

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

MONITORING AND REPORTING PROGRAM NO. CI-8913
FOR
CONOCOPHILLIPSCOMPANY
(76 STATION 4330)
(OZONE INJECTION FOR GROUNDWATER CLEANUP)

ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. R4-2005-0030 (Series No. 005)

I. REPORTING REQUIREMENTS

- A. ConocoPhillips Company (hereinafter Discharger) shall implement this monitoring program on the effective date of this enrollment under Regional Board Order No. R4-2005-0030. The first monitoring report under this Program is due by October 15, 2005.

Monitoring reports shall be received by the dates in the following schedule:

<u>Reporting Period</u>	<u>Report Due</u>
January – March	April 15
April – June	July 15
July – September	October 15
October – December	January 15

- B. If there is no discharge or injection during any reporting period, the report shall so state. Monitoring reports must be addressed to the Regional Board, Attention: Information Technology Unit.
- C. By January 30 of each year, beginning January 30, 2006, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall explain the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements (WDRs).
- D. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and the corrective actions taken or planned that may be needed to bring the discharge into full compliance with WDRs. This section shall be located at the front of the report and shall clearly list all non-compliance with discharge requirements, as well as all excursions of effluent limitations.
- E. The Discharger shall comply with requirements contained in Section G of Order No. R4-2005-0030 "*Monitoring and Reporting Requirements*" in addition to the aforementioned requirements.

II. OZONE INJECTION MONITORING REQUIREMENTS

The quarterly reports shall contain the following information regarding injection activities:

1. Location map showing injection points used for the ozone.
2. Written and tabular summary defining the quantity of ozone injected per month to the groundwater and a summary describing the days on which the injection system has been operating:

CONSTITUENT	UNITS*	TYPE OF SAMPLE	MINIMUM FREQUENCY OF ANALYSIS
Total ozone delivered per injection point	grams/day	--	<ul style="list-style-type: none"> • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter

III. GROUNDWATER MONITORING PROGRAM

A groundwater-monitoring program shall be designed to detect and evaluate impacts associated with the injection activities (ozone). The Discharger shall sample upgradient wells B-6, B-7, B-10, and B-11; downgradient wells B-8, B-16, B-17, and B-18; and source wells B-1, B-2, B-3, B-4, B-5, B-9, and B-13 to provide groundwater quality information prior to and after the ozone injection. These sampling stations shall not be changed and any proposed change of monitoring locations shall be identified and approved by the Regional Board Executive Officer (Executive Officer) prior to their use. Groundwater from the wells noted above shall be monitored for the duration of the remediation in accordance with the following discharge monitoring program:

CONSTITUENT	UNITS ¹	TYPE OF SAMPLE	MINIMUM FREQUENCY OF ANALYSIS
Total petroleum hydrocarbons as gasoline (TPHg)	µg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	µg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3

			months
			<ul style="list-style-type: none"> • Quarterly thereafter
Methyl tertiary butyl ether (MTBE), Tertiary butyl alcohol (TBA), Tertiary amyl methyl ether (TAME), Di-isopropyl ether (DIPE), Ethyl tertiary butyl ether (ETBE), (formaldehyde & acetates)	µg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Ethanol	µg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Total dissolved solids Chloride Sulfate	mg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Oxidation-reduction potential	milivolts		<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Dissolved Oxygen	µg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Dissolved ferrous iron	µg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Total Chromium and chromium (VI) ²	µg/L	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter

PH	pH units	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Temperature	⁰ F/ ⁰ C	Grab	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter
Groundwater Elevation	Feet, mean sea level and below ground surface	In situ	<ul style="list-style-type: none"> • 1 week before injection • Bi-weekly for the first month following injection • Monthly for the next 3 months • Quarterly thereafter

¹ µg/l - micrograms per liter

² The Discharger is required to monitor for total chromium and chromium six if total chromium is detected in the baseline samples. The monitoring is required only for the well(s) that the total chromium was detected.

All groundwater monitoring reports must include, at a minimum, the following:

- a. Well identification, date and time of sampling;
- b. Sampler identification, and laboratory identification;
- c. Quarterly observation of groundwater levels, recorded to 0.01 feet mean sea level and groundwater flow direction.

IV. 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 to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

V. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly

ConocoPhillips
(76 Station 4330)
Monitoring and Reporting Program No. CI-8913

File No. R-24759
Order No. R4-2005-0030

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 a fine and imprisonment.

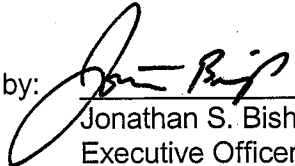
Executed on the _____ day of _____ at _____.

