

1 KATHARINE E. WAGNER (Bar No. 119429)
2 Katharine E. Wagner, Attorney
3 777 Campus Commons Dr., Suite 200
4 Sacramento, CA 95825
5 Telephone: (916) 996-1744
6 Email: Katharine@kewagnerlaw.com

7
8 Attorneys for Petitioner
9 KINDER MORGAN ENERGY PARTNERS, L.P.

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
BEFORE THE
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of Kinder Morgan Energy Partners, L.P.'s Petition for Review of Action by the Los Angeles Regional Water Quality Control Board in Issuance of Cleanup and Abatement Order No. R4-2015-0009.

PETITION FOR REVIEW OF ACTION BY CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; REQUEST FOR STAY; PRELIMINARY POINTS AND AUTHORITIES IN SUPPORT OF PETITION FOR REVIEW; AND REQUEST FOR EVIDENTIARY HEARING

In accordance with section 13320 of the Water Code, Petitioner Kinder Morgan Energy Partners, L.P. (Kinder Morgan) requests review of the Los Angeles Regional Water Quality Control Board's (Regional Board's) January 29, 2015 issuance of Cleanup and Abatement Order No. R4-2015-0009 (the "CAO") to Kinder Morgan regarding the GX-190 Release Area in Carson, California (SCP No. 0532A and Site ID No. 2045R00) (the "Site").

A summary of the basis for Kinder Morgan's Petition and a preliminary statement of points and authorities are set forth in this Petition for Review in accordance with Title 23, California Code of Regulations ("C.C.R.") section 2050(a). Kinder Morgan reserves the right to file supplemental points and authorities in support of the Petition for Review once the administrative record becomes available. Kinder Morgan also reserves the right to submit additional arguments and evidence responsive to the Regional Board's or other interested parties' responses to Kinder Morgan's Petition for Review, to be filed in accordance with 23 C.C.R. § 2050.5.

1 **1. NAME, ADDRESS, TELEPHONE NUMBER, AND EMAIL ADDRESS OF THE**
2 **PETITIONER:**

3 Kinder Morgan Energy Partners, L.P.
4 370 Van Gordon Street
5 Lakewood, CO 80228-8304
6 Attn: Nancy Van Burgel, Assistant General Counsel
7 Email: nancy_vanburgel@kindermorgan.com

8 All materials and documents generated in connection with this Petition for Review should
9 also be provided to the counsel of record for Kinder Morgan at the following addresses:

10 Katharine E. Wagner
11 777 Campus Commons Dr., Suite 200
12 Sacramento, CA 95825
13 Telephone: (916) 996-1744
14 Email: katharine@kewagnerlaw.com

15 **2. THE SPECIFIC ACTION OF THE REGIONAL BOARD WHICH THE STATE**
16 **WATER BOARD IS REQUESTED TO REVIEW:**

17 Kinder Morgan requests review of the Regional Board’s January 29, 2015 issuance of
18 Cleanup and Abatement Order No. R4-2015-0009 (the “CAO”).

19 **3. THE DATE ON WHICH THE REGIONAL BOARD ACTED:**

20 The Regional Board acted on January 29, 2015, the date of correspondence from
21 Executive Officer Samuel Unger to Scott Martin of Kinder Morgan, enclosing the CAO (the letter
22 and enclosed CAO are attached as **Exhibit A**). As thirty (30) days from January 29, 2015 fell on
23 the weekend, this Petition for Review of the Regional Board’s action is timely filed on the next
24 business day, March 2, 2015.

25 **A. FACTUAL AND PROCEDURAL BACKGROUND**

26 **i. Procedural Background**

27 A pipeline leak occurred at the Site on August 11, 1995, promptly after which some 500
28 tons of impacted soil was removed by the prior operator, GATX Terminals Corporation
 (“GATX”). Following soil removal, GATX began groundwater investigation in January 1996.
 Kinder Morgan purchased GATX in March 2001, and, as noted in the CAO, has continued

1 voluntarily to conduct site investigation and cleanup activities at the Site. CAO§ 1.B.

2 Kinder Morgan’s voluntary remedial action has included operation of a hydraulic low
3 non-aqueous phase liquid (“LNAPL”) recovery system, enhanced by soil vapor extraction during
4 the first several years. The CAO describes the substantial rate of LNAPL recovery in the early
5 years of the operation, and that the annual average rate has dropped from 3,000 gallons between
6 2003 and 2005, to less than 200 gallons between 2006 and 2013. CAO, p. 3. In 2011, CH2M
7 Hill completed a LNAPL Evaluation Report and, at the Regional Board’s request, a Feasibility
8 Study, to evaluate alternative technologies to improve LNAPL recovery. *Id.*¹ The Feasibility
9 Study screened nine alternative technologies, including three in situ, three enhanced mobility and
10 three liquid recovery technologies. Four alternatives were then evaluated in detail, including: air
11 sparging, in situ chemical oxidation (ISCO), surfactant-enhanced remediation, and monitored
12 natural attenuation.

13 The Feasibility Study concluded that additional LNAPL recovery using alternative
14 technologies was neither technically nor economically feasible, nor of significant incremental
15 benefit. Costs of the active alternative technologies were very high. The costs of the alternative
16 of monitored attenuation, including actions through 2013 for LNAPL recovery, was estimated at a
17 present value of approximately \$3.3 million (which also provides insight into costs actually spent
18 by Kinder Morgan to date). In comparison, costs of the three alternative active technologies
19 ranged from a present value of \$13 Million to \$47.7 Million (including the \$3.3 Million for
20 existing LNAPL recovery efforts). *See*, Feasibility Study, Section 6, pp. 6-1 through 6-10, and
21 Section 7 (Comparison of Alternatives), pp 7-1 through 7-10.

22 Nevertheless, on December 20, 2012, in a brief, two paragraph letter, the Regional Board
23

24 ¹ The titles and dates of these reports and this correspondence are as follows:

25 CH2MHill, November 14, 2011, *LNAPL Evaluation Report* (“LNAPL Evaluation Report”);

26 Regional Board, February 15, 2012, *Comments on LNAPL Evaluation Report and Request to Submit a
Feasibility Study/Evaluation of Other Remedial Alternatives*;

27 CH2M HILL, June 15, 2012, *Feasibility Study* (“Feasibility Study”);

28 Regional Board, December 20, 2012, *Request to Submit a Detailed Remedial Design and Implementation Plan
for LNAPL Recovery*; and

Kinder Morgan, March 28, 2013, *Letter in response to Regional Board letter dated December 20, 2012.*

1 requested that Kinder Morgan submit a detailed remedial design and implementation plan for
2 further LNAPL recovery using alternative technologies. Kinder Morgan responded with
3 technical discussion by letter dated February 19, 2013.² The Regional Board and Kinder Morgan
4 met on March 14, 2013, to discuss the matter. On March 28, 2013, Kinder Morgan sent a second
5 letter, indicating that the company considered that the requested plan was not appropriate because
6 LNAPL recovery was no longer technically practicable according to the detailed reports by
7 CH2M Hill. In its February 19, 2013, letter, Kinder Morgan noted that the Regional Board had
8 not provided any specific comments on, technical justification for disagreement with, the
9 fundamental technical finding in the CH2M Hill Reports regarding technical practicability of
10 further LNAPL recovery.

11 More than a year later, without further communication, on April 25, 2014, the Regional
12 Board forwarded to Kinder Morgan a draft CAO for comment by May 25, 2014 (Draft CAO).
13 The Draft CAO, like the final CAO, required Kinder Morgan to take three major actions:

- 14 1. Develop and submit a Site Conceptual Model (“SCM”) by April 30, 2015, and, if
15 the SCM suggests assessment based on current data is incomplete, submit a
16 workplan to complete assessment and characterization of LNAPL, and other
potential waste constituents.
- 17 2. Conduct Remedial Action, beginning with development of a detailed remedial
18 design and implementation plan (“RAP”) for further LNAPL recovery, and
19 cleanup of dissolved phase contamination after completion of LNAPL removal,
20 followed by implementation of the RAP and submission of Remedial Action
Confirmation Work Plans/Reports or a Remediation Completion Report, each
action due “according to the schedule specified by the Executive Officer.”
- 21 3. Continue semiannual groundwater monitoring and reporting pursuant to a
22 Monitoring and Reporting Program in Attachment C to the CAO.

23 Draft CAO at Provisions 1-4, pp.7-8. The CAO indicates that Kinder Morgan shall cleanup and
24 abate discharges at the Site “forthwith,” but no later than due dates specified for particular
25 actions. The due date for submission of the Site Conceptual Model is April 30, 2015. The due
26 dates for all other requirements are simply described as either “According to the schedule
27

28 ² The CAO omits reference to the detailed letter of February 19, 2013 from Kinder Morgan.

1 specified by the Executive Officer,” or “According to the schedule approved or specified by the
2 Executive Officer.”

3 On behalf of Kinder Morgan, Geosyntec Consultants submitted comments on the Draft
4 CAO, and included in the comment document Geosyntec’s third-party review of the distribution,
5 mobility and feasibility of additional LNAPL recovery at the Site. *See* Letter dated May 23, 2014
6 from Mark Grivetti, P.G., and Todd N. Creamer, P.G. of Geosyntec Consultants to Luis
7 Changkuon of the Regional Board (attached as Exhibit B to this Petition). For another eight
8 months, Kinder Morgan received no communications from the Regional Board; no comments or
9 questions were received on the additional analysis provided in Geosyntec’s third-party review, or
10 on the earlier CH2M Hill reports.

11 On January 29, 2015, the CAO was issued in its final form by the Executive Officer of the
12 Regional Board, without further notice or opportunity for comment, and without an opportunity
13 for hearing or oral discussion of Kinder Morgan’s technical comments or of new Regional Board
14 assertions in the Responsiveness Summary included in the CAO. No changes were made from
15 the draft CAO except three or four corrections respecting data cited in the CAO.

16 **ii. Factual Background on Current Site Conditions**

17 The description of site conditions in the CAO is misleadingly incomplete. The CAO
18 Finding titled “Waste Discharges,” describes the 1995 pipeline spill, maximum historical
19 concentrations of certain petroleum constituents and maximum depths of LNAPL measured at the
20 Site. The next two findings, Finding 7 and 8, are “Source Elimination and Remediation Status”
21 and “Summary of Findings from Site Investigation.” Refusing changes requested by Kinder
22 Morgan in order to make the findings clearer, the final CAO does not specify that the cited data
23 reflect *pre-remediation* conditions. The Regional Board also refused Kinder Morgan’s request in
24 its comment letter that the CAO refer to more recent available data that would show the progress
25 already made through remedial measures at the site, which are the conditions CAO asserts will
26 require further remediation using additional LNAPL recovery.

27 With respect to historical conditions, the CAO includes maximum historical
28

1 measurements for Total Petroleum Hydrocarbon as jet fuel, a result obtained from a hydropunch
2 sample shortly after the spill in 1996. The CAO completely omits to mention results from the
3 sampling of groundwater monitoring wells at the site, which began in 2005. Total Petroleum
4 Hydrocarbon analyses in the groundwater investigation using monitoring wells were performed
5 for petroleum hydrocarbons in the diesel range and gasoline range, and showed dramatic
6 reductions.³ These omitted results should have been addressed in the CAO.

7 As shown in the Geosyntec comments on the Draft CAO and in recent site reports
8 submitted between the comment period and issuance of the CAO, the following information
9 accurately summarizes site conditions:

- 10 • Historically, total petroleum hydrocarbons as diesel (TPH-d) were detected at a maximum
11 concentration of 480,000 milligrams per liter (mg/L) in 2005, while the maximum TPH-d
12 concentration detected in 2014 was 1,200 mg/L.
- 13 • Maximum total petroleum hydrocarbons as gasoline (TPH-g) were detected at a
14 concentration of 46,000 mg/L in 2005, while the maximum TPH-g concentration detected
15 in 2014 was 1,100 mg/L.
- 16 • A maximum benzene concentration of 1,810 micrograms per liter (µg/L) was detected in
17 1999, while the maximum concentration detected in 2014 was 41 µg/L.
- 18 • Toluene, ethylbenzene, and total xylenes were detected at historic site maximum
19 concentrations of 230 µg/L (2008), 220 µg/L (2005), and 1,360 µg/L (2005), respectively,
20 while current conditions consist of concentrations of 0.60 µg/L toluene, 0.82 µg/L
21 ethylbenzene, and “non-detect” for total xylenes (all below their applicable drinking water
22 standards (California Maximum Contaminant Levels).
- 23 • No TPH-g, TPH-d, benzene, toluene, ethylbenzene, or total xylenes, were detected in
24 downgradient monitoring well MW-14 in November 2014.
- 25 • Prior to beginning LNAPL remediation activities, light nonaqueous phase liquid (LNAPL)
26 had been measured in fifteen site monitoring wells, with a maximum thickness of 6.87
27 feet measured in well MW-9 in 1999. As of November 2014, LNAPL is present in nine
28 site monitoring wells at thicknesses ranging from 0.01 to 0.06 feet. LNAPL recovery via
periodic hand bailing remains on-going.

For the reasons set forth below, issuance of the CAO was improper.

³ Analyses for Total Petroleum Hydrocarbons as gasoline captures constituents with fuel carbon in nearly the same range as the test for TPH as jet fuel (carbon range C4-C12 for gasoline versus C4-C14 for jet fuel). Analysis for TPH as diesel captures the C12-C14 range not included in the TPH gasoline test (TPH-d measuring, in total, fuel carbon ranging between C9 and C24).

1 **4. A FULL AND COMPLETE STATEMENT OF REASONS THE ACTION OR**
2 **FAILURE TO ACT WAS INAPPROPRIATE OR IMPROPER:**

3 The CAO inappropriately includes a specific requirement to submit and implement a
4 detailed remedial design and implementation plan for further LNAPL recovery as part of the
5 RAP. The CAO violates Constitutional due process requirements by not providing any technical
6 basis for the LNAPL recovery plan requirement, thus denying Kinder Morgan an opportunity to
7 comment meaningfully on the Regional Board’s action. The Regional Board has disregarded,
8 and, in fact, has not commented on, detailed reports by qualified professional consultants
9 regarding the impracticability of further LNAPL recovery. The Regional Board has asserted only
10 that the only acceptable mode of evaluating LNAPL recovery is pilot testing of various
11 technologies rather than modeling and site-specific data analysis in consultant reports such as the
12 Feasibility Study.

13 Rejecting the option of competent technical analysis in favor of making pilot testing
14 mandatory is also inconsistent with State Board orders governing cleanup and abatement actions,
15 including *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges*
16 *under Water Code Section 13304*, State Board Resolution No. 92-49 (“Resolution 92-49”) and
17 related portions of the State Board’s 2009 Water Quality Enforcement Policy of November 11,
18 2009 (adopted by Resolution 2009-00083). In taking these actions, the Regional Board
19 disregarded the evidence in the extensive technical studies of the Site, and acted based only on
20 brief, unsupported conclusions.

21 Also, the LNAPL Recovery Plan requirements are inappropriately vague and uncertain, in
22 requiring abatement “forthwith,” but “no later than” unspecified due dates “according to the
23 schedule approved or specified by the Executive Officer.” Given the complexity of the Site, with
24 an established history of voluntary and effective remedial action, the meaning of “forthwith” is
25 not susceptible to clear interpretation. The deferral of deadlines to specification by the Executive
26 Officer outside of the CAO denies Kinder Morgan an adequate opportunity to comment on, and
27 seek any appropriate administrative or judicial review of, critical Executive Officer decisions on
28 the schedule mandated for important and costly remedial actions. Kinder Morgan is entitled to

1 clear and certain obligations in an enforcement order. The requirements thus deny Kinder
2 Morgan due process of law, and violate State Board orders governing Regional Board cleanup
3 and abatement requirements.

4 In addition, specifying in the CAO that the remedial design and implementation plan must
5 include LNAPL recovery using alternative technologies violates Water Code Section 13360,
6 because it specifies the manner of compliance with abatement requirements at the site. Kinder
7 Morgan should be allowed to submit a remedial plan that considers and proposes relevant
8 alternatives for site remediation measures, without prejudging that such additional LNAPL
9 recovery must be implemented.

10 **A. In imposing Technically Unjustified Requirements to Employ Costly and**
11 **Ineffective Remedial Methods at the Site, the CAO Fails to Comply with Applicable**
12 **Requirements of State Board Resolution 92-49 and the State Board's Enforcement**
Policy and Water Code Section 13360.

13 The California Legislature recognized the importance of ensuring prompt and cost-
14 effective remediation of hazardous substances in Water Code section 13307, which requires the
15 State Water Resources Control Board ("State Board") to establish consistent policies and
16 procedures for such remediation activities. Under Section 13307(a), these include:

17 . . .

18 (3) Procedures for identifying and utilizing the most cost-effective
19 methods for detecting contamination or pollution and cleaning up or
abating the effects of contamination or pollution;

20 (4) Policies for determining reasonable schedules for investigation and
21 cleanup, abatement, or other remedial action at a site. The policies shall
22 recognize the danger to public health and the waters of the state posed by
23 an unauthorized discharge and the need to mitigate those dangers while at
the same time taking into account, to the extent possible, the resources,
both financial and technical, available to the person responsible for the
discharge;

24 To carry out this mandate, the State Board has adopted *Policies and Procedures for*
25 *Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*, in
26 Resolution No. 92-49. Resolution 92-49 addresses the need for *cost-effective* remedial actions.
27 Res. 92-49 at § III. The State Board's Water Quality Enforcement Policy reinforces the
28 mandatory nature of these guidelines:

1 Regional Water Boards shall comply with State Water Board Resolution No. 92-49,
2 “Policies and Procedures for Investigation and Cleanup and Abatement of Discharges
3 under Water Code Section 13304,” in issuing CAOs. CAOs shall require dischargers to
4 clean up the pollution to background levels or the best water quality that is reasonable if
5 background levels of water quality cannot be restored in accordance with Resolution No.
6 92-49. At a minimum, cleanup levels must be sufficiently stringent to fully support
7 beneficial uses, unless the Regional Water Board allows a containment zone. In the
8 interim, and if restoration of background water quality cannot be achieved, the CAO shall
9 require the discharger(s) to abate the effects of the discharge.

6 Water Quality Enforcement Policy of November 11, 2009, p. 35.

7 Under Resolution No. 92-49, the Regional Board “shall [r]equire the discharger to
8 conduct investigation, and cleanup and abatement, in a *progressive sequence*” Resolution No.
9 92-49 at Section II.A.1 (emphasis supplied). The phased investigation should begin with a
10 preliminary site assessment to confirm the discharge and to develop preliminary information on
11 the nature of the discharge. *Id.* The progressive sequence then is to proceed by requiring the
12 following steps by a discharger, who is to propose measures for Regional Board concurrence
13 rather than to have measures mandated by the Regional Board:

14 “c. Proposal and selection of cleanup and abatement action (to evaluate feasible and
15 effective cleanup and abatement actions, *and to develop preferred cleanup and abatement*
16 *alternatives*);

17 d. Implementation of cleanup and abatement action (to implement *the selected alternative*,
18 and to monitor in order to verify progress);”

18 *Id.* (emphasis supplied). Part III of Resolution 92-49 describes procedures designed “to
19 ensure that dischargers shall have the opportunity to select cost-effective methods for detecting
20 discharges or threatened discharges and methods for cleaning up or abating the effects” of the
21 discharges. Resolution 92-49 at p. 6. Among these procedures are the following:

22 A. *Concur with any investigative and cleanup and abatement proposal* which the
23 discharger demonstrates and the Regional Water Board finds to have a substantial
24 likelihood to achieve compliance, within a reasonable time frame, with cleanup goals and
25 objectives that implement the applicable Water Quality Control Plans and Policies
26 adopted by the State Water Board and Regional Water Boards, and which implement
27 permanent cleanup and abatement solutions which do not require ongoing maintenance,
28 wherever feasible;

B. Consider whether the burden, including costs, of reports required of the discharger
during the investigation and cleanup and abatement of a discharge bears a reasonable
relationship to the need for the reports and the benefits to be obtained from the reports;

1 C. *Require the discharger to consider the effectiveness, feasibility, and relative costs of*
2 *applicable alternative methods for investigation, and cleanup and abatement. Such*
3 *comparison may rely on previous analysis of analogous sites, and shall include supporting*
4 *rationale for the selected methods ...*

5 *Id.* (emphasis supplied).

6 Resolution 92-49 findings cite the restriction in Water Code 13360 against specification of
7 the manner of compliance in orders such a CAO.⁴ *Id.*, Finding 18, p. 3. The detailed
8 requirements of the CAO for submission of a detailed remedial design and implementation plan
9 for further LNAPL recovery are inconsistent with these provisions of Resolution of 92-49 and
10 Water Code Section 13360, in light of prior technical submissions and proposals by Kinder
11 Morgan’s qualified professional consultants, and absent findings by the Regional Board that
12 indicate the basis for the requirements under Resolution 92-49. By demanding a specific
13 LNAPL recovery plan, the Regional Board is restricting the types of technical proposals for
14 cleanup and abatement that are acceptable for the Site. Thus, it does not allow Kinder Morgan an
15 opportunity to make cleanup and abatement proposals for review and concurrence by the
16 Regional Board, based on Kinder Morgan’s comparison of alternatives methods of cleanup and
17 abatement. It is inconsistent with the progressive sequence required by Section II of Resolution
18 92-49, because it preempts the discharger’s development of a preferred cleanup alternative.

