwater monitoring reports to the San Diego Water Board **no later than 30 days** following the end of the quarter according to the following schedule:

Quarter	Monitoring Period	Report Due Date
First Quarter	January -March	April 30
Second Quarter	April-June	July 30
Third Quarter	July-September	October 30
Fourth Quarter	October-December	January 30

The quarterly monitoring reports must be received by the San Diego Water Board no later than 5:00 PM on the report due date and must include:

- a) **Transmittal Letter:** The transmittal letter must discuss any violations and/or petroleum releases during the reporting period and actions taken or planned to correct the problem(s). The letter must be signed by the Dischargers' principal executive officer or his/her duly authorized representative, and must include the following certification statement:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

In order to assist the San Diego Water Board in processing correspondence and reports submitted in compliance with this cleanup and abatement order, the Dischargers must include the following code number in the heading or subject line portion of all correspondence and reports submitted to the San Diego Water Board SL607392800.

- b) **Groundwater elevation:** Groundwater elevation data must be presented in the fourth quarter report each year in tabular form with well number, date of observation, depth to groundwater, groundwater elevation, top of casing elevations, depths to the top of well screens, length of well screens, and total depth for each well included in the monitoring program. The date for all wells containing LNAPL must also include the measured thickness of LNAPL on the groundwater elevation table. A groundwater elevation map must be prepared for the shallow alluvium [AS] interval with the groundwater flow direction and calculated hydrologic gradients(s) clearly indicated in the figures(s). Historical groundwater elevations observed during the previous three-year period must be tabulated in each report.

c) **Reporting Groundwater Analysis Results:**

1. Analytical results from groundwater samples must be presented in tabular format and include the following minimum information: well number, sample collection date, and concentration data for each constituent of concern (COC) required in this Order. Time versus concentration plots and distance versus concentration plots must be included.
2. Provide a site plot plan which clearly illustrates the locations of remediation and monitoring well networks, former/current underground and aboveground storage tank systems (including product piping) and buildings located on site and in the area of the pollution.
3. Provide separate isoconcentration maps for the COCs benzene, MTBE, TBA, and MTBE plus TBA. For well locations that are well clusters, each isoconcentration map must be prepared using the highest concentration observed at each well cluster. Isoconcentration maps must be prepared using log scale (e.g. 1, 10, 100, 1000, etc.). A cross section must be included, oriented along the general core of the plume showing MTBE or MTBE plus TBA concentrations at each well or interval within a well cluster along the cross section.
4. The report must provide narrative technical interpretations of the groundwater data. The text must include a description of any significant increases in pollutant concentrations since the last report, any measures proposed to address the increases, any changes to the site conceptual model, and any conclusions and recommendations for future action.
5. The report must include analytical methods used, detection limits obtained for each reported constituent, lab analysis results, and QA/QC data. A narrative discussion and explanation of any problematic QA/QC data must also be included in the report.
6. The report must describe sample collection protocol, describe how investigation derived wastes are managed at the site, and include documentation of proper off-site disposal of site derived wastes (including but not restricted to contaminated well purge water, soil cuttings, free petroleum product LNAPL, etc.).

d) **Remediation Report:** The Remediation Report must include the following information for all active remediation and any interim remedial actions initiated during the reporting period:

1. Groundwater extraction results must be reported in a tabular format, for each extraction well and for the site as a whole, expressed in gallons of

groundwater extracted per day and total groundwater volume extracted for the quarter.

2. Calculated pollutant removal results, from operation of the groundwater extraction wells and from other cleanup and abatement systems, must be reported in units of chemical mass per day and total mass for the quarter. The fourth quarter report must indicate a total mass of pollutants removed for the preceding year.
  3. Historical mass removal results must be included in the fourth quarterly report each year. Remediation monitoring data are listed in Directive No. C of this MRP. Include a discussion and technical analysis of any data trends, system inadequacies, and system changes/upgrades. The narrative section must also indicate scheduled maintenance events for the next reporting period.
  4. Reports must include an evaluation of effectiveness and assessment of performance. The second and fourth quarter Remediation Reports must include a complete evaluation of the performance and effectiveness of the remediation system(s) at the site. The evaluation must include a full report of system operations during the reporting period, and an assessment of whether the systems are adequately performing to meet all the cleanup and performance milestones required by Addendum No. 5 to Order No. 92-01 and this MRP. If the remediation is not progressing at a rate that will meet one of more of the required milestones; the report narrative must clearly indicate that expectation and include recommendations for the necessary modifications/enhancements to the configuration and/or operation of the remediation systems.
- e) **Use of Registered Professionals:** The Dischargers must provide documentation that plans and reports required under this Order are prepared under the direction of appropriately qualified professionals. California Business and Professions Code sections 6735, 7835, and 7835.1 require that engineering and geologic evaluations and judgments be performed by or under the direction of licensed professionals. A statement of qualifications and license numbers of the responsible lead professionals must be included in all plans and reports submitted by the Dischargers. The lead professional must sign and affix their registration stamp to the report.
- f) **Release Report:** The report must include a list of all releases, regardless of volume, from the tanks and/or piping systems for the quarter. This includes all tanks (permanent or temporary), all sumps, all product transfer pipelines, and all water-draw pipelines. The report must also include a site plot plan indicating the location of each release, the date the each release was discovered, the cause of each release, an estimated volume of material/pollutants associated with each release, date the releases were reported to the agencies as required by

statute/regulation or this Order, and the mitigation methods employed to repair the problem(s). A list of all historical releases and mitigation methods must be included in the fourth quarterly report each year.

- g) **Status Report:** The quarterly report must describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures, results of implementation of the Corrective Action Plan) and work planned for the following quarter. The status report must also indicate any problems in completing site related work during the previous reporting period (e.g., equipment malfunctions, site access problems, etc.).
- F. **VIOLATION REPORTS:** If the Dischargers violate requirements in the Cleanup and Abatement Order and/or addenda thereto, then the Dischargers must notify the San Diego Water Board office by telephone and facsimile as soon as practicable once the Dischargers have knowledge of the violation. The San Diego Water Board may require the Dischargers to submit a separate technical report on the violation within five working days of telephone notification.
- G. **OTHER REPORTS:** The Dischargers must notify the San Diego Water Board verbally prior to any site activities which have the potential to contribute to, create or exacerbate a condition of pollution or nuisance (e.g., cause or contribute to additional contaminant mass or migration of pollution) or which would provide new need for site investigation.
- H. **RECORD KEEPING:** The Dischargers or his/her agent must retain data generated for the above reports, including laboratory results and QA/QC data, for a minimum of six years after origination and must make them available to the San Diego Water Board upon request.
- I. **MONITORING AND REPORTING PROGRAM REVISIONS:** Revisions to the MRP may be ordered by the San Diego Water Board, or requested by the Dischargers. Prior to making MRP revisions, the San Diego Water Board will consider the burden, including costs, of the groundwater monitoring reports relative to the benefits to be obtained from these reports.
- J. The Dischargers must implement this updated Monitoring and Reporting Program commencing in the first quarter 2012 with the quarterly report due on **April 30, 2012**.

Ordered by:   
for James G. Smith, AEO  
DAVID W. GIBSON  
Executive Officer