(Signature)

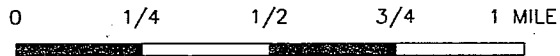
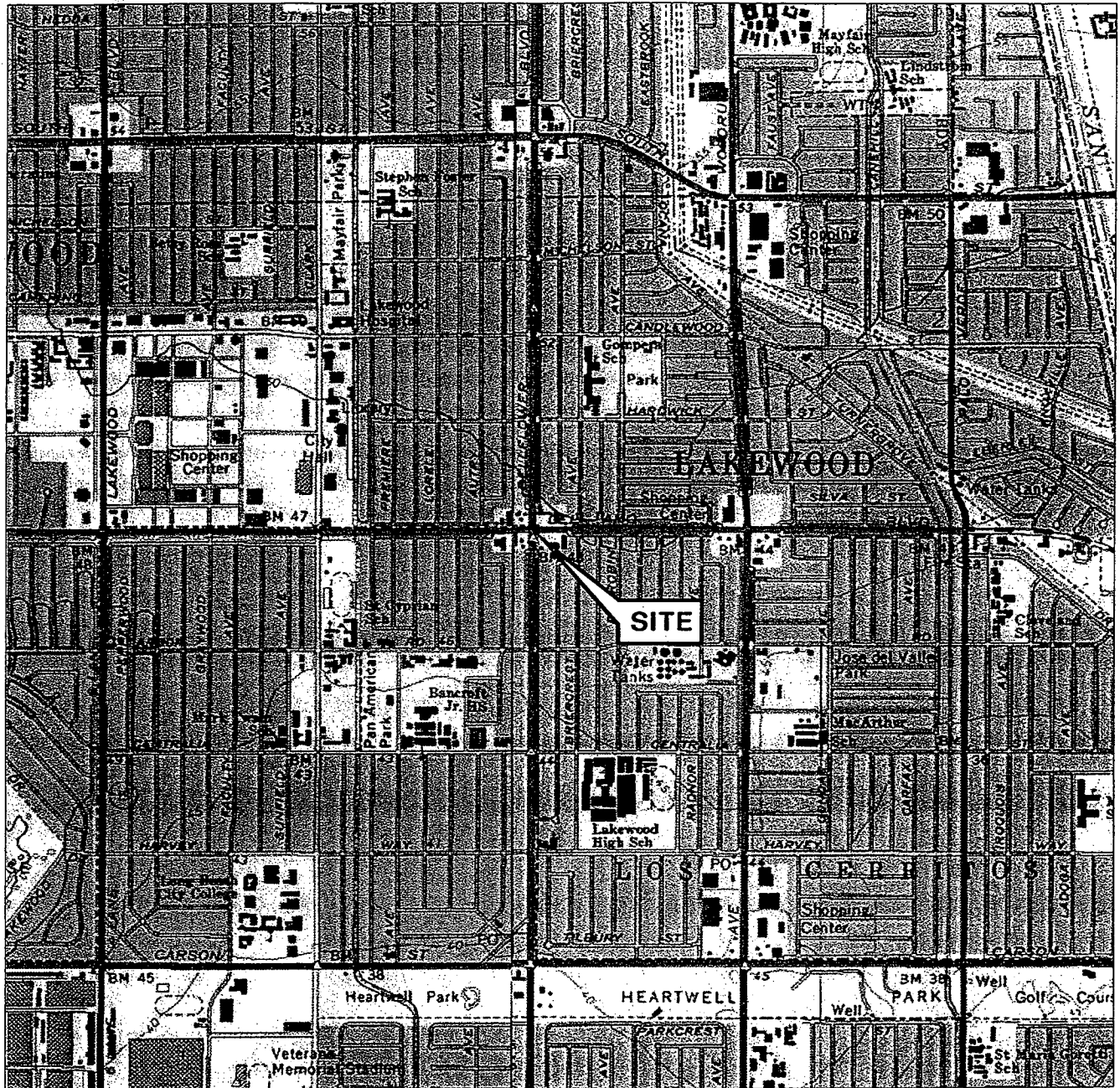
(Title)"

All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger, will be treated as confidential.