19 The Regional Board has failed to consider the burden of reports required during the
20 cleanup and abatement, in relation to the need for and benefits of the reports, in that the CAO
21 fails to acknowledge and take into consideration work already performed by Kinder Morgan to
22 evaluate available technologies for LNAPL recovery in the Feasibility Study.⁵

23 Resolution 92-49 requires that the Regional Board have the discharger evaluate
24 effectiveness, feasibility and relative costs of applicable alternative methods for cleanup and

25 ⁴ Section 13360 provides: "(a) No waste discharge requirement or other order of a regional board or the state board or
26 decree of a court issued under this division shall specify the design, location, type of construction, or particular
27 manner in which compliance may be had with that requirement, order, or decree, and the person so ordered shall be
28 permitted to comply with the order in any lawful manner."

29 ⁵ The CAO also requires a Site Conceptual Model without recognizing the Site Conceptual Model submitted on
30 November 14, 2011 by Kinder Morgan, on which the Regional Board had never commented. In its Responsiveness
31 Summary attached to the CAO, however, the Regional Board’s response on this point indicates that Kinder Morgan
32 may update the previously prepared Site Conceptual Model. *See*, Responsiveness Summary, Comment 23.

1 abatement, and specifies that such comparison may rely on previous analysis of analogous sites.
2 The reference to analysis of analogous sites illustrates that the Regional Board is to avoid
3 requiring excessive data gathering and expensive efforts to “prove” what has already been
4 determined through technical analysis of available data. The Regional Board’s requirement for
5 pilot testing and selection of remedial actions, rejecting analysis showing the impracticability of
6 LNAPL recovery, violates this requirement of Resolution 92-49.

7 i. **The Regional Board’s Action is Fundamentally Inconsistent with the**
8 **Policies and Directives of the Porter Cologne Water Quality Act and**
9 **State Board Resolution 92-49**

10 By requiring that Kinder Morgan perform remedial measures already determined to be
11 inappropriate for the site, the Regional Water Board has failed to balance the substantial, near
12 term and long term, costs associated with such measures, and the information in the record
13 demonstrating the measures would not achieve remedial benefits at the Site. Thus, the LNAPL
14 recovery requirements imposed by the Regional Water Board are not only technically
15 unsupportable; they are unsupportable from an economic perspective. The Regional Water
16 Board's actions are therefore contrary to Resolution 92-49, Section III.C, which requires
17 consideration of alternative remedial methods and cost-effective strategies for remediation.

18 ii. **CAO Requirements for Remediation by Unspecified Dates at the**
19 **Discretion of the Executive Officer are Inconsistent with Resolution**
20 **92-49, Exposing Kinder Morgan to Uncertain and Unreasonable**
21 **Requirements and Surprise Enforcement due to Uncertainty in the**
22 **CAO Requirements**

23 Pursuant to the Time Schedule set forth in Attachment B to the CAO, Kinder Morgan
24 must proceed to comply with any deadlines set by the Executive Officer for submission of the
25 detailed remedial design and implementation plan, conducting pilot studies under such a plan, and
26 submitting other reports. The due dates for such actions are simply left to later determination by
27 the Executive Officer, outside of the CAO. The CAO states that abatement must proceed
28 “forthwith.” The vague nature of the requirements and the uncertainty of these deadlines exposes
Kinder Morgan to unknown required actions and unreasonable costs, based on future actions of
the Executive Officer that are authorized but not defined in the CAO.

1 Resolution 92-49 requires that directives include reasonable schedules, and consider
2 reasonableness of cost.

3 **B. The Regional Board's Action Fails to Accord Kinder Morgan Due Process of**
4 **Law, and is not Supported by Findings based on Evidence.**

5 Under the Fifth Amendment to the United States Constitution, “[n]o person shall . . . be
6 deprived of life, liberty, or property, without due process of law.” (*See also* U.S. Const., 14th
7 Amend. [“[n]o state shall . . . deprive any person of life, liberty, or property, without due process
8 of law”].) In almost identical words, the California Constitution likewise guarantees due process
9 of law. (Cal. Const., art. I, §§ 7, subd. (a) [“A person may not be deprived of life, liberty, or
10 property without due process of law”], 15 [“Persons may not . . . be deprived of life, liberty, or
11 property without due process of law”].)

12 With respect to administrative agency actions, the U.S. Supreme Court has held that the
13 demands of due process require that a person be apprised of the arguments and conclusions upon
14 which the action is based, to enable her to present his case effectively. They may require a
15 hearing, either for oral presentation or presentation of evidence, the nature of which is to be
16 determined by fairness under the specific circumstances. *See, Morrissey v. Brewer*, 408 U. S.
17 471, 481 (1972) (“[D]ue process is flexible and calls for such procedural protections as the
18 particular situation demands”).

19 Due process does not require a hearing at a specific point in the proceeding, so long as a
20 hearing is held before the final order becomes effective. However, if the timing of a hearing is
21 too late to avoid irreversible loss and damage, such as the case with the time required to achieve a
22 hearing in a judicial proceeding under Water Code Section 13330 following State Board
23 discretionary review, it would not satisfy due process requirements. Those who are brought into
24 contest with the government in a quasi-judicial proceeding aimed at controlling their activities are
25 entitled to be fairly advised of what the government proposes and to be heard on the proposal
26 before the final command is issued. *See, United States et al. v. Florida East Coast Railway Co. et*
27 *al.*, 410 U. S. 224, 242 (1973) (citing *Morgan v. United States*, 304 U.S. 1 (1938), 18-19).

28 The test for determining the extent of the procedures required in a given case, including

1 the right to a pre-deprivation hearing, balances three factors: First, the private interest that will be
2 affected by the official action; second, the risk of an erroneous deprivation of such interest
3 through the procedures used, and the probable value, if any, of additional or substitute procedural
4 safeguards; and finally, the Government's interest, including the function involved and the fiscal
5 and administrative burdens that the additional or substitute procedural requirement would entail.
6 *Mathews v. Eldridge*, 424 U.S. 319, 335 (1976); *Machado v. State Water Resources Control*
7 *Board*, 90 Cal. App. 4th 720 (Cal. App. 2001); *see also Wilkinson v. Austin*, 545 U.S. 209, 226-29
8 (2005) (emphasizing role of notice and "fair opportunity for rebuttal" in reducing risk of
9 erroneous deprivation).

10 Here, the private interest is easily identified, in that the CAO orders costly measures that
11 involve expense and physical alteration to the Site. There is substantial risk of erroneous
12 deprivation of this interest through the minimal procedures used in issuing the CAO. The issue
13 here is not whether a Kinder Morgan should be brought in to cleanup a neglected spill.
14 Substantial work has been performed at the site and reports indicate that the required actions
15 regarding LNAPL will not have any appreciable benefit in protecting the public. It is a matter of
16 the choice of remedial paths at a site already under voluntary remediation. The Regional Board
17 procedure did not provide Kinder Morgan and its consultants an opportunity to address technical
18 omissions or errors in the CAO, because the CAO had no supportive technical findings and
19 Kinder Morgan had no opportunity to review and address the statements in the Responsiveness
20 Summary (issued simultaneously with the CAO).

21 Although it is indisputable that the government's interest in cleanup and abatement of
22 spills is real and substantial, it would have provided no significant administrative or fiscal burden
23 to have the relevant issues addressed at a hearing, or certainly to have technical justification
24 provided for Kinder Morgan's review and response. In fact, an orderly process would benefit the
25 government by minimizing misunderstandings in a complex technical arena, avoiding overly
26 broad and vague requirements, and thus saving the Government time and money and resulting in
27 more effective water quality protection.
28

1 The absence of findings and technical support based on evidence, the failure to employ
2 procedures that afforded adequate opportunities for Kinder Morgan to respond to agency findings
3 and demands, and the vague and undefined obligations that may be imposed under the Order by
4 the Executive Officer, deny Kinder Morgan due process of law. The action renders
5 administrative review effectively unavailable and deprives Kinder Morgan of property interests
6 before it can be afforded constitutionally adequate process.

- 7 i. **The basis for the Regional Board’s action is not explained or**
8 **supported, which therefore fails to support the action with findings**
9 **based on evidence in the record.**

10 All administrative orders, including CAOs, must be supported by findings and such
11 findings must be based upon the evidence in the record. Orders not supported by the findings, or
12 findings not supported by the evidence, constitute an abuse of discretion. *Topanga Association*
13 *for a Scenic Community v. County of Los Angeles*, 11 Cal. 3d. 506, 515 (1974); *California Edison*
14 *v. State Water Resources Control Board*, 116 Cal. App. 3d. 751, 761 (1981); *see also In the*
15 *Matter of the Petition of City and County of San Francisco, et al.*, State Board Order No. WQ 95-
16 4 at p. 10 (Sept. 21, 1995). Here, the Regional Board has not supported the requirements of the
17 CAO with findings based on evidence in the record.

18 The only basis given for the Regional Board’s action appears in conclusory general
19 statements. These general statements contradict the fundamental findings of the substantial,
20 technical detail in reports submitted over more than five years regarding the Site, in compliance
21 with Regional Board requests. The Regional Board provided no findings based on evidence to
22 support its rejection of specific, detailed determination in Site technical reports that further
23 LNAPL recovery is impracticable. Nor has the Regional Board responded specifically to
24 determinations in the reports that available technologies specifically offer no benefit, at
25 substantial cost. Under the California Porter Cologne Water Quality Control Act and California
26 Constitution, Kinder Morgan is entitled to an opportunity for meaningful review and to present
27 any basis for objection to a CAO before such an order can become final.
28

1 ii. **The Procedures Employed by the Regional Board in Issuing the CAO**
2 **Failed to Accord Kinder Morgan Due Process of Law**

3 The Regional Board appears to use technical reports and data submitted on behalf of
4 Kinder Morgan as the basis for the CAO requirements. However, without providing any
5 technical comments on those reports, or providing another technical rationale, the Regional Board
6 imposes requirements for an additional LNAPL recovery plan that are wholly inconsistent with
7 the reports. Specifically, the findings of the Feasibility Study, CH2M Hill found that the small
8 amount of LNAPL removal that could be achieved at great cost would not significantly reduce (a)
9 concentrations of the remaining constituents of concern, (b) the remaining volume of LNAPL, or
10 (c) the level of maintenance required for the cleanup. These conclusions were based on screening
11 of nine alternative LNAPL recovery measures and detailed evaluation of five alternatives,
12 consistent with the process outlined in Resolution 92-49.

13 In its Responsiveness Summary attached to the CAO the Regional Board argues that
14 “pilot tests would provide more reliable data to estimate mass removal and associated costs,”
15 because the estimations of potential for mass removal in the Feasibility Study were “based on
16 modeling and assumptions.” The comments on the CAO submitted by Geosyntec pointed out that
17 both CH2M Hill’s analysis and Geosyntec’s third party assessment found site data sufficient to
18 assess the mobility of LNAPL at the Site, including LNAPL transmissivity. They found that “data
19 and analyses indicated the LNAPL body is stable and not migrating, and that current LNAPL
20 transmissivity is extremely low (current LNAPL transmissivity is approximately 0.05 ft²/day),
21 approximately one order of magnitude lower than the minimum range recommended by ITRC
22 (2009b) for ‘practical LNAPL recovery by hydraulic and pneumatic recovery technologies.’” *See*
23 **Exhibit B, p. 1.**

24 In response to the detailed findings by CH2M Hill and Geosyntec, the Regional Board
25 states, vaguely and without further support:

26 Data may indicate that LNAPL recoverability at the Site is low by hydraulic and
27 pneumatic methods; however, LNAPL recovery can be enhanced and achieved by
28 implementing the alternative technologies presented in the June 15, 2012, Feasibility
 Study. Bench-scale or pilot-scale studies are necessary to further evaluate these
 alternatives.

1 See CAO Responsiveness Summary, Response to Comment 1, p. 1. These conclusory and
2 unsupported statements are not technical findings and certainly are not analytical justification for
3 disregarding and discounted detailed work, including analysis of site-specific data, in qualified
4 professional reports.

5 Due process of law cannot be satisfied by merely circulating a document for comment,
6 and then giving no substantive consideration to comments and reports submitted by the order
7 recipient, and then issuing essentially the same order in final form. Nor can it be satisfied by
8 stating simply that a specific form of cleanup, including pilot studies, must be proposed because
9 pilot studies “are necessary to further evaluate these alternatives.” This essentially just concludes,
10 in circular fashion, that the CAO requirement is necessary for the sake of performing the CAO
11 requirement.

12 **iii. The Regional Board’s Order that Kinder Morgan Comply with**
13 **Remedial Deadlines to be Determined in Future by the Executive**
14 **Officer in Effect authorizes Adoption of Additional Requirements**
15 **under the CAO without the Legal Process Required in State and**
16 **Federal Law**

17 Pursuant to the Time Schedule set forth in Attachment B to the CAO, Kinder Morgan
18 must proceed to comply with any deadlines set by the Executive Officer for submission of the
19 detailed remedial design and implementation plan, conducting pilot studies under such a plan, and
20 submitting other reports. The due dates for such actions are simply left to later determination by
21 the Executive Officer, outside of the CAO. The CAO states that abatement must proceed
22 “forthwith.” The vague nature of the requirements and the uncertainty of these deadlines exposes
23 Kinder Morgan to unreasonable costs, based on future actions of the Executive Officer that are
24 authorized but not defined in the CAO. These uncertain deadlines cannot be meaningfully
25 reviewed and, if necessary, appealed by the discharger (or the public), and thus violate due
26 process guarantees of the federal and California Constitutions.

27 **5. THE MANNER IN WHICH THE PETITIONER IS AGGRIEVED:**

28 Kinder Morgan has aggressively pursued cleanup of the impacted soil and aquifer
voluntarily at the Site over the past fourteen years at great cost, and remains committed to

1 completing the remedial project at the Site. As described above, the Regional Board action
2 imposes a wasteful, unnecessary additional economic burden upon Kinder Morgan's remedial
3 project in violation of State Board Resolution 92-49, and is unsupported by findings based on
4 evidence. It unjustifiably increases the environmental impacts of the project with no benefit to
5 water quality. In addition, the Regional Board action was taken in violation of constitutional
6 mandates for due process of law.

7 **6. THE SPECIFIC ACTION BY THE STATE OR REGIONAL BOARD WHICH**
8 **PETITIONER REQUESTS:**

9 As the Petition makes clear above, Kinder Morgan voluntarily has taken responsibility for
10 Site remediation and carried out and paid for extensive work to date (costing over \$3,000,000). A
11 CAO is not needed to complete this action or to govern the logical sequence of steps required
12 under Resolution 92-49. Kinder Morgan requests that the State Water Board issue an order
13 rescinding the CAO. This would provide the opportunity for Kinder Morgan's voluntary
14 remediation to proceed without the necessity of a CAO, or for the Regional Board to develop
15 reasonable and clear CAO revisions that eliminate requirements for submission of a detailed
16 remedial design and implementation plan for further LNAPL recovery at the Site, stating clear
17 deadlines or deferring establishment of further deadlines pending further review and discussion of
18 Site conditions and reports..

19 The lack of a hearing or reasonable technical responses and findings by the Regional
20 Board has been of great concern to Kinder Morgan. Kinder Morgan requests a hearing before the
21 Regional Board if the State Board remands the CAO for revision, CAO, or if a revised CAO is to
22 be issued after rescission of the present CAO. It is in the parties' mutual interests and the public
23 interest that remedial activities at the Site be technically appropriate and reasonable.

24 **7. A STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT OF LEGAL**
25 **ISSUES RAISED IN THE PETITION:**

26 Petitioners' preliminary statement of points and authorities is set forth in Section 4
27 above. Petitioners reserve the right to supplement this statement upon receipt and review of
28 the full administrative record.

1 **8. A STATEMENT THAT THE PETITION HAS BEEN SENT TO THE REGIONAL**
2 **BOARD AND TO THE DISCHARGER, IF NOT THE PETITIONER:**

3 A true and correct copy of this Petition was sent on March 2, 2015 to the Regional Board
4 at the following address:

5 Mr. Samuel Unger, Executive Officer
6 California Regional Water Quality Control Board
7 Los Angeles Region
8 320 West 4th Street, Suite 200
9 Los Angeles, California 90013

10 The Petitioner in this case is the discharger; therefore, the regulations do not require the
11 Petitioner to confirm transmission of this Petition to any other party.

12 **9. A STATEMENT THAT THE SUBSTANTIVE ISSUES OR OBJECTIONS RAISED**
13 **IN THE PETITION WERE RAISED BEFORE THE REGIONAL BOARD:**

14 No hearing was provided by the Regional Board in this action. In the single round of
15 comments allowed on the Draft CAO, Kinder Morgan raised the substantive issues and objections
16 raised in this Petition. *See*, Geosyntec letter of May 25, 2014.

17 **10. REQUEST FOR STAY:**

18 Kinder Morgan requests that the State Board issue a stay of the Regional Board action
19 pending the State Board's full review of this matter. A stay is necessary to prevent irreversible
20 consequences of the Regional Board's action, harming both Kinder Morgan and the environment.

21 There will be no remedy for the wrongful action of the Regional Board if while awaiting
22 review, Kinder Morgan must proceed to comply with any deadlines set by the Executive Officer
23 for submission of the detailed remedial design and implementation plan, conducting pilot studies
24 under such a plan, and for other reports. The due dates for such actions are left to determination
25 by the Executive Officer, outside of the CAO. *See* CAO Attachment B, Sections 2 and 3.

26 Due to the vague nature of the requirements and the uncertainty of these deadlines, Kinder
27 Morgan cannot precisely define the monetary burden of compliance during the pendency of the
28 State Board's review of this Petition. To provide an indication of the potential costs that could be
 suffered, however, we present descriptions of initial compliance actions below, supported by cost

1 estimates in an Affidavit of Richard Sturn, P.G. Senior Hydrologist with CH2M HILL, attached
2 as **Exhibit C** to this Petition. Without a stay, the remedy available from the State Water Board in
3 this matter would be severely compromised. Forcing Kinder Morgan to proceed with actions
4 required under the CAO, without administrative and judicial review of the Regional Board action,
5 would deprive Kinder Morgan of due process of law.

6 **a. There will be substantial harm to the petitioner or to the public interest if a stay is**
7 **not granted.**

8 The Regional Board action forces Kinder Morgan to proceed with major expenditures for
9 potentially unnecessary remedial studies and systems before the State Water Board's decision on
10 the merits would be issued. The attached Affidavit of Richard Sturn, P.G., Senior Hydrologist
11 with CH2M HILL, enclosing a CH2M HILL technical letter from Mr. Sturn and Bill Breedlove,
12 P.E., Senior Chemical Engineer, describes the potential initial actions and corresponding expense
13 that may be required to meet CAO provisions, during the period provided by law for the State
14 Water Board's review. *See, Affidavit of Richard Sturn, P.G.*, attached as **Exhibit C** to this Petition.

15 CH2M Hill explains that relatively long-term (6 to 12 months long) pilot testing would be
16 performed before submission of the RAP, which is assumed to include testing of three
17 technologies: air-lift recirculation (air sparging), surfactant enhanced fluids recovery, and in-situ
18 chemical oxidation. *Id.*, p. 1.

19 Even for a RAP submission deadline as late as the end of 2018, and reducing near term
20 expense by performing the three pilot tests sequentially, with modest overlap, costs incurred for
21 pilot testing during 2015 are estimated at over \$234,000, and for 2016, over \$358,000. *Id.* at p. 2.
22 Under this conservatively estimated timing scenario (which, again, is subject to deadlines set by
23 the Executive Officer which could be earlier), early 2016 would see a significant portion of the
24 2016 expense because two technologies would be in pilot testing during that period. If the
25 deadline for the RAP is set for an earlier point, costs would be accelerated further. *Id.*

26 In addition, completing the Site Conceptual Model (due April 30, 2015) is estimated to
27 cost nearly \$23,000 and completing the Public Participation Plan (due May 15, 2015) is estimated
28 at nearly \$27,000. *Id.* Costs could be higher if subject to requests for revision in comments by

1 the Regional Board.

2 As these estimates show, over \$300,000 dollars of expense would be incurred by Kinder
3 Morgan during the period in which the State Water Board may review this Petition, due to the
4 Regional Board action, if the effect of the action is not promptly stayed. The uncertainty of
5 actions and scheduling inherent in the CAO exposes Kinder Morgan to even more expense and
6 confusion that could result in inappropriate enforcement with attendant defense costs and risk of
7 liability.

8 **b. There will be no substantial harm to other interested persons and to the public**
9 **interest if a stay is granted**

10 Evidence presented in the Site reports cited above shows that the discharge is not
11 impairing present beneficial uses of groundwater, and indicates that proceeding with further
12 LNAPL recovery efforts will not expedite the process of achieving final cleanup goals at the Site.
13 In addition, Kinder Morgan intends to proceed to complete a Site Conceptual Model by the
14 CAO's first April 30, 2015 deadline. Any delay in proceeding further to completing and
15 implementing plans for further LNAPL recovery will not harm other persons or the public
16 interest.

17 **c. The Petition presents substantial questions of law and fact regarding the disputed**
18 **act.**

19 The first important legal question is whether the Regional Board's requirements in the
20 CAO violate Resolution 92-49 by insisting on an implementation plan for further LNAPL
21 recovery, and, in particular, pilot testing of LNAPL recovery systems, in order to evaluate
22 practicability and effectiveness of remedies found inappropriate in technical analysis submitted
23 by a discharger. Here, the Regional Board insisted on pilot testing simply on the basis that the
24 technical analysis was based on "assumptions and modeling." This is inconsistent with
25 Resolution 92-49's call for a logical sequence of steps and selection of remedial measures based
26 on appropriate studies and analysis.

27 The second important legal question is whether the CAO violates Water Code Section
28 13360 by specifying the method of compliance, by mandating that Kinder Morgan include

1 additional LNAPL recovery in a Detailed Remedial Design and Implementation Plan.

2 The third important legal question is whether the CAO is consistent with the Resolution
3 92-49 and constitutional mandates to afford due process of law, in creating open-ended due dates
4 by providing that abatement proceed “forthwith,” no later than dates left to later specification by
5 the Executive Officer. This exposes Kinder Morgan to unknown required actions and
6 unreasonable costs, prevent meaningful reviewed and, if necessary, appeal, and are of concern as
7 a matter of good policy and consistent procedure.

8 The third important question of law and fact is whether there are adequate findings, based
9 on evidence supporting the CAO’s detailed requirements for the remedial design and
10 implementation plan that must include a plan for further LNAPL recovery at the Site.

11 **D. PETITIONER’S REQUEST FOR EVIDENTIARY HEARING:**

12 For the reasons set forth above, Kinder Morgan requests that the State Board conduct a
13 full evidentiary hearing to consider this Petition along with supporting evidence in accordance
14 with Title 23, California Code of Regulations, Section 2052.

15
16 Respectfully Submitted,

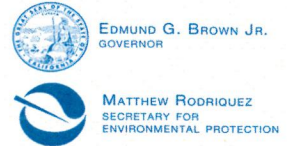
17
18
19 DATED: March 2, 2015

By: 

20 KATHARINE E. WAGNER

21 Attorney for Petitioner
22 Kinder Morgan Energy Partners, L.P.

23
24
25
26
27
28



Los Angeles Regional Water Quality Control Board

January 29, 2015

Mr. Scott Martin
Kinder Morgan Energy Partners, L.P.
1100 W. Town & Country Road
Orange, CA 92868

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
CLAIM NO. 7012 1090 0000 7172 8677

SUBJECT: CLEANUP AND ABATEMENT ORDER NO. R4-2015-0009

SITE/CASE: GX-190 PIPELINE RELEASE AREA, 900 BLOCK OF EAST 233RD STREET, CARSON, CALIFORNIA (SCP NO. 0532A AND SITE ID NO. 2045R00)

Dear Mr. Martin:


The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) is the public agency with primary responsibility for the protection of ground and surface waters and their beneficial uses within major portions of Los Angeles County and Ventura County. The above-referenced site is situated within the jurisdiction of the Regional Board.

Enclosed please find Cleanup and Abatement Order (CAO) No. R4-2015-0009, directing Kinder Morgan Energy Partners, L.P. (Discharger) to monitor, cleanup and abate the effects of wastes, including petroleum hydrocarbons and light nonaqueous phase liquid (LNAPL), that have been discharged to soil and groundwater from the GX-190 pipeline in the vicinity of the 900 block of 223rd Street, in Carson, California. This CAO is issued under section 13304 of the California Water Code (CWC). Should the Discharger fail to comply with any provision of this CAO, it may be subject to further enforcement action, including injunction and civil monetary remedies, pursuant to applicable CWC sections, including but not limited to, sections 13304, 13308, and 13350.

A draft of this CAO was provided to you on April 25, 2014, inviting comments. Comments were provided on May 23, 2014 by Geosyntec Consultants, Inc. on your behalf. The attached document, titled "Responsiveness Summary – Draft Cleanup and Abatement Order No. R4-2014-XX", summarizes the comments received and the Regional Board responses to those comments, including modifications to the CAO

If you have any questions regarding this CAO, please contact Mr. Luis Changkuon at (213) 576-6667 or luis.changkuon@waterboards.ca.gov, or Ms. Su Han at (213) 576-6735 or su.han@waterboards.ca.gov.

Sincerely,


Samuel Unger, P.E.
Executive Officer

Mr. Scott Martin
GX-190 Pipeline Release Area
SCP No. 0532A

- 2

January 29 , 2015

Enclosures: 1. Cleanup and Abatement Order No. R4-2015-0009
 2. Responsiveness Summary – Draft Cleanup and Abatement Order No. R4-2014-XX

cc: Ms. Kristine Schroeder, Kinder Morgan Energy Partners, L.P.
 Mr. Christopher Smiga/Mr. Richard Sturn, CH2MHILL, Inc.
 Mr. Mathew Covington, DLA Piper
 Ms. Josephine Gonzalez/Mr. Kevin Lew, Los Angeles Department of Water and Power
 Ms. Kateri Luka, Tesoro Refining and Marketing Corporation
 Mr. Bradley Frazier, Watson Land Company
 Ms. Maureen J. Bright, Bright and Brown
 Mark Stuart, California Department of Water Resources
 Ted Johnson, Water Replenishment District of Southern California
 Shu-Fang Orr, State Water Resources Control Board, Division of Drinking Water
 Ron Wildermuth, West Basin Municipal Water District
 Jackie Takeda, California Water Service Company
 Sophie James, California Water Service Company
 Ron Sorensen, California Water Service Company

**STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION**

CLEANUP AND ABATEMENT ORDER NO. R4-2015-0009

REQUIRING

KINDER MORGAN ENERGY PARTNERS, L.P.

**TO ASSESS, CLEANUP, AND ABATE
WASTE DISCHARGED TO WATERS OF THE STATE
PURSUANT TO CALIFORNIA WATER CODE SECTION 13304**

**AT GX-190 PIPELINE RELEASE AREA
900 BLOCK OF 233RD STREET
CARSON, CALIFORNIA 90745**

(SCP NO. 0532A; SITE ID NO. 2045R00)

This Cleanup and Abatement Order No. R4-2015-0009 (Order) is issued to Kinder Morgan Energy Partners, L.P. (Kinder Morgan) based on provisions of California Water Code sections 13304 and 13267, which authorizes the California Regional Water Quality Control Board, Los Angeles Region (Regional Board) to issue a Cleanup and Abatement Order and require the submittal of technical and monitoring reports.

The Regional Board finds that:

BACKGROUND

1. **Discharger:** Kinder Morgan is the Responsible Party due to ownership of the GX-190 pipeline.
 - A. In 1995, a leak was reported in the jet fuel GX-190 pipeline at the immediate vicinity of the 900 block of 233rd Street, in Carson, California. At that time, the pipeline transported jet fuel and was owned and operated by GATX Terminals Corporation (GATX).
 - B. In March 2001, Kinder Morgan purchased the GX-190 pipeline from GATX, and has continued to conduct site investigation and cleanup activities at the site.
 - C. As detailed in this Order, the Discharger has caused or permitted waste to be discharged or deposited where it is, or probably will be discharged into the waters of the state which creates, or threatens to create, a condition of pollution or nuisance.
2. **Location:** The site is located in the City of Los Angeles Department of Water and Power (LADWP) right-of-way at the intersection with 233rd Street in Carson, California. Attachment A, Figure 1 (Site Location Map), attached hereto and incorporated herein by reference, depicts the location of the site. Additionally, Figures 2 and 3 (Site Vicinity Maps, Attachment A), also attached hereto and incorporated herein, depicts the site and surrounding area. Land use setting in the vicinity of the site is commercial.
3. **Groundwater Basin:** The site is located in the West Coast Groundwater Basin within the Los Angeles Coastal Plain, and underlain by fined-grained sediments such as silts and clays to depths of approximately 35 feet below ground surface (bgs), and fine to medium grained sands and silty sands

from approximately 35 to 80 feet bgs. Based on site groundwater monitoring data collected in the past 15 years, depth to groundwater had changed from approximately 72 feet below ground surface (bgs) in 1998, to approximately 55 feet bgs in 2013.

SITE HISTORY

- Site Description and Activities:** The site is located at the 900 block of 233rd Street, Carson, California in a right-of-way owned by LADWP. Kinder Morgan's GX-190 pipeline is a dedicated jet fuel underground pipeline along the eastern side of the right-of-way. Commercial businesses are located in the immediate vicinity of the site.
- Chemical Usage and Storage:** Kinder Morgan owns and operates the GX-190 pipeline. The pipeline exclusively transports jet fuel. Some of that jet fuel was discharged to the soil, impacting soil gas, soil and groundwater beneath the pipeline and in the immediate vicinity.

EVIDENCE OF WASTE DISCHARGE AND BASIS FOR SECTION 13304 ORDER

- Waste Discharges:** On August 11, 1995, a leak was identified in the GX-190 jet fuel pipeline at the 900 block of 233rd Street in Carson, California. On August 11, 1995 the pipeline was repaired, and subsurface soil impacted with petroleum hydrocarbons was encountered.

Initial soil assessments were conducted in September 1995. Total petroleum hydrocarbons (TPH) as jet fuel (TPH-J) were detected at concentrations up to 24,000,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$) in a sample collected at 40 feet bgs, and 60,000,000 $\mu\text{g}/\text{kg}$ in a sample collected at 65 feet bgs.

Groundwater investigations have been conducted at the site and vicinity since January 1996. Light nonaqueous phase liquid (LNAPL) has been encountered with thickness up to 6.86 feet (March 2000). TPH-J has been detected in groundwater at concentrations up to 1,000,000 micrograms per liter ($\mu\text{g}/\text{L}$) [January 1996].

- Source Elimination and Remediation Status:** From August 25 to 29, 1995, approximately 500 tons of jet fuel-impacted soil was excavated from the site, and transported to a permitted facility for treatment.

A soil vapor extraction (SVE) system operated at the site from June 2002 to May 2008, and removed an estimated 65,000 pounds of hydrocarbons. The SVE system was shut down in 2008 because a five-month testing period determined that shutting down the vapor extraction component did not significantly change the LNAPL recovery rate and the low to non-detectable concentrations of volatile organic compounds (VOCs) in the system influent.

A hydraulic LNAPL recovery system has been operating at the site since April 2002, and recovered an estimated 10,092 gallons as of June 2014.

Since 1998, groundwater levels have been consistently rising in the LNAPL recovery wells, and LNAPL in some wells has been measured at depths above their screen intervals. To ensure that LNAPL is properly recovered, in 2010 the Regional Board¹ requested Kinder Morgan to submit a work plan to install new LNAPL recovery wells. Based upon communications between Regional

¹ Regional Board, September 3, 2010, *Request to Submit a Workplan for Installation of New Groundwater Monitoring and Free Product Recovery Wells*.

Board staff and Kinder Morgan staff, Kinder Morgan submitted a work plan² to evaluate LNAPL recovery. In 2011, Kinder Morgan implemented the work plan and submitted a LNAPL evaluation report³. Based upon review of the evaluation report, the Regional Board⁴ determined that LNAPL is still recoverable, and requested Kinder Morgan to evaluate alternative technologies to improve LNAPL recovery. In 2012, Kinder Morgan submitted a feasibility study⁵ for LNAPL recovery. The Regional Board reviewed the feasibility study and determined that LNAPL recovery could be enhanced and achieved by implementing alternative technologies. On December 20, 2012, the Regional Board⁶ requested Kinder Morgan to submit a detailed remedial design and implementation plan for further LNAPL recovery (Plan). In reply, Kinder Morgan⁷ informed the Regional Board of their intention not to submit the requested Plan because they believed that LNAPL recovery is no longer technically practicable.

8. Summary of Findings from Site Investigations

The Regional Board has reviewed and evaluated the technical reports and records pertaining to the discharge, detection, and distribution of wastes at the site and in the site vicinity.

- A. Kinder Morgan and its predecessor transported and discharged jet fuel during historical operations of the GX-190 pipeline at the site.
- B. TPH, Benzene, Ethylbenzene, Toluene, and Xylenes have been detected in groundwater at concentrations up to 1,000,000 µg/L, 1,810 µg/L, 220 µg/L, 230 µg/L, and 1,360 µg/L, respectively.
- C. LNAPL has been encountered in groundwater monitoring wells since April 1998, with measurable thickness up to 6.86 feet in 2000, 1.2 feet in 2012, and 0.15 feet in May 2014.

From 2003 to 2005, LNAPL was recovered at an annual average rate of approximately 3,000 gallons. From 2006 to 2010, the annual average rate diminished to approximately 161 gallons. In 2011 and 2012 the average rate was approximately 36 gallons. In 2013, approximately 135 gallons was recovered. During the first half of 2014, approximately 62 gallons was recovered.

- D. Following completion of the SVE system operations in 2008, a soil gas survey was conducted at the site. Soil gas samples were collected at approximately 5 feet bgs in the vicinity of nearby commercial buildings and analyzed for VOCs. The VOCs concentrations detected in shallow soil gas samples were below their respective California Human Health Screening Levels (CHHSL) for both residential and commercial/industrial land use scenarios.

During the 2008 soil gas confirmation sampling, residual TPH, Ethylbenzene, Toluene, and total Xylenes were detected in deeper soil gas samples at concentrations up to 460 µg/L, 0.20 µg/L, 0.98 µg/L, and 0.87 µg/L, respectively.

9. **Regulatory Status:** There have been no orders issued for investigation or cleanup at the site to date from the Regional Board.

² CH2MHill, February 7, 2011, *Work Plan for LNAPL Recovery Evaluation Using CPT/LIF Technology*.

³ CH2MHill, November 14, 2011, *LNAPL Evaluation Report*

⁴ Regional Board, February 15, 2012, *Comments on LNAPL Evaluation Report and Request to Submit a Feasibility Study/Evaluation of Other Remedial Alternatives*.

⁵ CH2MHill, June 15, 2012, *Feasibility Study*.

⁶ Regional Board, December 20, 2012, *Request to Submit a Detailed Remedial Design and Implementation Plan for LNAPL Recovery*

⁷ Kinder Morgan, March 28, 2013, Letter in response to Regional Board letter dated December 20, 2012.

10. **Impairment of Drinking Water Wells:** The Regional Board has the authority to require the Discharger and other dischargers to pay for or provide uninterrupted replacement water service to each affected public water supplier or private well owner in accordance with California Water Code section 13304.
11. **Sources of Information:** The sources for the evidence summarized above include but are not limited to: reports and other documentation in the Regional Board files, telephone calls and e-mail communications with responsible parties, their attorneys and consultants, and site visits.

AUTHORITY - LEGAL REQUIREMENTS

12. Section 13304(a) of the Water Code provides that:

“Any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board, clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including, but not limited to, overseeing cleanup and abatement efforts. A cleanup and abatement order issued by the state board or a regional board may require the provision of, or payment for, uninterrupted replacement water service, which may include wellhead treatment, to each affected public water supplier or private well owner. Upon failure of any person to comply with the cleanup or abatement order, the Attorney General, at the request of the board, shall petition the superior court for that county for the issuance of an injunction requiring the person to comply with the order. In the suit, the court shall have jurisdiction to grant a prohibitory or mandatory injunction, either preliminary or permanent, as the facts may warrant.”

13. Section 13304(c)(1) of the California Water Code provides that:

“. . . the person or persons who discharged the waste, discharges the waste, or threatened to cause or permit the discharge of the waste within the meaning of subdivision (a), are liable to that government agency to the extent of the reasonable costs actually incurred in cleaning up the waste, abating the effects of the waste, supervising cleanup or abatement activities, or taking other remedial actions. . .”

14. Section 13267(b)(1) of the California Water Code provides that:

“In conducting an investigation..., the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharged or, discharging, or who proposes to discharge waste within its region . . . shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

15. **Public Participation:** The Regional Board may require the Discharger to submit a Public Participation Plan or engage in other activities to disseminate information and gather community input regarding the site, as authorized by Water Code sections 13307.1, 13307.5, and 13307.6.

16. The State Water Resources Control Board (hereafter State Water Board) has adopted Resolution No. 92-49, the *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*. This Policy sets forth the policies and procedures to be used during an investigation or cleanup of a polluted site and requires that cleanup levels be consistent with State Water Board Resolution 68-16, the *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Resolution 92-49 and the Basin Plan establish the cleanup levels to be achieved. Resolution 92-49 requires the waste to be cleaned up to background, or if that is not reasonable, to an alternative level that is the most stringent level that is economically and technologically feasible in accordance with Title 23, California Code of Regulations (CCR) Section 2550.4. Any alternative cleanup level to background must (1) be consistent with the maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less than that prescribed in the Basin Plan and applicable Water Quality Control Plans and Policies of the State Water Board.
17. The Regional Board adopted the Basin Plan, which identifies beneficial uses and establishes numerical and narrative water quality objectives to protect those uses. The site overlies groundwater within the West Coast Groundwater Basin. The beneficial uses of the groundwater beneath the site are municipal (MUN), industrial (IND), and agricultural supply (AGR). Numerical water quality objectives that apply to the groundwater at the site include the state maximum contaminant levels (MCLs). The Basin Plan also establishes narrative water quality objectives for several parameters such as bacteria, chemical constituents and radioactivity, mineral quality, nitrate/nitrite, taste and odor. Undesirable tastes and odors in groundwater are an aesthetic nuisance and can indicate the presence of other pollutants. Groundwater shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors, cause nuisance or adversely affect beneficial uses. Benzene, TPH, LNAPL and other waste constituents discharged at the site constitute "waste" as defined in Water Code section 13050(d), and are present at the site in concentrations that exceed applicable water quality objectives.

DISCHARGER LIABILITY

18. As described in Findings of this Order, the Discharger is subject to an order pursuant to Water Code section 13304 because the Discharger has caused or permitted waste to be discharged or deposited where it has discharged to waters of the state and has created, and continues to threaten to create, a condition of pollution or nuisance. The condition of pollution is a priority violation and issuance or adoption of a cleanup or abatement order pursuant to Water Code Section 13304 is appropriate and consistent with policies of the Regional Board.
19. Due to the activities described in this Order, the Discharger has caused or permitted wastes, including LNAPL and dissolved petroleum hydrocarbons to be discharged or deposited where the wastes are, or probably will be discharged into the waters of the State which creates a condition of pollution or nuisance. The Discharger has caused or permitted dissolved petroleum hydrocarbons and LNAPL, to be discharged or deposited where the wastes are or probably will pose a threat to groundwater quality. The Discharger, as the owner and current operator of the GX-190 pipeline at the site, is responsible for complying with this Order.
20. This Order requires investigation, cleanup, and monitoring of the site as required by applicable provisions of the Water Code, the Basin Plan, Resolution 92-49, and other applicable plans, policies, and regulations.

21. The Discharger is required to submit technical reports pursuant to Water Code section 13267, because existing data and information about the site indicate that waste has been discharged, is discharging, or is suspected of discharging at the site from the GX-190 pipeline, which is owned and operated by the Discharger. The technical reports required by this Order are necessary to assure compliance with Section 13304 of the Water Code, including adequate monitoring and cleanup of the site to protect the beneficial uses of waters of the state, to protect against nuisance, and to protect human health and the environment.

CONCLUSIONS

22. The Regional Board is declining to name additional potentially responsible parties (PRPs) for the site in this Order at this time. Substantial evidence indicates that the Discharger caused or permitted waste to be discharged into waters of the State and is therefore appropriately named as a responsible party in this Order. The Regional Board may amend this Order or issue a separate order or orders in the future as a result of further investigation and as more information becomes available.
23. Issuance of this Order is being taken for the protection of the environment and as such is exempt from provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) in accordance with California Code of Regulations, title 14, sections 15061(b)(3), 15306, 15307, 15308, and 15321. This Order generally requires the Discharger to submit plans for approval prior to implementation of cleanup activities at the site. Mere submittal of plans is exempt from CEQA as submittal will not cause a direct or indirect physical change in the environment and/or is an activity that cannot possibly have a significant effect on the environment. CEQA review at this time would be premature and speculative, as there is simply not enough information concerning the Discharger's proposed remedial activities and possible associated environmental impacts. If the Regional Board determines that implementation of any plan required by this Order will have a significant effect on the environment, the Regional Board will conduct the necessary and appropriate environmental review prior to the Executive Officer's approval of the applicable plan.
24. It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring Discharger to clean up the groundwater to meet drinking water standards.
25. Pursuant to Water Code section 13304, the Regional Board may seek reimbursement for all reasonable costs to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action.
26. Any person aggrieved by this action of the Regional Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

REQUIRED ACTIONS

THEREFORE, IT IS HEREBY ORDERED, pursuant to sections 13304 and 13267 of the California Water Code that the Discharger shall cleanup the waste and abate the effects of waste forthwith discharging at and from the GX-190 pipeline release area at the 900 block of 233rd Street, Carson, California. “Forthwith” means as soon as reasonably possible, but in any event no later than the compliance dates specified below, which may be revised by the Executive Officer without revising this Order. More specifically, the Discharger shall:

1. **Develop and Submit a Site Conceptual Model:** The Site Conceptual Model (SCM) should include a written presentation with graphic illustrations (including cross-section and plan-view) of discharge scenario, geology and hydrogeology, waste fate and transport in soil matrix, soil gas and groundwater, distribution of wastes (dissolved phase in groundwater and LNAPL), exposure pathways, sensitive receptors and other relevant information. The SCM shall be constructed based upon actual data collected from the site.

The SCM shall be updated and submitted upon request by the Regional Board as new information becomes available.

If interpretation of the SCM or its update suggests that assessment, characterization and delineation of waste constituents is incomplete, the Discharger shall prepare and submit a work plan(s) to complete assessment and characterization of LNAPL, and other potential waste constituents in soil matrix, soil gas and groundwater and to fully delineate the vertical and lateral extent of wastes in the soil and groundwater at the site and vicinity.

2. **Conduct Remedial Action:** Implement a cleanup and abatement program for the cleanup of wastes in groundwater and the abatement of the effects of the discharges of waste on beneficial uses of water. Specifically, the Discharger shall:
 - A. Develop a detailed remedial design and implementation plan (Plan) for further LNAPL recovery, and cleanup of the dissolved phase contamination after completion of LNAPL removal, for Regional Board review and approval. The Plan(s) shall include, at a minimum:
 - i. Preliminary cleanup goals for soil and groundwater in compliance with State Water Board Resolution 92-49 (“*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*”). Resolution 92-49, Section III.G. requires cleanup to background, unless that is not reasonable. Alternative cleanup levels to background must comply with California Code of Regulations, Title 23, section 2550.4, and be consistent with maximum benefit to the people of the state, protect beneficial uses, and result in compliance with the Basin Plan. Alternative cleanup levels for groundwater shall not exceed numerical and narrative water quality objectives in the Basin Plan, including California’s MCLs and Notification Levels for drinking water as established by the State Water Resources Control Board, Drinking Water Program.
 - ii. Discussion of the alternative remedial technology(ies) proposed for further LNAPL recovery, and cleanup of the dissolved phase in groundwater.
 - iii. Description of the selection criteria for choosing the proposed method over other potential remedial options. Discuss the technical merit, suitability of the selected method under the

- given site conditions and waste constituents present, economic and temporal feasibility, and immediate and/or future beneficial results.
- iv. Estimation of cumulative mass of wastes to be removed with the selected method(s). Include all calculations and methodologies used to obtain this estimate.
 - v. A proposed time schedule for completion of each proposed remedial action.
 - vi. Revisions to or additional Plans may be needed if the implemented remedial measure does not completely achieve all site cleanup goals.
- B. Upon Regional Board approval of the Plan(s), the Discharger shall implement the Plan(s) in accordance with the approved time schedule.
 - C. The Discharger shall submit semiannual remediation progress reports to this Regional Board as set forth in the Monitoring and Reporting Program (Attachment C). The semiannual remediation progress reports shall document all performance data associated with the operating systems.
 - D. Upon completion of implementation of the Plan(s) or reaching the limits of approved remedial actions, submit Remedial Action Confirmation Work Plans/Reports or a Remediation Completion Report according to the schedule specified by the Executive Officer.
3. **Conduct Groundwater Monitoring:** Continue the semiannual groundwater monitoring. As new wells are installed they are to be incorporated into the program. The semiannual groundwater monitoring reports shall be submitted according to the monitoring and reporting program in Attachment C.
 4. **Time Schedule:** The Discharger shall submit all required work plans and reports and complete work within the time schedule listed in Attachment B and Attachment C attached hereto and incorporated herein by reference, which may be revised by the Executive Officer without amendment of this Order.
 5. The Regional Board's authorized representative(s) shall be allowed:
 - A. Entry upon premises where a regulated facility or activity is located, conducted, or where records are stored, under the conditions of this Order;
 - B. Access to copy any records that are stored under the conditions of this Order;
 - C. Access to inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
 - D. The right to photograph, sample, and monitor the site for the purpose of ensuring compliance with this Order, or as otherwise authorized by the California Water Code.
 6. **Contractor/Consultant Qualification:** As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all reports shall be prepared by, or under the supervision of, a California registered professional engineer or geologist and signed by the registered professional. All technical reports submitted by the Discharger shall include a statement signed by the authorized representative certifying under penalty of law that the representative has examined and is familiar with the report and that to his knowledge, the report is true, complete, and accurate. All technical

documents shall be signed by and stamped with the seal of the above-mentioned qualified professionals that reflects a license expiration date.

7. This Order is not intended to permit or allow the Discharger to cease any work required by any other Order issued by the Regional Board, nor shall it be used as a reason to stop or redirect any investigation or cleanup or remediation programs ordered by the Regional Board or any other agency. Furthermore, this Order does not exempt the Discharger from compliance with any other laws, regulations, or ordinances which may be applicable, nor does it legalize these waste treatment and disposal facilities, and it leaves unaffected any further restrictions on those facilities which may be contained in other statutes or required by other agencies.
8. The Discharger shall submit a 30-day advance notice to the Regional Board of any planned changes in name, ownership, or control of the GX-190 pipeline and shall provide a 30-day advance notice of any planned physical changes to the site that may affect compliance with this Order. In the event of a change in ownership or operator, the Discharger also shall provide a 30-day advance notice, by letter, to the succeeding owner/operator of the existence of this Order, and shall submit a copy of this advance notice to the Regional Board.
9. Abandonment of any groundwater well(s) installed for investigation and remediation of the groundwater plume originating from the site must be approved by the Executive Officer at least 30 days in advance. Any groundwater wells removed must be replaced within a reasonable time, at a location approved by the Executive Officer. With written justification, the Executive Officer may approve the abandonment of groundwater wells without replacement. When a well is removed, all work shall be completed in accordance with California Department of Water Resources Bulletin 74-90, "California Well Standards," Monitoring Well Standards Chapter, Part III, Sections 16-19.
10. In the event compliance cannot be achieved within the terms of this Order, the Discharger has the opportunity to request, in writing, an extension of the time specified. The extension request shall include an explanation why the specified date could not or will not be met and justification for the requested period of extension. Any extension request shall be submitted as soon as the situation is recognized and no later than the compliance date. Extension requests not approved in writing with reference to this Order are denied.
11. Reference herein to determinations and considerations to be made by the Regional Board regarding the terms of the Order shall be made by the Executive Officer. Decisions and directives made by the Executive Officer in regards to this Order shall be as if made by the Regional Board.
12. The Regional Board, through its Executive Officer, may revise this Order as additional information becomes available. Upon request by the Discharger, and for good cause shown, the Executive Officer may defer, delete or extend the date of compliance for any action required of the Discharger under this Order. The authority of the Regional Board, as contained in the California Water Code, to order investigation and cleanup, in addition to that described herein, is in no way limited by this Order.
13. The Discharger shall continue any remediation or monitoring activities until such time as the Regional Board determines that sufficient cleanup has been accomplished and this Order has been satisfied.
14. The Discharger shall reimburse the Regional Board for reasonable costs associated with oversight of the investigation and cleanup of the site soils and groundwater emanating from the site, and provide the Regional Board with the name or names and contact information for the person to be provided billing statements from the State Water Resources Control Board.

15. The Discharger shall prepare or update a Public Participation Plan when directed by the Executive Officer as necessary to reflect the degree of public interest in the investigation and cleanup process, and to satisfy applicable sections of the Water Code.
16. The Regional Board, under the authority given by Water Code section 13267(b)(1), requires the Discharger to include a perjury statement in all reports submitted under this Order. The perjury statement shall be signed by a senior authorized representative (not by a consultant). The perjury statement shall be in the following format:

"I, [NAME], certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision, in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

17. The State Water Board adopted regulations requiring the electronic submittals of information over the internet using the State Water Board GeoTracker data management system. The Discharger is required to comply with the regulations by uploading all groundwater monitoring/remediation well data, laboratory analytical data, and all reports and correspondence prepared to date and in the future on to the GeoTracker data management system by the due dates specified in the Regional Board letter and this Order issued to the Discharger. However, the Discharger may be required to submit hard copies of selected documents, data, and maps to the Regional Board in addition to electronic submittal of information to GeoTracker. The text of the regulations can be found at the URL:

http://www.waterboards.ca.gov/ust/electronic_submittal/

18. Failure to comply with the terms or conditions of this Order may result in imposition of civil liabilities, imposed either administratively by the Regional Board or judicially by the Superior Court in accordance with sections 13268, 13304, 13308, and/or 13350 of the California Water Code, and/or referral to the Attorney General of the State of California.
19. None of the obligations imposed by this Order on the Discharger are intended to constitute a debt, damage claim, penalty or other civil action which should be limited or discharged in a bankruptcy proceeding. All obligations are imposed pursuant to the police powers of the State of California intended to protect the public health, safety, welfare, and environment.

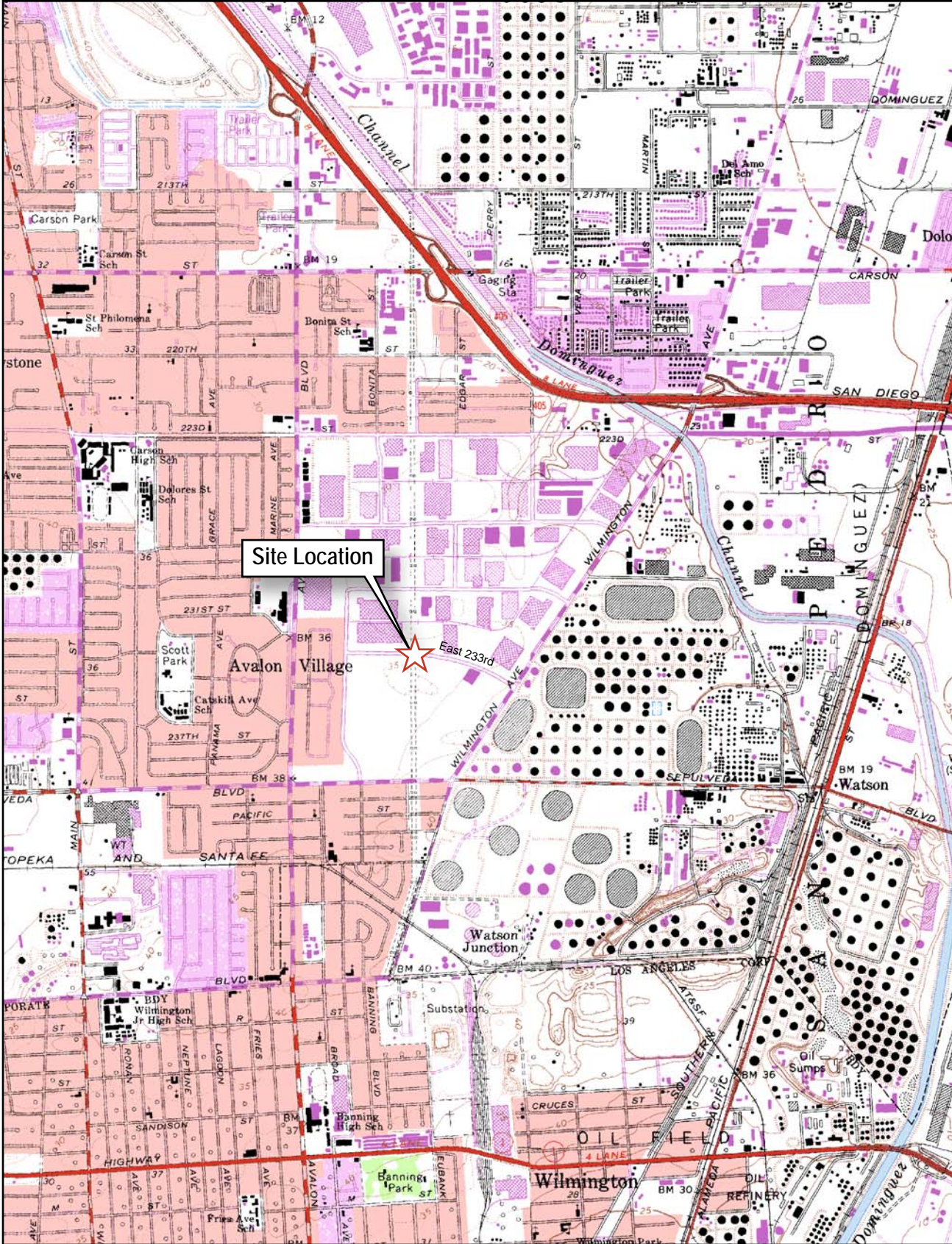
Ordered by:


Samuel Unger, P.E.
Executive Officer

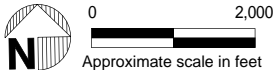
Date:

Jan. 29, 2015

ATTACHMENT A (MAPS)



Site Location

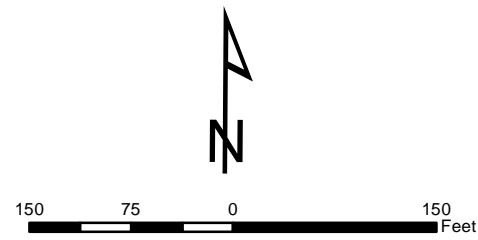


Source: USGS 7-1/2 minute quadrangle maps, Torrance, CA, 1964, photorevised 1981; Long Beach, CA, 1964.

Figure 1-1
Site Location Map
GX-190 Pipeline Release Site
Carson, California



Aerial Date: CH2M HILL 2007



- Legend**
- Water Table Aquifer Groundwater Monitoring Well
 - Water Table Aquifer Extraction Well
 - Shallow Vadose Zone Vapor Extraction Well
 - LNAPL Recovery System Piping
 - Power Line Tower
 - LNAPL Recovery System

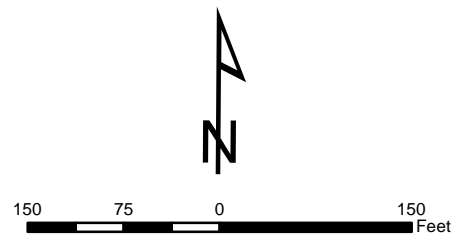
Notes: 1. LNAPL - Light non-aqueous phase liquid.

**Figure 2-1
Site Plan**



GX-190 Pipeline Release Site
Carson, California






Aerial Date: CH2M HILL 2007



Legend

-  MW-7
0.00
Water Table Aquifer Monitoring Well with LNAPL Thickness in Feet
-  EW-1
0.10
Water Table Aquifer Extraction Well with LNAPL Thickness in Feet

-  LNAPL Extent Contour (feet)
-  LNAPL Recovery System
-  Power Line Tower

Notes: 1. LNAPL - Light non-aqueous phase liquid.
2. During the second half of 2011, LNAPL recovered from wells MW-9, MW-10, MW-11, and EW-3 with skimmer pumps; wells EW-3 and MW-9 also hand bailed.

Figure 4
Approximate Extent of LNAPL
November 2011

GX-190 Pipeline Release Site
Carson, California

ATTACHMENT B: TIME SCHEDULE

DIRECTIVE		DUE DATE
1.	Develop a Site Conceptual Model:	
1a	<p>Prepare and submit a Site Conceptual Model which provides details on and illustrates waste discharge scenario, geology and hydrogeology, waste constituent fate and transport in soil, soil gas and groundwater, distribution of waste constituents, exposure pathways, sensitive receptors and other relevant information.</p> <p><i>[Note that the Regional Board may require revisions to the Site Conceptual Model as necessary to complete the Model.]</i></p>	<p>April 30, 2015</p> <p>Within 60 days of receiving directives from Regional Board</p>
2.	Conduct Remedial Action:	
2a	<p>Submit a detailed remedial design and implementation plan for further LNAPL recovery (Plan) that includes a time schedule for implementation.</p> <p>Implement the Plan.</p> <p>Upon completion of implementation of the Plan or reaching the limits of approved remedial actions, submit Remedial Action Confirmation Work Plans/Reports, or a Remediation Completion Report.</p>	<p>According to the schedule specified by the Executive Officer</p> <p>According to the schedule approved or specified by the Executive Officer</p> <p>According to the schedule approved or specified by the Executive Officer</p>
2b	Multiple Plans and Confirmation Work Plans/Reports and Remediation Completion Reports may be required to implement multiple remedial measures to achieve all site cleanup goals.	According to the schedules specified by the Executive Officer
3.	Submit and Implement a Public Participation Plan:	
3a	Submit a Public Participation Plan for review and approval.	May 15, 2015
3b	Update or revise the Public Participation Plan, as needed	According to the schedule approved or specified by the Executive Officer

ATTACHMENT C

MONITORING AND REPORTING PROGRAM FOR
CLEANUP AND ABATEMENT ORDER NO. R4-2015-0009

This Monitoring and Reporting Program is part of Cleanup and Abatement Order No. R4-2015-0009 (CAO). Failure to comply with this program constitutes noncompliance with the CAO and California Water Code, which can result in the imposition of civil monetary liability. All sampling and analyses shall be by United States Environmental Protection Agency approved methods. The test methods chosen for detection of the constituents of concern shall be subject to review and concurrence by the California Regional Water Quality Control Board, Los Angeles Region (Regional Board).

Laboratory analytical reports to be included in technical reports shall contain a complete list of chemical constituents which are tested for and reported on by the testing laboratory. In addition, the reports shall include both the method detection limit and the practical quantification limit for the testing methods. All samples shall be analyzed allowable holding time. All quality assurance/quality control (QA/QC) samples must be run on the same dates when samples were actually analyzed. Proper chain of custody procedures must be followed and a copy of the completed chain of custody form shall be submitted with the report. All analyses must be performed by a California Department of Public Health accredited laboratory.

The Regional Board's *Quality Assurance Project Plan, September 2008*, can be used as a reference and guidance for project activities involving sample collection, handling, analysis and data reporting. The guidance is available on the Regional Board's web site at:

http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/remediation/Board_SGV-SFVCleanupProgram_Sept2008_QAPP.pdf

GROUNDWATER MONITORING

The Discharger shall collect groundwater samples from groundwater monitoring wells installed for the purpose of site investigation, cleanup and monitoring. Any monitoring wells installed in the future shall be added to the groundwater monitoring program and sampled semiannually. The groundwater surface elevation (in feet above mean sea level [MSL]) in all monitoring wells shall be measured and used to determine the gradient and direction of groundwater flow.

The following shall constitute the monitoring program for groundwater.

Constituent	EPA Method
Volatile Organic Compounds (full scan)	EPA 8260B
Total petroleum hydrocarbons as gasoline	EPA 8015 modified
Total petroleum hydrocarbons as diesel	EPA 8015 modified
Temperature	Field*
pH	Field*
Electrical Conductivity	Field*
Dissolved oxygen	Field*
Oxidation-Reduction Potential (ORP)	Field*
Turbidity	Field*

*Field - To be measured in the field.

Constituent	EPA Method
Nitrate	EPA 300.0
Sulfate	EPA 300.0
Methane	EPA RSK-175
Alkalinity	EPA SM 2320B
Ferrous Iron	EPA SM 3500 Fe B

REMEDATION SYSTEMS

Reports on remediation systems shall contain the following information regarding the site remediation systems:

1. Maps showing location of all remediation wells and groundwater monitoring wells, if applicable;
2. Status of each remediation system including amount of time operating and down time for maintenance and/or repair;
3. The report shall include tables summarizing the operating and performance parameters for the remediation systems; and
4. System inspection sheets shall document field activities conducted during each site visit and shall be included in the quarterly reports.

MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted or parameters and locations removed or added by the Executive Officer if site conditions indicate that the changes are warranted.

REPORTING REQUIREMENTS

1. The Discharger shall report all monitoring data and information as specified herein. Reports that do not comply with the required format will be REJECTED and the Discharger shall be deemed to be in noncompliance with the Monitoring and Reporting Program.
2. Semiannual groundwater monitoring reports shall be submitted to the Regional Board according to the schedule below.

<u>Monitoring Period</u>	<u>Report Due</u>
May	July 15
November	January 15

Groundwater monitoring reports shall include a contour map showing groundwater elevations at the site and the groundwater flow direction, and a map showing the aerial extent of LNAPL. The semiannual groundwater monitoring reports shall include tables summarizing the historical depth-to-water, groundwater elevations and historical analytical results for each monitoring well. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Regional Board. Field monitoring well sampling sheets shall be completed for each monitoring well sampled and included in the report.

3. Remediation progress reports shall include an estimate of the cumulative mass of contaminant removed from the subsurface, system operating time, the effectiveness of the remediation system, any field notes pertaining to the operation and maintenance of the system and, if applicable, the reasons for and duration of all interruptions in the operation of any remediation system and actions planned or taken to correct and prevent interruptions. Remediation progress reports and semiannual groundwater monitoring can be combined into a single report, and submitted according to the scheduled above specified.
4. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with the requirements. All data shall be submitted in electronic form in a form acceptable to the Regional Board.
5. All monitoring or remediation progress reports shall include waste constituent iso-concentration maps in plan and cross-section view with soil lithology data, and a map showing the aerial extent of LNAPL.

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

No.	Author	Comment Date	Comment	Los Angeles Regional Water Quality Control Board (Regional Board) Response to Comment
1	Kinder Morgan	5/23/14	Sufficient data have been collected to assess the mobility of LNAPL at the Site including the observed transmissivity of LNAPL. These data, plus analyses performed by CH2M Hill and Geosyntec, indicate that the LNAPL body is stable and not migrating, and that the potential for LNAPL recoverability at the Site is extremely low (current LNAPL transmissivity is approximately 0.05 ft ² /day), one order of magnitude lower than the 0.1 to 0.8 ft ² /day minimum range recommended by ITRC (2009b) for "practical LNAPL recovery by hydraulic and pneumatic recovery technologies"	Data may indicate that LNAPL recoverability at the Site is low by hydraulic and pneumatic methods; however, LNAPL recovery can be enhanced and achieved by implementing the alternative technologies presented in the June 15, 2012, <i>Feasibility Study</i> . Bench-scale or pilot-scale studies are necessary to further evaluate these alternatives.
2	Kinder Morgan	5/23/14	Consistent with Resolution 92-49, additional reduction of pollutant mass from ground water within the LNAPL body is neither technologically nor economically feasible as the incremental benefit of attaining further reductions are not reasonable in comparison with the incremental cost of achieving these reductions. According to the Feasibility Study conducted by CH2M Hill (2012a), the small amount of LNAPL removal that could be achieved at great cost would not significantly reduce the remaining constituents of concern (COCs) concentrations, the remaining volume of LNAPL, or the level of maintenance required for containment of either the dissolved-phase or LNAPL plumes (which currently require no active maintenance). Additionally, enhanced LNAPL recovery efforts could, at best, provide only slight reduction in the timeframes (which for some constituents is greater than 100 years) to achieve water quality objectives, at costs of millions to tens of millions of dollars. For example, none of the remedial alternatives evaluated would be expected to	Kinder Morgan's proposed "monitor-and-no-further-recovery LNAPL management strategy" is not consistent with the maximum benefit to the people of the State and will not achieve water quality objectives prescribed by the Basin Plan within a reasonable time.. The current presence of LNAPL at the site is a continuing source of groundwater contamination and a threat to the existing and potential groundwater beneficial uses designated in the <i>Water Quality Control Plan for Los Angeles Region</i> (Basin Plan), which include municipal uses. Because the basin is designated for municipal use, MCLs are applicable as numeric water quality objectives. . Resolution 92-49 requires dischargers to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored. In no case may an alternative cleanup level result in water quality less than that prescribed in the Basin Plan unless a containment zone has been designated. The requirements for designation of a containment zone, including submission of an application by the discharger, have not been met for this Site.

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			<p>achieve remedial cleanup goals for total petroleum hydrocarbons, trimethylbenzene or naphthalene within 100 years of remedy operation despite expenditures ranging from \$3 million to \$47 million (CH2M Hill, 2012a). Therefore, a monitor-and-no-further-recovery LNAPL management strategy for the Site is consistent with both California regulations and the current scientific understanding of LNAPL behavior in porous media.</p>	
3	Kinder Morgan	5/23/14	<p>The proposed language in the Draft CAO (2014) conflicts with Resolution 92-49.</p> <ul style="list-style-type: none"> • Under <i>Required Actions</i> the CAO indicates both, "Develop a detailed remedial design and implementation plan for further LNAPL recovery ..." and "Resolution 92-49, Section III.G. requires cleanup to background, unless that is not reasonable." Yet, the Board does not offer an opinion on why the common findings of multiple studies about the unreasonableness of continued LNAPL recovery are unacceptable; and • The language in Resolution 92-49, Section III.G. requires that the Board consider how to achieve "the best water quality which is reasonable if background levels of water quality cannot be restored." <p>We recommend that, in lieu of a CAO: (1) sufficient data be collected to support the existence of ongoing natural attenuation mechanisms in both groundwater and LNAPL; (2)</p>	<p>See response to Comment 2. The Regional Board has the authority to require a Discharger to cleanup a site to background levels or to the best water quality (alternative levels) which is reasonable if background levels of water quality cannot be restored (consistent with maximum benefit to the people of the State, protection of beneficial uses, and the Basin Plan). The Regional Board response to Comment 1 indicates that further LNAPL recovery can be enhanced and achieved using alternative technologies other than the hydraulic and pneumatic methods that have been used at the site.</p> <p>The Regional Board must ensure that Dischargers continue waste cleanup and abatement until water quality objectives are attained, or will be attained within a reasonable time.</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			continued periodic monitoring of fluid-level elevations and flow directions, and; (3) annual monitoring of COC concentrations in downgradient groundwater to demonstrate continuing compliance.	
4	Kinder Morgan	5/23/14	LARWQCB (2012) suggested that LNAPL at the GX-190 Site is recoverable in some wells because “result of the baildown testing reveal LNAPL in the tested wells recovered up to 48% of the pre-testing thickness”. However, as described above, the appearance of LNAPL as a floating thickness in a monitoring well is an unreliable indicator of either migrating LNAPL or recoverable LNAPL, and does not imply that recoverable LNAPL exists beneath the Site; furthermore, separate evaluations by CH2MHill (2012a) and Geosyntec (described below) demonstrate the LNAPL transmissivity at the Site is too low to allow meaningful additional recovery.	The comment left out the complete statement. The Regional Board stated in a letter dated February 15, 2012, based upon information submitted in the November 14, 2011, <i>LNAPL Evaluation Report</i> , that “Results of the baildown testing reveal LNAPL in the tested wells was recovered up to 48% of the pre-testing thickness in approximately 5 hours. This indicates that LNAPL is still recoverable in some existing wells.” This statement is a summary of the LNAPL baildown test conducted by CH2M Hill on behalf of Kinder Morgan; and, reflects LNAPL recovery in one specific well, regardless of the transmissivity.
5	Kinder Morgan	5/23/14	The fluid level gauging history shows an area of LNAPL impact that is smaller in 2013 than it was in 2010. By 2010, groundwater elevations had largely stabilized from its significant rise in prior years and more than 98% of all LNAPL volume recovery had occurred (CH2M Hill, 2010; 2014). This shows an LNAPL body that is without an ongoing source, is not migrating and is attenuating by natural means.	The comment states that 98% of all LNAPL volume recovery had occurred; however, the total volume of LNAPL discharged at the Site was not provided to support the statement on percentage of LNAPL recovered through active recovery efforts.
6	Kinder Morgan	5/23/14	Results show a falling trend in Site-wide T_{LNAPL} from approximately 0.3 ft ² /day in 2008 to 0.05 ft ² /day in 2013. This analysis is based on LNAPL thickness and LNAPL volume recovery measurements from wells distributed across the LNAPL body. LNAPL transmissivity on Site has fallen below the minimum range of transmissivity (0.1 to 0.8 ft ² /day) where recovery is considered to be feasible.	This comment contradicts Comment #4, stating that the appearance of LNAPL as a floating thickness in a monitoring well is an unreliable indicator of either migrating LNAPL or recoverable LNAPL. The feasibility of additional LNAPL recovery technologies should be further assessed through pilot testing.

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

7	Kinder Morgan	5/23/14	<p>CH2M Hill concluded the following: (1) additional LNAPL recovery would provide insignificant or no incremental benefit to the time to achieve pre-release conditions for the Site, (2) that the LNAPL impacts are largely immobile with poor recoverability, and (3) that dissolved hydrocarbons from the LNAPL body biodegrade with dozens of feet laterally and downgradient of the plume. Kinder Morgan plans to monitor groundwater at the Site to confirm the occurrence of natural attenuation; this monitoring strategy is consistent with California regulation under the LTCP and Resolution 92-49.</p>	<p>CH2MHill made these conclusions based on assumptions and computer modeling. No pilot tests have been conducted at the site to test any of the evaluated cleanup technologies. Pilot tests would provide data such as number of injection, extraction, and observation wells required, radius of influence, and amount/rate of injection (i.e.: surfactants, peroxide, etc.). These data will allow a more representative evaluation on the cost, effectiveness and feasibility of any cleanup technology.</p> <p>See also, response to Comments 1 and 2.</p>
8	Kinder Morgan	5/23/14	<p>Furthermore, there is precedent in California under Regional Water Board authority for site closure with No Further Action for sites with measurable LNAPL thickness observed in a monitoring well just prior to closure. For example, the May McDonald Grace Trust at 802-806 Donahue Street in Santa Rosa, California was issued the No Further Action letter in the fall of 2013 based on a site remedy that combined excavation with monitored natural attenuation. This location was a former UST site where LNAPL had been observed in multiple monitoring wells for years prior to closure but the LNAPL was demonstrated to have limited migration potential and natural attenuation was shown to be occurring (CRA, 2011). No further monitoring was required as part of the remedy (North Coast RWQCB, 2013)."</p>	<p>The investigations and remediation completed at the May McDonald Grace Trust case met the eight general criteria for closure of the <i>Low-Threat Underground Storage Tank Case Closure Policy</i>.</p> <p>The <i>Low-Threat Underground Storage Tank Case Closure Policy</i> is not directly applicable to this site, and, in addition, the site does not meet the criteria in the Policy on removal of free product (LNAPL) to the maximum extent practicable. As indicated in our response to Comment 1, LNAPL recovery can be enhanced and achieved by implementing alternative technologies, and the effectiveness of these technologies should be assessed after conducting pilot testing.</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

9	Kinder Morgan	5/23/14	<p>LNAPL beneath the GX-190 Site exists in a stable, non-migrating LNAPL body that is submerged and trapped. This residual LNAPL consists of jet fuel depleted of BTEX compounds, and is not a source of fuel oxygenates (CH2M Hill, 2011a,b; 2012a,b; 2013a,b; 2014). Dissolved phase constituents of concern exceed maximum contaminant levels (MCLs) in the source area, but biodegrade immediately downgradient of the plume (CH2M Hill, 2012a). Not only is the plume stable and immobile, it does not pose a significant vapor intrusion risk; concentrations of all VOCs, including BTEX compounds, were below CHHSLs for both residential and commercial/industrial land use scenarios in soil gas samples collected in 2008 (LARWQCB, 2014).</p>	<p>Because the “dissolved phase constituents of concern exceed maximum contaminant levels (MCLs) in the source area, ...”, the CAO will require further LNAPL recovery and cleanup of the dissolved phase contamination.</p> <p>Resolution 92-49 requires dischargers to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored. In no case may an alternative cleanup level result in water quality less than that prescribed in the Basin Plan unless a containment zone has been designated. The requirements for designation of a containment zone, including submission of an application by the discharger, have not been met for this Site.</p>
10	Kinder Morgan	5/23/14	<p>Applicability of Resolution 92-49.</p> <p>Kinder Morgan is not seeking either a Low Threat Closure or a Containment Zone determination even though cleanup efforts have met the most stringent criteria for consideration of both. Several of these criteria are discussed below:</p> <p><i>“The discharger is required to take all actions necessary to prevent the migration of pollutants beyond the boundaries of the containment zone in concentrations which exceed water quality objectives” (Section III.H)</i></p> <p>As indicated above, more than a decade of product recovery has eliminated the migration of pollutants above water quality cleanup objectives beyond a well-defined and shrinking perimeter around the now residual LNAPL source.</p>	<p>Since the waste discharged at the Site is not located in a designated “Containment Zone,” water quality objectives must be achieved in the water table below the release area. See responses to Comments 1 and 2.</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

11	Kinder Morgan	5/23/14	<p>Applicability of Resolution 92-49.</p> <p>Kinder Morgan is not seeking either a Low Threat Closure or a Containment Zone determination even though cleanup efforts have met the most stringent criteria for consideration of both. Several of these criteria are discussed below:</p> <p><i>The Regional Water Board must consider economic feasibility: "Economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of constituents of concern as compared with the incremental cost of achieving those reductions" (Section III.H.1.b);</i></p> <p><i>"The Regional Water Board may make determinations of technological or economic infeasibility after a discharger either implements a cleanup program pursuant to III.G. which cannot reasonably attain cleanup objectives, or demonstrates that it is unreasonable to cleanup to water quality objectives, and may make determinations on the basis of projection, modeling, or other analysis of site-specific data without necessarily requiring that remedial measures be first constructed or installed and operated and their performance reviewed over time unless such projection, modeling, or other analysis is insufficient or inadequate to make such determinations;" (Section III.H.1.c);</i></p> <p>The Board does not offer an opinion or rationale on why the common findings of multiple studies about the unreasonableness of continued LNAPL recovery are unacceptable. These studies were based on analysis of site-specific data appropriate for the determination of LNAPL recoverability.</p>	<p>The referenced certain sections of Resolution 92-49 are not applicable because the discharger has not sought designation of a containment zone. Absent such a designation, cleanup actions must achieve water quality objectives within a reasonable time.</p> <p>Pilot-scale studies must be conducted to provide data and demonstrate the feasibility of remedial alternatives for LNAPL recovery and cleanup of the dissolved phase after completion of LNAPL removal at the site (see our response to your Comment 7 regarding pilot tests).</p>
----	---------------	---------	---	---

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			<p>CH2M Hill concluded that “there is no significant incremental benefit... for the more-aggressive remedial alternatives ... despite the significant cost to implement them,” and that “it is not technically or economically feasible to achieve the alternative cleanup goals for some of the constituents of concern (TPH-g, TPH-d, TMB, and naphthalene), even after 100 years of natural attenuation” (CH2M Hill, 2012a).</p>	
12	Kinder Morgan	5/23/14	<p>Applicability of Resolution 92-49.</p> <p>Kinder Morgan is not seeking either a Low Threat Closure or a Containment Zone determination even though cleanup efforts have met the most stringent criteria for consideration of both. Several of these criteria are discussed below:</p> <p>“Floating free product must be removed to the extent practicable possible” (Section III.H.2.b).</p> <p>CH2M Hill concluded that "there does not appear to be any significant incremental benefit in the time to achieve dissolved-phase cleanup goals within the submerged smear zone [by removing LNAPL]... relative to the No Action and No Further Action alternatives" (CH2M Hill, 2012a). Similarly, it is not feasible to achieve enough LNAPL removal to attain drinking water standards for all contaminants, even given 100-year timescales and potential net present value costs approaching \$50 million (CH2M Hill, 2012a). Taking No Action at the Site will remove an estimated 9 percent of the initial mass through biodegradation in 100 years. In the same time period mass removal estimates for LNAPL recovery, Airlift Sparging, In Situ</p>	<p>The comments reference the <i>Feasibility Study</i> report dated June 15, 2012. The estimated mass removal is based on modeling; however, as indicated in our response to Comments 7 and 11, pilot tests would provide more reliable data to estimate mass removal and associated costs.</p> <p>See also, response to Comment 11 regarding applicability of the cited portions of Resolution 92-49.</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			Chemical Oxidation (ISCO), and Surfactant-Enhanced Remediation would remove an incremental 4 to 55 percent of the initial mass beyond biodegradation alone. Neither of these options will achieve dissolved-phase clean-up goals (CH2M Hill, 2012a).	
13	Kinder Morgan	5/23/14	<p>Applicability of Resolution 92-49.</p> <p>Kinder Morgan is not seeking either a Low Threat Closure or a Containment Zone determination even though cleanup efforts have met the most stringent criteria for consideration of both. Several of these criteria are discussed below:</p> <p><i>"Where reasonable, removal of pollutant mass from ground water within the containment zone may be required, if it will significantly reduce the concentration of pollutants within the containment zone, the volume of the containment zone, or the level of maintenance required for containment."</i> (Section III.H.2.c)</p> <p>Continued LNAPL recovery is not reasonable because time-to-clean-up modeling indicates that source longevity will not be significantly impacted by active remediation techniques when compared with no action. However, Kinder Morgan is planning to confirm the occurrence of natural attenuation as part of their management strategy (CH2M Hill, 2012a). This plan is consistent with Resolution 92-49 requirements.</p>	<p>The site is not located in a "Containment Zone" (See response to Comments 10 and 11).</p> <p>According to the January 15, 2014, <i>Second Semiannual 2013 Groundwater Monitoring Report GX-190 Pipeline Release Site</i>, approximately 135 gallons of LNAPL was recovered in 2013. According to the July 15, 2014, <i>First Semiannual 2014 Groundwater Monitoring Report GX-190 Pipeline Release Site</i>, approximately 62 gallons of LNAPL was recovered in the first half of 2014. These data indicate that LNAPL is still recoverable.</p> <p>Resolution 92-49 requires that cleanup (LNAPL recovery) achieve water quality objectives within a reasonable time; therefore, natural attenuation alone is not consistent with the requirements of the resolution if other active recovery is still feasible. Pilot testing is necessary to determine the cost and effectiveness of additional active recovery.</p>
14	Kinder Morgan	5/23/14	<p><u>Background Item 3 (Page 1)</u>: The depth to groundwater measurements in the monitoring network ranged from approximately 54 to 59 feet</p>	<p>The Draft CAO states that groundwater depth in 2013 was approximately 55 feet below ground surface (bgs), which is within the range of 54 to 59. Furthermore, the average</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			below grade in October 2013 (CH2M Hill, 2014).	groundwater depth in October 2013 was 55.3 feet bgs.
15	Kinder Morgan	5/23/14	<u>Evidence of Waste Discharge and Basis for Section 13304 Order Item 6 (Page 2)</u> : The second paragraph should more accurately describe historical soil and groundwater results as follows: <i>Initial soil assessments were conducted in September 1995. Total petroleum hydrocarbons (TPH) as jet fuel (TPH-J) were detected at concentrations up to 24,000,000 micrograms per kilogram (µg/kg) in the unsaturated zone and 60,000,000 µg/kg at the soil/groundwater interface.</i>	The paragraph will be modified to reflect the sampling depths as follows: “Initial soil assessments were conducted in September 1995. Total petroleum hydrocarbons (TPH) as jet fuel (TPH-J) were detected at concentrations up to 24,000,000 micrograms per kilogram (µg/kg) in a sample collected at 40 feet bgs, and 60,000,000 µg/kg in a sample collected at 65 feet bgs.”
16	Kinder Morgan	5/23/14	<u>Evidence of Waste Discharge and Basis for Section 13304 Order Item 6 (Page 2)</u> : The third paragraph should more accurately reflect the site history as follows: <i>Groundwater investigations have been conducted at the site and vicinity since January 1996. Light nonaqueous phase liquid (LNAPL) was encountered with thickness up to 6.87 feet prior to remediation. TPH-J was detected in groundwater at concentrations up to 1,000,000 micrograms per liter (µg/L) prior to remediation.</i>	The third paragraph will be modified to reflect the sampling dates, as follows: “Groundwater investigations have been conducted at the site and vicinity since January 1996. Light nonaqueous phase liquid (LNAPL) has been encountered with thickness up to 6.86 feet (March 2000). TPH-J has been detected in groundwater at concentrations up to 1,000,000 micrograms per liter (µg/L) [January 1996]. “ The response reflects the correct maximum thickness of 6.86 feet.
17	Kinder Morgan	5/23/14	<u>Evidence of Waste Discharge and Basis for Section 13304 Order Item 7 (Pages 2 & 3)</u> : The last paragraph in Section 7 should more accurately reflect Kinder Morgan’s recent correspondences as follows: <i>“Since 1998, groundwater levels have been consistently rising in the LNAPL recovery wells, and ... On December 20, 2012, the Regional Board requested Kinder Morgan to submit a detailed remedial design and implementation for further LNAPL recovery (Plan). In reply, Kinder Morgan⁷ informed the Regional Board of their intention not to submit the requested Plan because, based on findings from the LNAPL Evaluation Report and</i>	The last paragraph of Findings Item 7 reflects all correspondences regarding LNAPL recovery between Kinder Morgan and the Regional Board. Furthermore, Kinder Morgan’s March 28, 2013 letter stated the following: “Kinder Morgan believes that LNAPL recovery is no longer technically practicable at the GX-190 site as explained in both the Feasibility Study dated June 15, 2012 and additional correspondence dated February 19, 2013.” Therefore, the last paragraph of Findings Item 7, under <i>Evidence of Waste Discharge and Basis for Section 13304 Order</i> , remains unchanged.

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			<p><i>Feasibility Study, additional LNAPL recovery is not reasonable because time-to-cleanup modeling indicates that source longevity will not be significantly impacted by active remediation techniques when compared with no action.”</i></p> <p>Footnote 7 refers to Kinder Morgan’s, February 19, 2013 Letter in Response to Regional Board Letter dated December 20, 2012.</p>	
18	Kinder Morgan	5/23/14	<p><u>Evidence of Waste Discharge and Basis for Section 13304 Order Item 8B (Page 3):</u></p> <p>The summary of findings only includes constituent concentrations prior to site remediation activities and does not accurately describe current conditions. The following sentence should be added to the end of Item 8B to reflect current conditions: <i>“Maximum concentrations detected in October 2013 in the source area are 2,000 µg/L TPH-g, 2,600 µg/L TPH-d, 48 µg/L benzene, 0.54 µg/L ethylbenzene, and 2.6 µg/L total xylenes; toluene was not detected. These constituents were not detected in any of the downgradient site monitoring wells in October 2013” (CH2M Hill, 2014)</i></p>	<p>Findings Item 8B of the Draft CAO summarizes the highest groundwater concentration data collected to date. These concentrations correspond to groundwater samples collected prior to, and during remediation activities. Item 8B remains unchanged.</p>
19	Kinder Morgan	5/23/14	<p><u>Evidence of Waste Discharge and Basis for Section 13304 Order Item 8C (Page 3):</u></p> <p>The following sentences should be added to the end of the first paragraph of Item 8C to reflect current conditions: <i>“Laser induced fluorescence studies show that LNAPL is present as a submerged smear zone beneath the site. The LNAPL pore fluid saturation measurements collected in 2012 ranged from 3.9 to 9.8 percent of pore volume (%PV); conservative estimates of residual LNAPL saturation in the same samples ranged from 3.9 to 9.2 %PV” (CH2M Hill, 2011b).</i></p> <p>Additionally, the text of this item should be modified to accurately reflect the average annual LNAPL recovery rate between 2006 and 2010</p>	<p>Findings Item 8C of the Draft CAO is intended to reflect LNAPL measured in the wells and recovery rates only. The comment provided regarding %PV is not relevant to the intent of Item 8C.</p> <p>The LNAPL recovery rate between 2006 and 2010 will be revised accordingly, to an annual average of 161 gallons. LNAPL recovery for the first half of 2014 (62 gallons) will be incorporated into the CAO.</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			was 161 gallons.	
20	Kinder Morgan	5/23/14	<p><u>Evidence of Waste Discharge and Basis for Section 13304 Order Item 8D (Page 3):</u> The following sentence should be added to the second paragraph to note the findings of the 2008 soil gas survey, in which the data were compared to CHHSLs:</p> <p><i>“All benzene, toluene, ethylbenzene, and total xylenes concentrations detected in the soil gas survey were below industrial California Human Health Screening Levels (CHHSLs).”</i></p>	<p>The first paragraph of Findings Item 8D of the Draft CAO states that volatile organic compounds (VOCs) concentrations detected in soil gas samples were below their respective California Human Health Screening Levels for both residential and commercial/industrial land use scenario. All of the compounds mentioned in your comments are on the list of the referenced VOCs. Therefore, there is no need to duplicate information.</p>
21	Kinder Morgan	5/23/14	<p><u>Authority – Legal Requirements Item 14 (Page 4):</u> Item 14 includes excerpts from the California Water Code, including the following quote:</p> <p><i>“In requiring those reports [technical or monitoring reports], the Regional Board shall provide the person with a written explanation with regard to the need for the reports, and shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”</i></p> <p>As noted above, an LNAPL Evaluation Report and a Feasibility Study were previously submitted, which concluded that additional LNAPL recovery was neither feasible nor would it provide significant incremental benefit. The RWQCB, in response, requested a detailed remedial design and implementation plan for further LNAPL recovery. In contrast to the requirements of the California Water Code Section 13267 (b)(1), the RWQCB did not provide written comments regarding deficiencies with either the LNAPL Evaluation Report or the Feasibility Study or provide</p>	<p>Findings Item 14 quoted section 13267 of the California Water Code (CWC) applies to investigation and monitoring reports. Section 13304 of the CWC applies to requirements for the cleanup and abatement of waste.</p> <p>The Regional Board in a letter dated December 20, 2012, requested Kinder Morgan to submit a <i>Detailed Remedial Design and Implementation Plan for Further LNAPL Recovery</i>, because the further LNAPL recovery could be enhanced and achieved by implementing the alternative technologies presented in the <i>Feasibility Study</i> dated June 15, 2012.</p> <p>Furthermore, this Order and the responses to comments above provide evidence and rationale for the required actions.</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			evidence or rationale to support their request, or why Kinder Morgan's proposed action of continued LNAPL recovery and long term monitoring was inappropriate.	
22	Kinder Morgan	5/23/14	<p><u>Conclusions – Item 24 (Page 6):</u> Item 24 states that: <i>"This Order promotes that policy by requiring Discharger to clean up the groundwater to meet drinking water standards."</i> The sentence should be revised to read, <i>"This Order promotes that policy by requiring Discharger to clean up the groundwater to meet drinking water standards to the extent practical."</i></p>	<p>The Regional Board must require the Discharger to clean up the groundwater to meet drinking water standards, because one of the designated current and future beneficial uses of groundwater in the site area is municipal and domestic water supply. Therefore, Item 24 remains unchanged.</p>
23	Kinder Morgan	5/23/14	<p><u>Required Actions, Item 1 (Page 7):</u> Item I requires submittal of a Site Conceptual Model (SCM) including a written presentation with graphic illustrations (including cross-sections and plain [plan] view) of the discharge scenario, geology and hydrogeology, waste fate and transport in soil matrix, soil gas, and ground water, distribution of wastes, exposure pathways, sensitive receptors and other relevant information.</p> <p>A detailed site conceptual model was submitted to the RWQCB in the LNAPL Evaluation Report on November 14, 2011. This report included a description of Site geology and hydrogeology, the distribution of LNAPL and dissolved phase hydrocarbons, LNAPL mobility and recoverability, geologic cross-sections showing the distribution of LNAPL, plan view maps showing the distribution of LNAPL and dissolved phase hydrocarbons. Additionally, the current and future land use and beneficial use of groundwater were presented in</p>	<p>The referenced SCM described the distribution of LNAPL and dissolved phase in groundwater. The Draft CAO requires the preparation and submittal of a SCM providing information on all wastes, their fate and transport in soil, soil gas, and groundwater, exposure pathways, sensitive receptors and other relevant information.</p> <p>The SCM submitted to the Regional Board on November 14, 2011 shall be updated accordingly.</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			<p>the Feasibility Study submitted June 15, 2012. Consequently, this requirement has been addressed and submitted to the RWQCB. The RWQCB has not provided written comments regarding deficiencies in the SCM presented in these documents.</p> <p>Kinder Morgan will submit a SCM update, if new, relevant information becomes available</p>	
24	Kinder Morgan	5/23/14	<p><u>Required Actions, Item 2A (Page 7):</u> Item 2A requires submittal of a detailed remedial design and implementation plan for further LNAPL recovery and dissolved phase contamination, including preliminary remedial goals, discussion of alternate technologies, and a description of selection criteria. A Feasibility Study was previously submitted in June 2012 which proposed cleanup standards and contained an analysis of the time to cleanup, effectiveness, and cost for 10 potential remediation methods. As previously noted, the Regional Board has not provided technical evidence or rationale for their request, despite the requirements of the California Water Code Section 13267 (b)(1).</p> <p>Preliminary cleanup goals required in Item 2A (i) were included on Page 4-1 of the Feasibility Study (CH2M Hill, 2012a). Item 2A (ii) requires alternative remedial technologies for the remediation of LNAPL and dissolved phase contamination. Ten alternatives were screened, and five of the ten alternatives were further evaluated for effectiveness, time to cleanup, and cost in the 2012 Feasibility Study, which concluded the current remedy is as effective as the alternative methods and proposed to continue with the current remedy. Thus, all of the items</p>	<p>See response to Comment 21. Not all of the items required in Item 2A have been submitted to the Regional Board, as follows:</p> <ul style="list-style-type: none"> a) Discussion of the alternative technology (ies) proposed for further LNAPL recovery and cleanup of the dissolved phase in groundwater. b) Description of the selection criteria for choosing the proposed method over other potential remedial options. c) A proposed implementation schedule and a remediation progress monitoring and reporting schedule for completion of each proposed remedial action.

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			required in Item 2A have already been submitted to the RWQCB.	
25	Kinder Morgan	5/23/14	<u>Attachment A (maps):</u> The most recent figures from the 2013 Second Semi-Annual 2013 Groundwater Monitoring Report, dated January 15, 2013 reflect the current Site conditions more accurately and should be used instead of maps from 2011.	The Draft CAO included the 2011 map to show the approximate aerial extent of LNAPL. The 2013 and 2014 reports do not include maps with the LNAPL aerial extent. Attachment C of the CAO is revised to require a map showing the aerial extent of LNAPL.
26	Kinder Morgan	5/23/14	<u>Attachment B Item 1:</u> Item 1 of Attachment B requires development of a Site Conceptual Model. As previously noted above, the SCM was submitted in the LNAPL Evaluation Report on November 14, 2011 and further supplemented by the land use description and receptor information provided in the Feasibility Study submitted June 15, 2012.	Please refer to our response to Comment #23.
27	Kinder Morgan	5/23/14	<u>Attachment B Item 2:</u> Item 2 of Attachment B requires submittal of a detailed remedial design and implementation plan for further LNAPL recovery, and plan implementation. As noted above, these requirements were previously fulfilled via submittal of the Feasibility Study which was submitted June 15, 2012.	Please refer to our response to Comment #24.
28	Kinder Morgan	5/23/14	<u>Attachment B Item 3a:</u> Item 3 of Attachment B requires submittal of a Public Participation Plan. The due date should be replaced with the words, "to be determined, as necessary." The Draft CAO states in Item 15 under Authority – Legal Requirements on page 4 that, " <i>The Regional Board may require the Discharger to submit a Public Participation Plan or engage in other activities to disseminate information...</i> " and in Item 15 under Required Actions on page 10 that, " <i>The Discharger shall</i>	Pursuant to section 13307.5 and 13307.6 of the CWC, the Regional Board has the authority to require the submittal and implementation of a Public Participation Plan (PPP), for a site issued a CAO. The due date for submittal of an updated or revised PPP in Item 3b of Attachment B is revised to "According to the schedule approved or specified by the Executive Officer".

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

			<p><i>prepare or update a Public Participation Plan when directed by the Executive Officer as necessary to reflect the degree of public interest..." These are conditional and not obligatory statements.</i></p>	
29	Kinder Morgan	5/23/14	<p><u>Attachment C Monitoring and Reporting Program, Groundwater Monitoring:</u> To provide the flexibility to modify and optimize the groundwater monitoring program over time, the first paragraph should be modified to read as follows: <i>"The Discharger shall submit a groundwater monitoring plan for approval. The groundwater monitoring plan shall present the wells to be sampled, the monitoring frequencies for individual wells, sampling and gauging methods, and the laboratory analyses to be performed. The groundwater monitoring plan shall be revised periodically in response to changing site conditions and monitoring well network. The groundwater surface elevation (in feet above mean sea level [MSL]) shall be measured in all monitoring wells and used to determine the gradient and direction of groundwater flow."</i></p>	<p>The Monitoring and Reporting Program (MRP) presented in Attachment C is designed to meet the general requirements of a CAO. However, the discharger is encouraged to submit a work plan describing the proposed scope of work to meet the MRP requirements, for the Regional Board review and approval.</p> <p>The MRP states that specifications in the monitoring program are subject to periodic revisions. Therefore, the first paragraph remains unchanged.</p>
30	Kinder Morgan	5/23/14	<p><u>Attachment C Monitoring and Reporting Program, Monitoring Frequencies:</u> The last word in the paragraph should be revised from "necessary" to "warranted".</p>	<p>The CAO reflects the change from "necessary" to "warranted".</p>

RESPONSIVENESS SUMMARY – DRAFT CLEANUP AND ABATEMENT ORDER R4-2014-XX

Comment due date: May 25, 2014

31	Kinder Morgan	5/23/14	<p><u>Attachment C Monitoring and Reporting Program. Reporting Requirements. Item 5:</u> Cross-sections are typically updated when new lithologic data are obtained. Consequently, the requirement to update cross-sections should be limited to occurrences when new lithologic or soil concentration data are collected. The text of Item 5 should be modified to read as follows: <i>"All monitoring or remediation progress reports shall include iso-concentration maps of TPH-diesel, TPH-gasoline, and benzene in plan view. TPH iso-concentration contours shall be provided on cross-sections with soil lithology data when the SCM is updated or when significant changes are observed."</i></p>	<p>To provide a three-dimensional picture of any groundwater plume and for better monitoring changes of the plume configuration and size, both the plan and cross-section view maps shall be provided. Each monitoring report shall be a stand-alone document for easy reading and understanding by the technical and non-technical readers. Therefore, Item 5 of Reporting Requirements remains unchanged.</p>
32	Kinder Morgan	5/23/14	<p>Site remediation goals for soil and groundwater including "cleanup to background" and "alternative levels that do not exceed numerical and narrative water quality objectives ... including MCLs" are neither reasonable or nor feasible. Cleanup goals should be sufficiently detailed and reasonably detailed and reasonably achievable like the eight general and three media-specific criteria detailed above from the LTCP.</p>	<p>State Water Resources Control Board Resolution 92-49 requires cleanup to background, unless it is not reasonable. Alternative cleanup levels to background must be approved by the Regional Board and be consistent with maximum benefit to the people of the State, protect beneficial uses, and result in compliance with the Basin Plan.</p> <p>See also, response to Comment 2.</p>
33	Kinder Morgan	5/23/14	<p><u>Summary:</u> Additionally, if a CAO were to contain language requiring recovery of LNAPL, it should be describe quantitative, measurable and achievable metrics and an endpoint for that recovery program.</p>	<p>Under Required Actions, Item 2A iv (page 8), language on LNAPL recovery is provided. Based upon effectiveness of the cleanup technologies, an end point will be determined by the Regional Board.</p>



75 Congress Street, Suite 301
Portsmouth, New Hampshire 03801
PH 603.601.3903
FAX 978.263.9594
www.geosyntec.com

23 May 2014

Mr. Luis Changkuon
California Regional Water Quality Control Board
Los Angeles Region
320 West Fourth Street, Suite 200
Los Angeles, California 90013

**Subject: Third-party review and comment on DRAFT Cleanup and Abatement Order:
GX-190 Pipeline Release LNAPL Management, (SCP No. 0532A; Site ID No.
2045R00)**

Dear Mr. Changkuon:

Geosyntec Consultants, Inc., (Geosyntec), on behalf of KMLT LLC, an indirect subsidiary of Kinder Morgan Energy Partners, L.P. (Kinder Morgan), has conducted a third-party review of the distribution, mobility and feasibility of additional light non-aqueous phase liquid (LNAPL) recovery at the GX-190 pipeline release site in Carson, California (the Site). We believe the conclusions of this review are important with respect to the Draft Cleanup and Abatement Order (CAO) issued by the Los Angeles Regional Water Quality Control Board (RWQCB) on 25 April 2014. In summary, we offer the following opinions:

1. CH2M Hill's conclusions (2012a) about the technical infeasibility of further LNAPL recovery should be better placed into the context of current LNAPL science and engineering. In the first section of this letter, we have summarized the current scientific understanding of LNAPL behavior in a porous medium. This information is central to improving overall communication among stakeholders and has direct bearing on analysis of the technical and economic feasibility of LNAPL recovery at the Site as mandated by State Water Resources Control Board Resolution (SWRCB) No. 92-49 (Resolution 92-49), and further reflected in the SWRCB's Low Threat Closure Policy (LTCP) issued in 2012;
2. Sufficient data have been collected to assess the mobility of LNAPL at the Site including the observed transmissivity of LNAPL. These data, plus analyses performed by CH2M Hill and Geosyntec, indicate that the LNAPL body is stable and not migrating, and that the potential for LNAPL recoverability at the Site is extremely low (current LNAPL transmissivity is approximately 0.05 ft²/day), one order of magnitude lower than the 0.1 to 0.8 ft²/day minimum range recommended by ITRC (2009b) for "practical LNAPL recovery by hydraulic and pneumatic recovery technologies;"
3. There are numerous inaccuracies and errors in the Draft CAO which we elucidate in the text below; and
4. Consistent with Resolution 92-49, additional reduction of pollutant mass from ground water within the LNAPL body is neither technologically nor economically feasible as the incremental benefit of attaining further reductions are not reasonable in comparison with

Mr. Luis Changkuon
 23 May 2014
 Page 2

the incremental cost of achieving these reductions. According to the Feasibility Study conducted by CH2M Hill (2012a), the small amount of LNAPL removal that could be achieved at great cost would not significantly reduce the remaining constituents of concern (COCs) concentrations, the remaining volume of LNAPL, or the level of maintenance required for containment of either the dissolved-phase or LNAPL plumes (which currently require no active maintenance). Additionally, enhanced LNAPL recovery efforts could, at best, provide only slight reduction in the timeframes (which for some constituents is greater than 100 years) to achieve water quality objectives, at costs of millions to tens of millions of dollars. For example, none of the remedial alternatives evaluated would be expected to achieve remedial cleanup goals for total petroleum hydrocarbons, trimethylbenzene or naphthalene within 100 years of remedy operation despite expenditures ranging from \$3 million to \$47 million (CH2M Hill, 2012a). Therefore, a monitor-and-no-further-recovery LNAPL management strategy for the Site is consistent with both California regulations and the current scientific understanding of LNAPL behavior in porous media.

5. The proposed language in the Draft CAO (2014) conflicts with Resolution 92-49.
 - Under *Required Actions* the CAO indicates both, “Develop a detailed remedial design and implementation plan for further LNAPL recovery...” and “Resolution 92-49, Section III.G. requires cleanup to background, unless that is not reasonable.” Yet, the Board does not offer an opinion on why the common findings of multiple studies about the unreasonableness of continued LNAPL recovery are unacceptable; and
 - The language in Resolution 92-49, Section III.G. requires that the Board consider how to achieve “the best water quality which is reasonable if background levels of water quality cannot be restored.”

We recommend that, in lieu of a CAO: (1) sufficient data be collected to support the existence of ongoing natural attenuation mechanisms in both groundwater and LNAPL; (2) continued periodic monitoring of fluid-level elevations and flow directions, and; (3) annual monitoring of COC concentrations in downgradient groundwater to demonstrate continuing compliance.

LNAPL Behavior and Recovery in Porous Media – State of the Practice

Historically, LNAPL observed floating on groundwater inside the casing of a monitoring well was presumed to imply both the existence of a similar thickness of LNAPL in the formation adjacent to the well, and certainty of meaningful LNAPL recoverability. This “pancake model” presumed that 100% air saturation overlaid 100% NAPL saturation floating on 100% water saturation in the aquifer. It is now understood, and widely accepted, that the distribution and recoverability implications of the pancake model are false. The behavior of multiple fluids in separate phases in a porous medium is best described by three key concepts:

- degree of fluid (air, oil, water) saturation in soil pores;
- fluid capillary pressure; and

Mr. Luis Changkuon
23 May 2014
Page 3

- the transmissivity of a given fluid in a given porous medium.

These concepts are discussed below and related to observable phenomena: LNAPL thickness in groundwater monitoring wells and LNAPL migration in near-surface aquifers. Where petroleum hydrocarbons have been released near the ground surface, air, water and oil coexist in varying amounts in the pores, or spaces between soil grains, over a thickness of aquifer material (RTDF, 2005). Both water and petroleum hydrocarbon can be present in pores as bound to soil grains and as a liquid. The amount of any one fluid in the pore space (air, water, or oil) can be expressed as percent saturation of the pore space. The sum of all fluid saturations is 100% (RTDF, 2005).

The lowest level of pore saturation for petroleum hydrocarbon involves sorbed and dissolved phases, measured as milligrams per kilogram (mg/kg) or milligrams per liter (mg/L), up to the capacity of the soil and water for their respective phases. When the amount of petroleum hydrocarbon within a pore exceeds those sorptive and soluble capacities, petroleum can exist in a non-aqueous phase liquid (NAPL) and the amount of NAPL present is expressed in terms of percent saturation. At the scale of a site, three categories of saturation exist for a NAPL in a pore network from least to most amount of fluid: residual, mobile, and migrating. Residual NAPL is held in pore spaces, immobilized by capillary forces (RTDF, 2005; API, 2007; ASTM, 2007; ITRC, 2009a). The value of residual saturation is specific to the fluid or fluids present, the wetting history of the soil and properties of the host porous medium (RTDF, 2005). Mobile NAPL is the incremental fraction of saturation greater than residual that is available to move from one pore to the next (Newell et al., 1995; Hawthorne and Kirkman, 2011a). Migrating NAPL is a still greater degree of saturation where NAPL can flow from pore to pore under a gradient, such that the footprint of the NAPL impact is expanding (RTDF, 2005; Hawthorne and Kirkman, 2011a). Notably and discussed further below, NAPL that flows into a monitoring well installed in NAPL-impacted soil is not necessarily at a mobile or migrating saturation because installing the well changes the pore geometry of the aquifer where it is installed.

When pores are occupied by two or more immiscible fluids, the interface between the fluid phases acts as a membrane under tension. This surface tension is associated with the attractive forces that exist between molecules in each liquid phase (API, 2007). When the interface separating two phases is curved, a pressure difference exists across the interface (known as the capillary pressure), which can drive localized fluid movement (API, 2007; RTDF, 2005). For example, when a straw is placed in a glass of water, capillary pressure causes water in the straw to rise above the level of the air-water interface in the surrounding glass. This height difference is known as capillary rise. The smaller the pore size, the greater the capillary rise (and therefore capillary pressure); which is why the capillary fringes of silts and clays are higher than those of sands and gravels (RTDF, 2005). At the pore-throat scale, these pressures are what retard LNAPL flow through porous media under a gradient.

A monitoring well installed into soil is an extremely large soil pore often installed within a coarse-grained filter pack surrounding the well screen, each with different properties from the surrounding medium. As noted on Figure 1 below, the much coarser-grained filter pack will

Mr. Luis Changkuon
 23 May 2014
 Page 4

have greater peak LNAPL saturation than surrounding soil, allowing LNAPL to drain or seep into the well and accumulate as a floating thickness. Thickness, however, is not a meaningful indicator of LNAPL mobility (e.g., ASTM 2007, RTDF 2005, Hawthorne and Kirkman 2011c). As shown below, the same measured LNAPL thickness in wells installed in different soil types is derived from a wide range of peak LNAPL saturations (Figure 1).

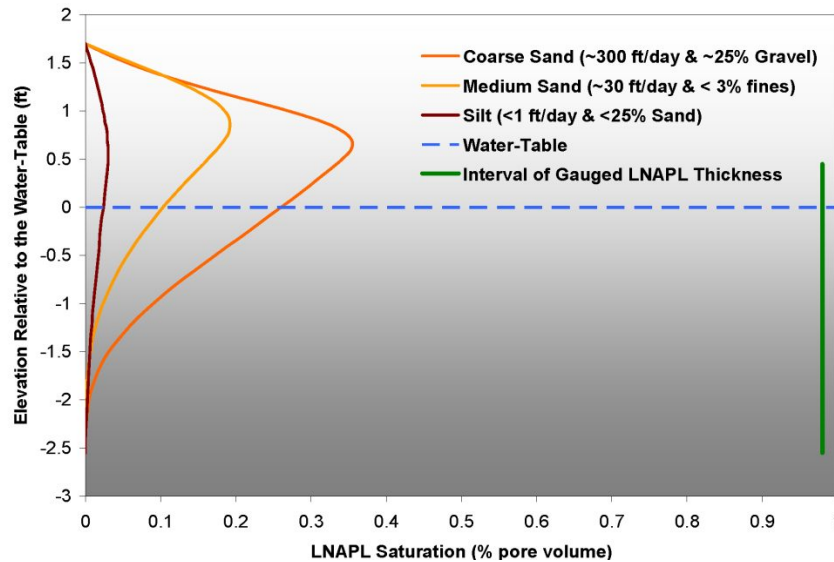


Figure 1. Vertical LNAPL saturation profiles for three different soils impacted by LNAPL. In each case, the same thickness of LNAPL is gauged in a monitoring well. Coarser soils result in higher peak saturation. From Hawthorne and Kirkman, 2011c.

Describing the recoverability of LNAPL requires another concept: transmissivity. The volume of liquid that can flow through a unit width of aquifer under a unit gradient in a unit of time is called the transmissivity. LNAPL transmissivity (T_{LNAPL}) is specific to each LNAPL/porous medium pair (ASTM, 2007; Cho, 2010; Hawthorne and Kirkman, 2011b). Transmissivity is controlled by a combination of fluid saturation, properties of the porous medium (such as pore size and connectedness of the pores), density and viscosity of the LNAPL, the relative permeability of LNAPL and water and the thickness of the LNAPL-impacted interval. A highly transmissive LNAPL/soil combination does not necessarily mean LNAPL is migrating, but that it could migrate under a sufficient hydraulic gradient. LNAPL transmissivity, therefore, is the propensity for LNAPL to be mobile and the potential to migrate under an imposed gradient, and its expression includes properties of the fluids and the soil.

Though LNAPL thickness in a well is related to LNAPL saturation in the adjacent formation, the observed thickness has little or no relationship to LNAPL transmissivity, without more information about the properties of the soil and fluids in the aquifer. The data shown on Figure 2, below, illustrate the uncertainty of LNAPL recoverability relative to thickness data. Without careful study, observed LNAPL thickness in a monitoring well is often misleading with respect to LNAPL recoverability.

Mr. Luis Changkuon
 23 May 2014
 Page 5

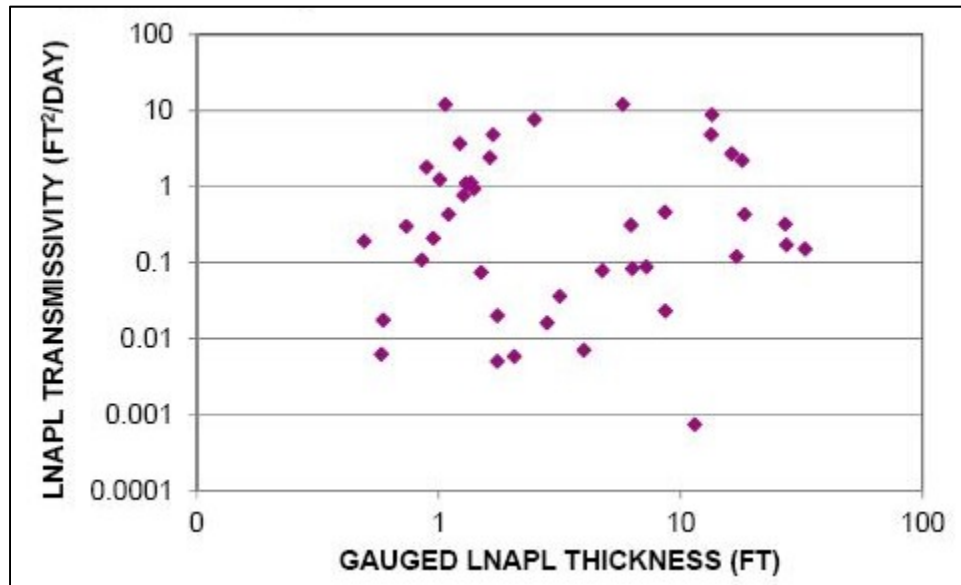


Figure 2. LNAPL thickness from multiple sites versus measured LNAPL transmissivity showing no relationship. LNAPL thickness for a given impact depends on hydrogeologic scenario, soil type, variability in water-table. From Hawthorne and Kirkman, 2011c.

Transmissivity has been cited by many practitioners and regulators as a useful performance metric for LNAPL cleanup decisions (API, [2007]; ITRC, [2009b]; ASTM, [2007]; Cho [2010]) because “transmissivity provides a consistent measure of recoverability... across different LNAPL plumes within a site or across different sites” (Cho, 2010). ITRC (2009b) recommends a minimum range of T_{LNAPL} over which LNAPL hydraulic recovery is considered to be feasible (0.1 to 0.8 ft²/day or greater). Hydraulic recovery of LNAPL at transmissivity lower than this range is considered to be infeasible.

Fortunately, several methods have been developed to estimate, model or measure T_{LNAPL} at a variety of scales. These methods include, in order or increasing scale of measurement from cubic centimeter to nearly plume-wide: (1) direct measurement of LNAPL flow through a soil core; (2) LNAPL baildown testing; (3) fluorescent dye tracer testing; (4) modeling LNAPL saturation from laser-induced fluorescence and other data; (5) soil and fluid physical properties data, and; (6) analysis of LNAPL recovery data.

LNAPL Behavior in Summary

- Some LNAPL (residual) is bound in pores and cannot move under any gradient;
- LARWQCB (2012) suggested that LNAPL at the GX-190 Site is recoverable in some wells because “results of the baildown testing reveal LNAPL in the tested wells recovered up to 48% of the pre-testing thickness”. However, as described above, the appearance of LNAPL as a floating thickness in a monitoring well is an unreliable indicator of either migrating LNAPL or recoverable LNAPL, and does not imply that recoverable LNAPL exists beneath the Site; furthermore, separate evaluations by CH2M

Mr. Luis Changkuon
 23 May 2014
 Page 6

Hill (2012a) and Geosyntec (described below) demonstrate the LNAPL transmissivity at the Site is too low to allow meaningful additional recovery;

- T_{LNAPL} is an appropriate metric for judging the recoverability of LNAPL and there are several ways to measure it.

LNAPL Transmissivity at the Site

CH2M Hill collected sufficient data to characterize T_{LNAPL} at the GX-190 site. Below, we highlight two observations and analyses which offer strong evidence of low T_{LNAPL} : long-term fluid level gauging in monitoring wells and recent LNAPL recovery history.

The fluid level gauging history shows an area of LNAPL impact that is smaller in 2013 than it was in 2010. By 2010, groundwater elevations had largely stabilized from its significant rise in prior years and more than 98% of all LNAPL volume recovery had occurred (CH2M Hill, 2010; 2014). This shows an LNAPL body that is without an ongoing source, is not migrating and is attenuating by natural means.

Geosyntec analyzed LNAPL recovery data from ongoing skimming activity starting in July, 2008 through 2013, after the cessation of soil vapor extraction so that the effects of hydraulic recovery on T_{LNAPL} could be evaluated separately. These data were analyzed to calculate the LNAPL transmissivity (T_n) for the Site using the following equation from API (2007):

$$T_n = Q_n \frac{\ln\left(\frac{R_c}{R_w}\right)}{\pi(1 - \rho_r) \sum b_n}$$

Where:

Q_n = LNAPL recovery rate

ρ_r = LNAPL-to-water density ratio

R_c = Radius of capture

R_w = Radius of well

b_n = LNAPL thickness observed in a monitoring well

Inputs were taken from Site monitoring and investigation data (CH2M Hill 2011a,b; 2012a,b; 2013a,b; 2014) and the radius of capture for each recovery well was very conservatively assumed to be 10 feet.

Results show a falling trend in Site-wide T_{LNAPL} from approximately 0.3 ft²/day in 2008 to 0.05 ft²/day in 2013. This analysis is based on LNAPL thickness and LNAPL volume recovery measurements from wells distributed across the LNAPL body. LNAPL transmissivity on Site

Mr. Luis Changkuon
 23 May 2014
 Page 7

has fallen below the minimum range of transmissivity (0.1 to 0.8 ft^2/day) where recovery is considered to be feasible (ITRC, 2009b).

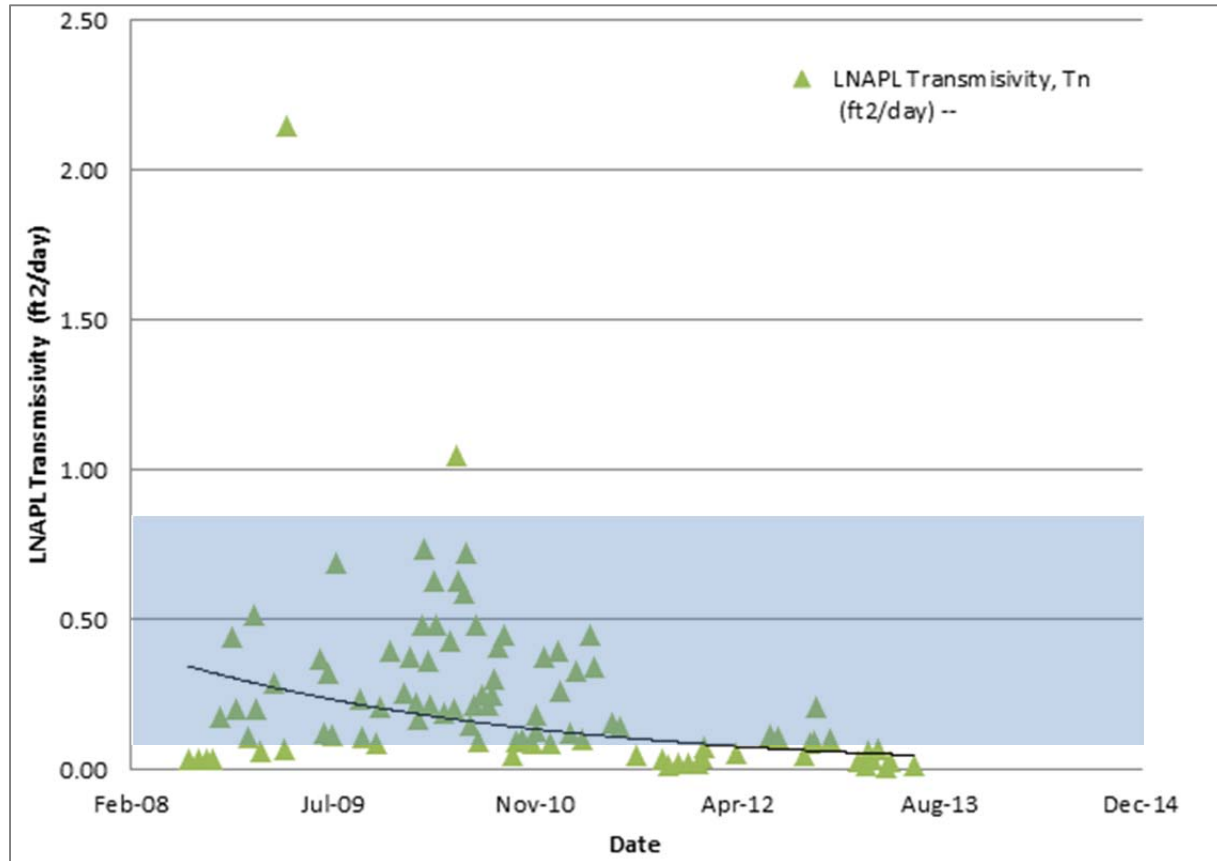


Figure 3. LNAPL transmissivity modeled from LNAPL recovery and thickness data from nine recovery wells distributed across the GX-190 Site. Shading indicates the minimum range of transmissivity where recovery is considered to be feasible from ITRC (2009b).

LNAPL Transmissivity at GX-190 in Summary

- The areal extent of the LNAPL body is shrinking and the LNAPL present is immobile; and
- T_{LNAPL} throughout the Site (now approximately 0.05 ft^2/day) is below the minimum range of transmissivity (0.1 to 0.8 ft^2/day) where recovery is considered to be feasible.

LNAPL Management Strategy is Supported by Site Data and Analyses

CH2M Hill concluded the following: (1) additional LNAPL recovery would provide insignificant or no incremental benefit to the time to achieve pre-release conditions for the Site; (2) that the LNAPL impacts are largely immobile with poor recoverability, and; (3) that dissolved hydrocarbons from the LNAPL body biodegrade within dozens of feet laterally and

Mr. Luis Changkuon
23 May 2014
Page 8

downgradient of the plume (CH2MHill 2011a, 2012a). Kinder Morgan plans to monitor groundwater at the Site to confirm the occurrence of natural attenuation; this monitoring strategy is consistent with California regulation under the LTCP and Resolution 92-49.

Applicability of the Low Threat Closure Policy

The LTCP addresses petroleum release scenarios from UST sites, and it indicates that non-UST sites with similar attributes to UST sites, such as releases from pipelines, like the release of jet fuel from the GX-190 Site, should have similar criteria for closure as under the LTCP. The LTCP describes several general criteria for closure which are all met at the Site:

- a. the area of concern is within the service area of a California Water Service Company;
- b. the release consists of only petroleum;
- c. release of jet fuel from the pipeline was stopped in the 1990s;
- d. a free product (LNAPL) recovery system has been operating since 2002 and LNAPL has been demonstrated to be immobile and not spreading into previously uncontaminated aquifer;
- e. a conceptual site model assessing the nature, extent and mobility of the release has been developed in multiple reports;
- f. the most readily recoverable fraction of source material has been recovered from the secondary source;
- g. groundwater has been tested for MTBE and the results have been reported to the Regional Board; MTBE and other gasoline oxygenate compounds detected in samples from the Site are not associated with the pipeline jet fuel release; and
- h. the impacts below the Site do not interfere with the comfortable enjoyment of life or property or affect an entire community or neighborhood through restriction of water use or by vapor intrusion (CH2M Hill, 2014; LARWQCB, 2014).

The Site also satisfies the three media-specific criteria:

1. Groundwater – as described above, the LNAPL impact is decreasing in areal extent and for a contaminant plume less than 1000 ft in length:
 - a. LNAPL is residualized and immobile;
 - b. the nearest groundwater supply well is more than half a mile upgradient; and
 - c. the dissolved concentrations of benzene and MTBE are less than 1 mg/L.
2. Vapor Intrusion – concentrations of all VOCs, including benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds), were below California Human Health Screening Levels (CHHSLs) for both residential and commercial/industrial land use scenarios in soil gas samples collected at approximately 5 feet bgs following completion of SVE system operation in 2008 (LARWQCB, 2014); and

Mr. Luis Changkuon
 23 May 2014
 Page 9

3. Direct contact and outdoor air exposure – the pipeline from which the release occurred has an invert of approximately 10 feet below ground surface; soil excavations have removed shallow impacts, and most remaining impacts are at depth; existing post-excavation soil data indicate neither a potential for direct contact due to their depth nor a potential for outdoor air exposure because shallow soil gas data showed BTEX concentrations below CHHSLs.

Furthermore, there is precedent in California under Regional Water Board authority for site closure with No Further Action for sites with measurable LNAPL thickness observed in a monitoring well just prior to closure. For example, the May McDonald Grace Trust at 802-806 Donahue Street in Santa Rosa, California was issued the No Further Action letter in the fall of 2013 based on a site remedy that combined excavation with monitored natural attenuation. This location was a former UST site where LNAPL had been observed in multiple monitoring wells for years prior to closure but the LNAPL was demonstrated to have limited migration potential and natural attenuation was shown to be occurring (CRA, 2011). No further monitoring was required as part of the remedy (North Coast RWQCB, 2013)."

LNAPL beneath the GX-190 Site exists in a stable, non-migrating LNAPL body that is submerged and trapped. This residual LNAPL consists of jet fuel depleted of BTEX compounds, and is not a source of fuel oxygenates (CH2M Hill, 2011a,b; 2012a,b; 2013a,b; 2014). Dissolved phase constituents of concern exceed maximum contaminant levels (MCLs) in the source area, but biodegrade immediately downgradient of the plume (CH2M Hill, 2012a). Not only is the plume stable and immobile, it does not pose a significant vapor intrusion risk; concentrations of all VOCs, including BTEX compounds, were below CHHSLs for both residential and commercial/industrial land use scenarios in soil gas samples collected in 2008 (LARWQCB, 2014).

Applicability of Resolution 92-49

Kinder Morgan is not seeking either a Low Threat Closure or a Containment Zone determination even though cleanup efforts have met the most stringent criteria for consideration of both. Several of these criteria are discussed below:

“The discharger is required to take all actions necessary to prevent the migration of pollutants beyond the boundaries of the containment zone in concentrations which exceed water quality objectives” (Section III.H)

As indicated above, more than a decade of product recovery has eliminated the migration of pollutants above water quality cleanup objectives beyond a well-defined and shrinking perimeter around the now residual LNAPL source.

the Regional Water Board must consider economic feasibility: “Economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of constituents of concern as compared with the incremental cost of achieving those reductions” (Section III.H.1.b);

Mr. Luis Changkuon
23 May 2014
Page 10

“The Regional Water Board may make determinations of technological or economic infeasibility after a discharger either implements a cleanup program pursuant to III.G. which cannot reasonably attain cleanup objectives, or demonstrates that it is unreasonable to cleanup to water quality objectives, and may make determinations on the basis of projection, modeling, or other analysis of site-specific data without necessarily requiring that remedial measures be first constructed or installed and operated and their performance reviewed over time unless such projection, modeling, or other analysis is insufficient or inadequate to make such determinations;” (Section III.H.1.c);

The Board does not offer an opinion or rationale on why the common findings of multiple studies about the unreasonableness of continued LNAPL recovery are unacceptable. These studies were based on analysis of site-specific data appropriate for the determination of LNAPL recoverability. CH2M Hill concluded that “there is no significant incremental benefit ... for the more-aggressive remedial alternatives ... despite the significant cost to implement them,” and that “it is not technically or economically feasible to achieve the alternative cleanup goals for some of the constituents of concern (TPH-g, TPH-d, TMB, and naphthalene), even after 100 years of natural attenuation” (CH2M Hill, 2012a).

“Floating free product must be removed to the extent practicable” (Section III.H.2.b).

CH2M Hill concluded that “there does not appear to be any significant incremental benefit in the time to achieve dissolved-phase cleanup goals within the submerged smear zone [by removing LNAPL]... relative to the No Action and No Further Action alternatives” (CH2M Hill, 2012a). Similarly, it is not feasible to achieve enough LNAPL removal to attain drinking water standards for all contaminants, even given 100-year timescales and potential net present value costs approaching \$50 million (CH2M Hill, 2012a). Taking No Action at the Site will remove an estimated 9 percent of the initial mass through biodegradation in 100 years. In the same time period mass removal estimates for LNAPL recovery, Airlift Sparging, In Situ Chemical Oxidation (ISCO), and Surfactant-Enhanced Remediation would remove an incremental 4 to 55 percent of the initial mass beyond biodegradation alone. Neither of these options will achieve dissolved-phase clean-up goals (CH2M Hill, 2012a).

“Where reasonable, removal of pollutant mass from ground water within the containment zone may be required, if it will significantly reduce the concentration of pollutants within the containment zone, the volume of the containment zone, or the level of maintenance required for containment.” (Section II.H.2.c)

Continued LNAPL recovery is not reasonable because time-to-clean-up modeling indicates that source longevity will not be significantly impacted by active remediation techniques when compared with no action. However, Kinder Morgan is planning to confirm the occurrence of natural attenuation as part of their management strategy (CH2M Hill, 2012a). This plan is consistent with Resolution 92-49 requirements.

Mr. Luis Changkuon
 23 May 2014
 Page 11

The Draft CAO Contains Numerous Inaccuracies and Lacks Feasible, Detailed Site Management Criteria such as LNAPL Recovery Endpoints

Numerous inaccuracies in the Draft CAO, noted below, make compliance neither feasible nor reasonable.

1. Background Item 3 (Page 1):

The depth to groundwater measurements in the monitoring network ranged from approximately 54 to 59 feet below grade in October 2013 (CH2M Hill, 2014).

2. Evidence of Waste Discharge and Basis for Section 13304 Order Item 6 (Page 2):

The second paragraph should more accurately describe historical soil and groundwater results as follows: *“Initial soil assessments were conducted in September 1995. Total petroleum hydrocarbons (TPH) as jet fuel (TPH-J) were detected at concentrations up to 24,000,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$) in the unsaturated zone and 60,000,000 $\mu\text{g}/\text{kg}$ at the soil/groundwater interface.”*

3. Evidence of Waste Discharge and Basis for Section 13304 Order Item 6 (Page 2):

The third paragraph should more accurately reflect the site history as follows:

“Groundwater investigations have been conducted at the site and vicinity since January 1996. Light nonaqueous phase liquid (LNAPL) was encountered with thickness up to 6.87 feet prior to remediation. TPH-J was detected in groundwater at concentrations up to 1,000,000 micrograms per liter ($\mu\text{g}/\text{L}$) prior to remediation.”

4. Evidence of Waste Discharge and Basis for Section 13304 Order Item 7 (Pages 2 & 3):

The last paragraph in Section 7 should more accurately reflect Kinder Morgan’s recent correspondences as follows:

“Since 1998, groundwater levels have been consistently rising in the LNAPL recovery wells, and ... On December 20, 2012, the Regional Board requested Kinder Morgan to submit a detailed remedial design and implementation plan for further LNAPL recovery (Plan). In reply, Kinder Morgan⁷ informed the Regional Board of their intention not to submit the requested Plan because, based on findings from the LNAPL Evaluation Report and Feasibility Study, additional LNAPL recovery is not reasonable because time-to-clean-up modeling indicates that source longevity will not be significantly impacted by active remediation techniques when compared with no action.”

Footnote 7 refers to Kinder Morgan’s, February 19, 2013 Letter in Response to Regional Board Letter dated December 20, 2012.

Mr. Luis Changkuon
23 May 2014
Page 12

5. Evidence of Waste Discharge and Basis for Section 13304 Order Item 8B (Page 3):

The summary of findings only includes constituent concentrations prior to site remediation activities and does not accurately describe current site conditions. The following sentence should be added to the end of Item 8B to reflect current conditions:

“Maximum concentrations detected in October 2013 in the source area are 2,000 µg/L TPH-g, 2,600 µg/L TPH-d, 48 µg/L benzene, 0.54 µg/L ethylbenzene, and 2.6 µg/L total xylenes; toluene was not detected. These constituents were not detected in any of the downgradient site monitoring wells in October 2013” (CH2M Hill, 2014).

6. Evidence of Waste Discharge and Basis for Section 13304 Order Item 8C (Page 3):

The following sentences should be added to the end of the first paragraph of Item 8C to reflect current conditions:

“Laser induced fluorescence studies show that LNAPL is present as a submerged smear zone beneath the site. The LNAPL pore fluid saturation measurements collected in 2012 ranged from 3.9 to 9.8 percent of pore volume (%PV); conservative estimates of residual LNAPL saturation in the same samples ranged from and 3.9 to 9.2 %PV” (CH2M Hill, 2011b).

Additionally, the text of this item should be modified to accurately reflect the average annual LNAPL recovery rate between 2006 and 2010 was 161 gallons.

7. Evidence of Waste Discharge and Basis for Section 13304 Order Item 8D (Page 3):

The following sentence should be added to the second paragraph to note the findings of the 2008 soil gas survey, in which the data were compared to CHHSLs:

“All benzene, toluene, ethylbenzene, and total xylenes concentrations detected in the soil gas survey were below industrial California Human Health Screening Levels (CHHSLs).”

8. Authority – Legal Requirements Item 14 (Page 4):

Item 14 includes excerpts from the California water code, including the following quote: *“In requiring those reports [technical or monitoring reports], the Regional Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”*

As noted above, an LNAPL Evaluation Report and a Feasibility Study were previously submitted, which concluded that additional LNAPL recovery was neither feasible nor would it provide significant incremental benefit. The RWQCB, in response, requested a detailed remedial design and implementation plan for further LNAPL recovery. In contrast to the requirements of the California Water Code Section 13267 (b)(1), the RWQCB did not provide written comments regarding deficiencies with either the LNAPL Evaluation Report or the Feasibility Study or

Mr. Luis Changkuon
23 May 2014
Page 13

provide evidence or rationale to support their request, or why Kinder Morgan's proposed action of continued LNAPL recovery and long term monitoring was inappropriate.

9. Conclusions – Item 24 (Page 6):

Item 24 states that: *“This Order promotes that policy by requiring Discharger to clean up the groundwater to meet drinking water standards.”*

The sentence should be revised to read, *“This Order promotes that policy by requiring Discharger to clean up the groundwater to meet drinking water standards to the extent practical.”*

10. Required Actions, Item 1 (Page 7):

Item 1 requires submittal of a Site Conceptual Model (SCM) including a written presentation with graphic illustrations (including cross-sections and plain [plan] view) of the discharge scenario, geology and hydrogeology, waste fate and transport in soil matrix, soil gas, and groundwater, distribution of wastes, exposure pathways, sensitive receptors and other relevant information.

A detailed site conceptual model was submitted to the RWQCB in the LNAPL Evaluation Report on November 14, 2011. This report included a description of Site geology and hydrogeology, the distribution of LNAPL and dissolved phase hydrocarbons, LNAPL mobility and recoverability, geologic cross-sections showing the distribution of LNAPL, plan view maps showing the distribution of LNAPL and dissolved phase hydrocarbons. Additionally, the current and future land use and beneficial use of groundwater were presented in the Feasibility Study submitted June 15, 2012. Consequently, this requirement has been addressed and submitted to the RWQCB. The RWQCB has not provided written comments regarding deficiencies in the SCM presented in these documents.

Kinder Morgan will submit a SCM update, if new, relevant information becomes available.

11. Required Actions, Item 2A (Page 7):

Item 2A requires submittal of a detailed remedial design and implementation plan for further LNAPL recovery and dissolved phase contamination, including preliminary remedial goals, discussion of alternate technologies, and a description of selection criteria. A Feasibility Study was previously submitted in June 2012 which proposed cleanup standards and contained an analysis of the time to cleanup, effectiveness, and cost for 10 potential remediation methods. As previously noted, the Regional Board has not provided technical evidence or rationale for their request, despite the requirements of the California Water Code Section 13267 (b)(1).

Preliminary cleanup goals required in Item 2A (i) were included on Page 4-1 of the Feasibility Study (CH2M Hill, 2012a). Item 2A (ii) requires alternative remedial technologies for the remediation of LNAPL and dissolved phase contamination. Ten alternatives were screened, and five of the ten alternatives were further evaluated for effectiveness, time to cleanup, and cost in

Mr. Luis Changkuon
23 May 2014
Page 14

the 2012 Feasibility Study, which concluded the current remedy is as effective as the alternative methods and proposed to continue with the current remedy. Thus, all of the items required in Item 2A have already been submitted to the RWQCB.

12. Attachment A (maps):

The most recent figures from the 2013 Second Semi-Annual 2013 Groundwater Monitoring Report, dated January 15, 2013 reflect the current Site conditions more accurately and should be used instead of maps from 2011.

13. Attachment B Item 1:

Item 1 of Attachment B requires development of a Site Conceptual Model. As previously noted above, the SCM was submitted in the LNAPL Evaluation Report on November 14, 2011 and further supplemented by the land use description and receptor information provided in the Feasibility Study submitted June 15, 2012.

14. Attachment B Item 2:

Item 2 of Attachment B requires submittal of a detailed remedial design and implementation plan for further LNAPL recovery, and plan implementation. As noted above, these requirements were previously fulfilled via submittal of the Feasibility Study which was submitted June 15, 2012.

15. Attachment B Item 3a:

Item 3 of Attachment B requires submittal of a Public Participation Plan. The due date should be replaced with the words, “to be determined, as necessary.” The Draft CAO states in Item 15 under Authority – Legal Requirements on page 4 that, “*The Regional Board may require the Discharger to submit a Public Participation Plan or engage in other activities to disseminate information...*” and in Item 15 under Required Actions on page 10 that, “*The Discharger shall prepare or update a Public Participation Plan when directed by the Executive Officer as necessary to reflect the degree of public interest...*” These are conditional and not obligatory statements.

16. Attachment C Monitoring and Reporting Program, Groundwater Monitoring:

To provide the flexibility to modify and optimize the groundwater monitoring program over time, the first paragraph should be modified to read as follows:

“The Discharger shall submit a groundwater monitoring plan for approval. The groundwater monitoring plan shall present the wells to be sampled, the monitoring frequencies for individual wells, sampling and gauging methods, and the laboratory analyses to be performed. The groundwater monitoring plan shall be revised periodically in response to changing site conditions and monitoring well network. The groundwater surface elevation (in feet above mean sea level [MSL]) shall be measured in all monitoring wells and used to determine the gradient and direction of groundwater flow.”

Mr. Luis Changkuon
 23 May 2014
 Page 15

17. Attachment C Monitoring and Reporting Program, Monitoring Frequencies:

The last word in the paragraph should be revised from “*necessary*” to “*warranted*”.

18. Attachment C Monitoring and Reporting Program, Reporting Requirements, Item 5:

Cross-sections are typically updated when new lithologic data are obtained. Consequently, the requirement to update cross-sections should be limited to occurrences when new lithologic or soil concentration data are collected. The text of Item 5 should be modified to read as follows:

“All monitoring or remediation progress reports shall include iso-concentration maps of TPH-diesel, TPH-gasoline, and benzene in plan view. TPH iso-concentration contours shall be provided on cross-sections with soil lithology data when the SCM is updated or when significant changes are observed.”

A CAO, if issued for a site with characteristics similar to the GX-190 site, should contain LNAPL recovery endpoints derived from a meaningful, science-based metric such as transmissivity that can be measured and documented through independent data and methods (e.g., modeling from core and laser-induced fluorescence, baildown tests and fluid recovery analysis). For years, transmissivity has been under serious consideration for use as a metric by LARWQCB staff, as evidenced by a presentation in 2010 and continuing staff service on the Scientific Review Board at the Applied NAPL Science Review (<http://www.h2altd.com/ansr>).

Site remediation goals for soil and groundwater including “cleanup to background” and “alternative levels that do not exceed numerical and narrative water quality objectives... including California MCLs” are neither reasonable nor feasible. Cleanup goals should be sufficiently detailed and reasonably achievable like the eight general and three media-specific criteria detailed above from the LTCF.

SUMMARY

The draft CAO indicates that additional LNAPL recovery and achievement of background conditions in the aquifer at the Site will be required if a CAO is issued. This does not appear to be consistent with Resolution 92-49 which requires, among other things, that,

“the Regional Board shall, ensure that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible...”

Rather, a CAO, if issued for a site with characteristics similar to that of the GX-190 site, should direct the discharger to collect sufficient data to support the existence of ongoing natural attenuation mechanisms in groundwater, to continue periodic monitoring of fluid elevations, and to monitor concentrations of target VOCs in downgradient groundwater annually to demonstrate continuing compliance. Additionally, if a CAO were to contain language requiring recovery of

Mr. Luis Changkuon
23 May 2014
Page 16

LNAPL, it should describe quantitative, measurable and achievable metrics and an endpoint for that recovery program.

Sincerely,



Mark Grivetti, P.G.
Principal



Todd N. Creamer, P.G.
Associate

Copies To: Scott Martin, Kinder Morgan
Richard Sturn, CH2M Hill

Attachment: References

Attachment: References
23 May 2014

REFERENCES

- American Petroleum Institute (API), 2007. LNAPL Distribution and Recovery Model (LRDM) Volume 1: Distribution and Recovery of Petroleum Hydrocarbon Liquids in Porous Media. API Publication 4760. January 2007.
- ASTM Standard E2531-06, 2007. Standard Guide for Development of Conceptual Site Models and Remediation Strategies for Light Nonaqueous-Phase Liquids Released to the Subsurface. ASTM International, West Conshohocken, PA. February 2007.
- CH2M Hill, 2010. First Semiannual 2010 Groundwater Monitoring Report, GX-190 Pipeline Release Site, SLIC No. 532A (Site ID 20415R00). July 15, 2010.
- CH2M Hill, 2011a. Second Semiannual 2011 Groundwater Monitoring Report, GX-190 Pipeline Release Site, SLIC No. 532A (Site ID 20415R00). January 13, 2012.
- CH2M Hill, 2011b. LNAPL Evaluation Report: Kinder Morgan Liquid Terminals, LLC, GX-190 Pipeline Release Site, Carson, California. November 14, 2011.
- CH2M Hill, 2012a. Feasibility Study: Kinder Morgan Liquid Terminals, LLC, GX-190 Pipeline Release Site, Carson, California. June 15, 2012.
- CH2M Hill, 2012b. First Semiannual 2012 Groundwater Monitoring Report, GX-190 Pipeline Release Site, Carson, California, July 13, 2012.
- CH2M Hill, 2013a. Second Semiannual 2012 Groundwater Monitoring Report, GX-190 Pipeline Release Site, Carson, California. January 14, 2013.
- CH2M Hill, 2013b. First Semiannual Groundwater Monitoring Report, GX-190 Pipeline Release Site, Carson, California. July 15, 2013.
- CH2M Hill, 2014. Second Semiannual 2013 Groundwater Monitoring Report, GX-190 Pipeline Release Site, Carson, California. January 15, 2014.
- Cho, Paul, 2010. LNAPL Transmissivity as a Metric: The Future in Tracking LNAPL Recovery Progress. LUST Technical Training Workshop: Tools for Petroleum Remediation Project Managers, San Diego, CA. June 8, 2010.
- Conestoga-Rovers & Associates, 2011. Revised Feasibility Study, Corrective Action Plan: May McDonald Grace Trust. January 20, 2011.
- Hawthorne, J.M. and A.J. Kirkman, 2011a. Residual, Mobile and Migrating LNAPL. Applied NAPL Science Review: Demystifying NAPL Science for the Remediation Manager, *1(10)*. December 2011.
- Hawthorne, J.M. and A.J. Kirkman, 2011b. LNAPL Transmissivity. Applied NAPL Science Review: Demystifying NAPL Science for the Remediation Manager, *1(7)*. July 2011.
- Hawthorne, J.M. and A.J. Kirkman, 2011c. Regulatory Acceptance of LNAPL Transmissivity as a Metric for LNAPL Recovery. International Petroleum and Biofuels Conference, Houston.

Attachment: References
23 May 2014

Interstate Technology & Regulatory Council (ITRC), 2009a. Evaluating Natural Source Zone Depletion at Sites with LNAPL. April 2009.

Interstate Technology & Regulatory Council (ITRC), 2009b. Evaluating LNAPL Remedial Technologies for Achieving Project Goals. December 2009.

Los Angeles Regional Water Quality Control Board (LARWQCB), 2012. Comments on LNAPL Evaluation Report and Request to Submit a Feasibility Study/Evaluation of Other Remedial Alternatives, GX-190 Pipeline Release Site, 900 Block of East 233rd Street, Carson, California (SCP No. 0532A, Site ID No. 2045R00). February 25, 2012.

Los Angeles Regional Water Quality Control Board (LARWQCB), 2014. Draft Cleanup and Abatement Order No. R4-2014-00XX. April 2014.

Newell, C.J, S.D. Acree, R.R. Ross, and S.G. Huling, 1995. Light Nonaqueous Phase Liquids. U.S. Environmental Protection Agency, Washington, DC. EPA/540/S-95/500 (NTIS 95-267738).

North Coast Regional Water Quality Control Board, 2013. Request for Monitoring Well Destruction, Grace Property. July 2, 2013.

Remediation Technologies Development Forum (RTDF), 2005. The Basics: Understanding the Behavior of Light Non-Aqueous Phase Liquids (LNAPLs) in the Subsurface. February 2005.

State Water Resources Control Board (SWRCB), 1996. Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304. Resolution No. 92-49.

State Water Resources Control Board (SWRCB), 2012. Low-Threat Underground Storage Tank Closure Policy. Resolution No. 2012-16.

1 KATHARINE E. WAGNER (Bar No. 119429)
2 Katharine E. Wagner, Attorney
3 777 Campus Commons Dr., Suite 200
4 Sacramento, CA 95825
5 Telephone: (916) 996-1744
6 Email: Katharine@kewagnerlaw.com

7
8 Attorney for Petitioner
9 KINDER MORGAN ENERGY PARTNERS, L.P.

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
BEFORE THE
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of Kinder Morgan Energy Partners, L.P.'s, Petition for Review of Action by the Los Angeles Regional Water Quality Control Board's Issuance of Cleanup and Abatement Order No. R4-2015-0009 and Request for Stay.

AFFIDAVIT OF RICHARD STURN IN SUPPORT OF KINDER MORGAN ENERGY PARTNERS, L.P. PETITION FOR REVIEW AND REQUEST FOR STAY [WATER CODE §§ 13320-13321]

I, Richard Sturn, hereby declare and state as follows:

4. I am a Senior Hydrologist with CH2M HILL Engineers, Inc. (CH2M HILL), and a licensed Professional Geologist in California with ten years' experience in the field of remediation.

5. Attached as Exhibit A is a true and correct copy of a Technical Letter I have prepared, dated February 27, 2015, and titled *Initial Activities to Comply with Cleanup and Abatement Order NO. R4-2015-0009* (the CH2M HILL Technical Letter). As shown by his joint execution of the CH2M HILL Technical Letter, I have prepared this letter in collaboration with CH2M HILL Senior Chemical Engineer, Bill Breedlove, P.E., a California licensed Professional Engineer.

6. The CH2M HILL Technical Letter summarizes the initial activities required to comply with the Cleanup and Abatement Order, Order No. R4-2015-0009 (CAO) of the Los Angeles Regional Water Quality Control Board (Regional Board), including development and submission of a Site Conceptual Model and Public Participation Plan, Development and submission of a Detailed Remedial

1 Design and Implementation Plan (RAP) for further light non-aqueous phase (LNAPL) recovery, and
2 implementation of the RAP. The CH2M HILL Technical Letter includes costs for pilot testing, which
3 would be performed before submitting the RAP to evaluate the effectiveness of selected remedial
4 technologies and to develop design parameters for full scale implementation.

5 7. I am the CH2M HILL Senior Hydrogeologist in responsible charge of site characterization
6 and remedial activities at the site referred to by the Regional Board as the GX-Pipeline Release Area,
7 900 Block of East 233rd Street, Carson, California (Site).

8 8. I am familiar with the soil and groundwater conditions and remediation activities at the
9 Site, including operation of the LNAPL recovery system, based on firsthand involvement as Senior
10 Hydrogeologist on the remediation project over the past 4 years. I am familiar with the remediation
11 project documents submitted on behalf of Kinder Morgan Energy Partners, L.P. regarding the Site.

12
13 I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

14 Executed February 27, 2015, in Santa Ana, California

15
16
17 By: 

RICHARD STURN, P.G.



CH2M HILL
6 Hutton Centre Drive
Suite 700
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

February 27, 2015

Katharine E. Wagner, Attorney
777 Campus Commons Drive, Suite 200
Sacramento, California 95825

Subject: Initial Activities to Comply with Cleanup and Abatement Order NO. R4-2015-0009

Dear Ms. Wagner:

CH2MHILL Engineers, Inc. (CH2M HILL) has prepared this letter on behalf of Kinder Morgan Energy Partners, L.P. (KMEP) to provide a summary of initial activities required to comply with Cleanup and Abatement Order No. R4-2015-0009 (CAO), a preliminary schedule for their implementation, and their approximate cost. This evaluation focuses on activities that would be completed within the first four years of the program.

CAO Requirements

The CAO directs KMEP to perform the following tasks:

- Develop and Submit a Conceptual Site Model (CSM)
- Submit and Implement a Public Participation Plan (PPP)
- Develop and submit a Detailed Remedial Design and Implementation Plan (RAP) for further light non-aqueous phase (LNAPL) recovery
- Implement the RAP

The CAO requires submittal of the CSM and PPP documents on or before April 30, 2015 and May 15, 2015, respectively. The CAO does not include a defined submittal date for the RAP, requiring submittal "according to the schedule specified by the Executive Officer".

Although not specifically required in the CAO, pilot testing would be performed before submitting the RAP to evaluate the effectiveness of selected remedial technologies under site conditions and to develop design parameters for full scale implementation. In addition, a common theme of the Regional Water Quality Control Board's (RWQCB's) responses to KMEP's comments on the draft version of the CAO was that pilot testing is needed to substantiate the findings of the June 15, 2012 Feasibility Study (FS), prepared by CH2M HILL. The FS concluded that further LNAPL recovery was not feasible. The FS included a preliminary screening of remedial technologies and detailed evaluation of remedial alternatives utilizing three technologies: air-lift recirculation (air sparing), surfactant enhanced fluids recovery (SER), and in-situ chemical oxidation (ISCO). CH2M HILL assumes pilot testing of each technology would be performed prior to submitting the RAP for RWQCB approval.

Preliminary Schedule

Exhibit 1 illustrates a preliminary schedule for implementation of the initial activities (preparation of the CSM and the PPP, pilot testing, and preparation of the RAP). The schedule assumes the pilot tests would be implemented sequentially and would need to be relatively long-term (6 to 12 months long) to assess effectiveness of each technology. The preliminary schedule also includes time for preparation of plans, reports, and regulatory review.

EXHIBIT 1

Preliminary Implementation Schedule

Task	2015				2016				2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
CSM	■	■	■													
PPP		■	■	■												
Pilot testing - (Air Sparging)			■	■	■	■										
Pilot testing - (SER)					■	■	■	■	■	■	■					
Pilot testing - (ISCO)									■	■	■	■	■			
RAP														■	■	■

Estimated Costs

Exhibit 2 summarizes the anticipated cost for each of these activities and the basis of the cost estimate. Exhibit 3 presents a combined annual cash flow estimate through 2018 for these tasks.

EXHIBIT 2

Estimated Costs for Initial Tasks

Task	Cost	Basis of Estimate
CSM	\$22,780	Currently Contracted Work
PPP	\$26,980	Currently Contracted Work
Pilot testing - Air Sparging	\$350,000	Conceptual cost, modified from CH2M HILL FS (2012)
Pilot testing - SER	\$315,000	Conceptual cost, modified from CH2M HILL FS (2012)
Pilot testing - ISCO	\$413,000	Conceptual cost, modified from CH2M HILL FS (2012)
RAP	\$75,000	Engineer Estimate

EXHIBIT 3

Estimated Cash Flow Costs Through 2018

Year	Estimated Annual Cost
2015	\$284,010
2016	\$358,229
2017	\$478,521
2018	\$82,000

KATHARINE E. WAGNER
PAGE 3
FEBRUARY 27, 2015

If you have any questions or comments regarding the estimated costs or schedule described herein, please contact Richard Sturn at (714) 435-6028.

Sincerely,

CH2M HILL Engineers, Inc.



Richard Sturn, P.G.
Senior Hydrogeologist



GX-190_CAO_Cost_Detail.docx

cc: Scott Martin/KMEP
Nancy Van Burgel/KMEP



Bill Breedlove, P.E.
Senior Chemical Engineer