Ordered by:


Jonathan S. Bishop
Executive Officer

Date: July 6, 2005



SCALE 1:24,000

SOURCE:

United States Geological Survey
7.5 Minute Topographic Map:
Los Alamitos Quadrangle



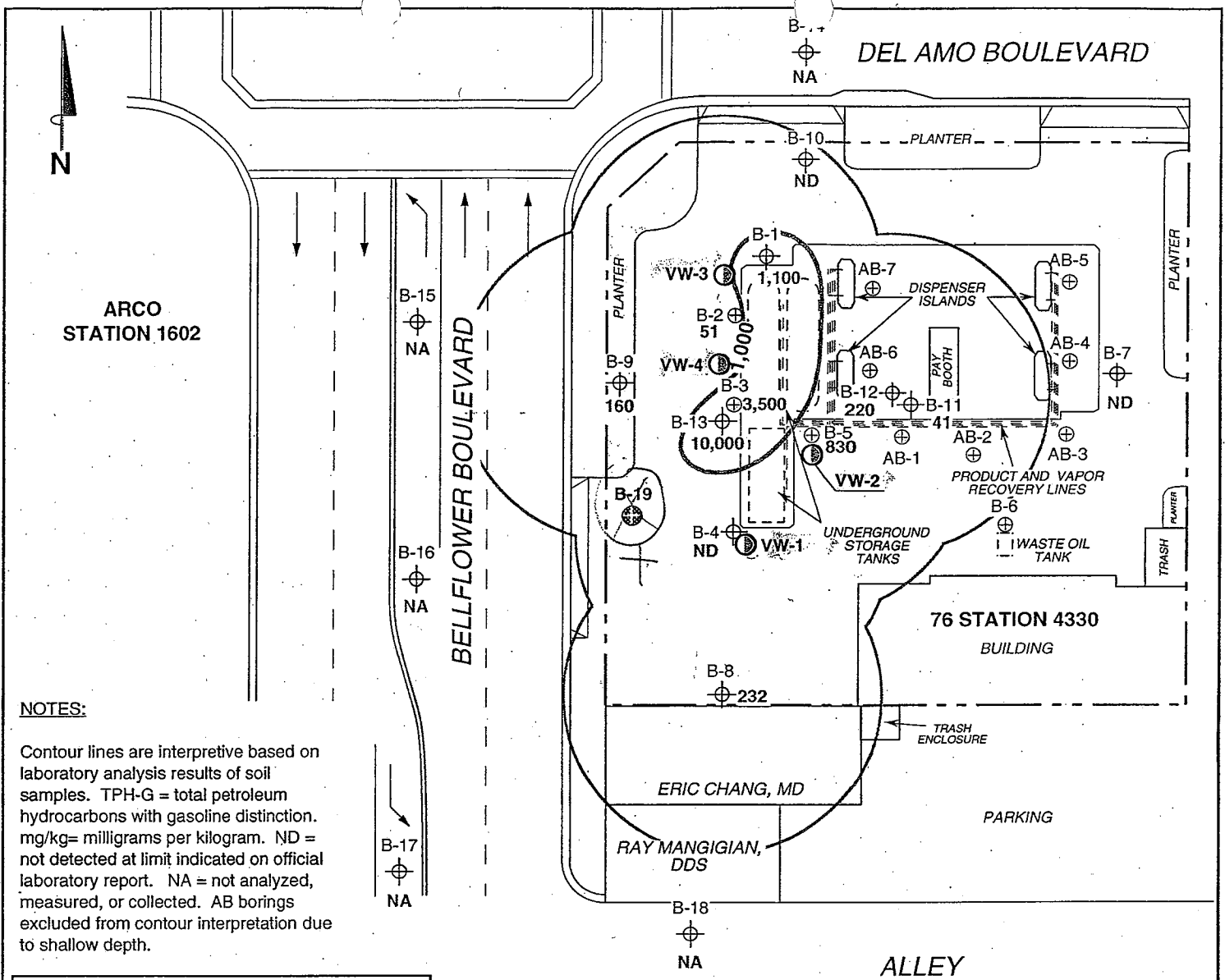
SITE LOCATION MAP

76 Station 4330
4870 Bellflower Boulevard
Lakewood, California

FIGURE 1

TRC

PS = 1:1



NOTES:

Contour lines are interpretive based on laboratory analysis results of soil samples. TPH-G = total petroleum hydrocarbons with gasoline distinction. mg/kg= milligrams per kilogram. ND = not detected at limit indicated on official laboratory report. NA = not analyzed, measured, or collected. AB borings excluded from contour interpretation due to shallow depth.

LEGEND

B-18 ⊕ Monitoring Well with TPH-G Concentration (mg/kg)

AB-7 ⊕ Boring

B-19 ⊕ Proposed Boring

VW-4 ⊕ Proposed Vapor Extraction Well

1,000 --- Maximum TPH-G Contour (mg/kg)



Area of Anticipated Vapor Extraction Influence

MAXIMUM TPH-G IN SOIL and VAPOR EXTRACTION AREA OF INFLUENCE MAP

76 Station 4330
4870 Bellflower Boulevard
Lakewood, California

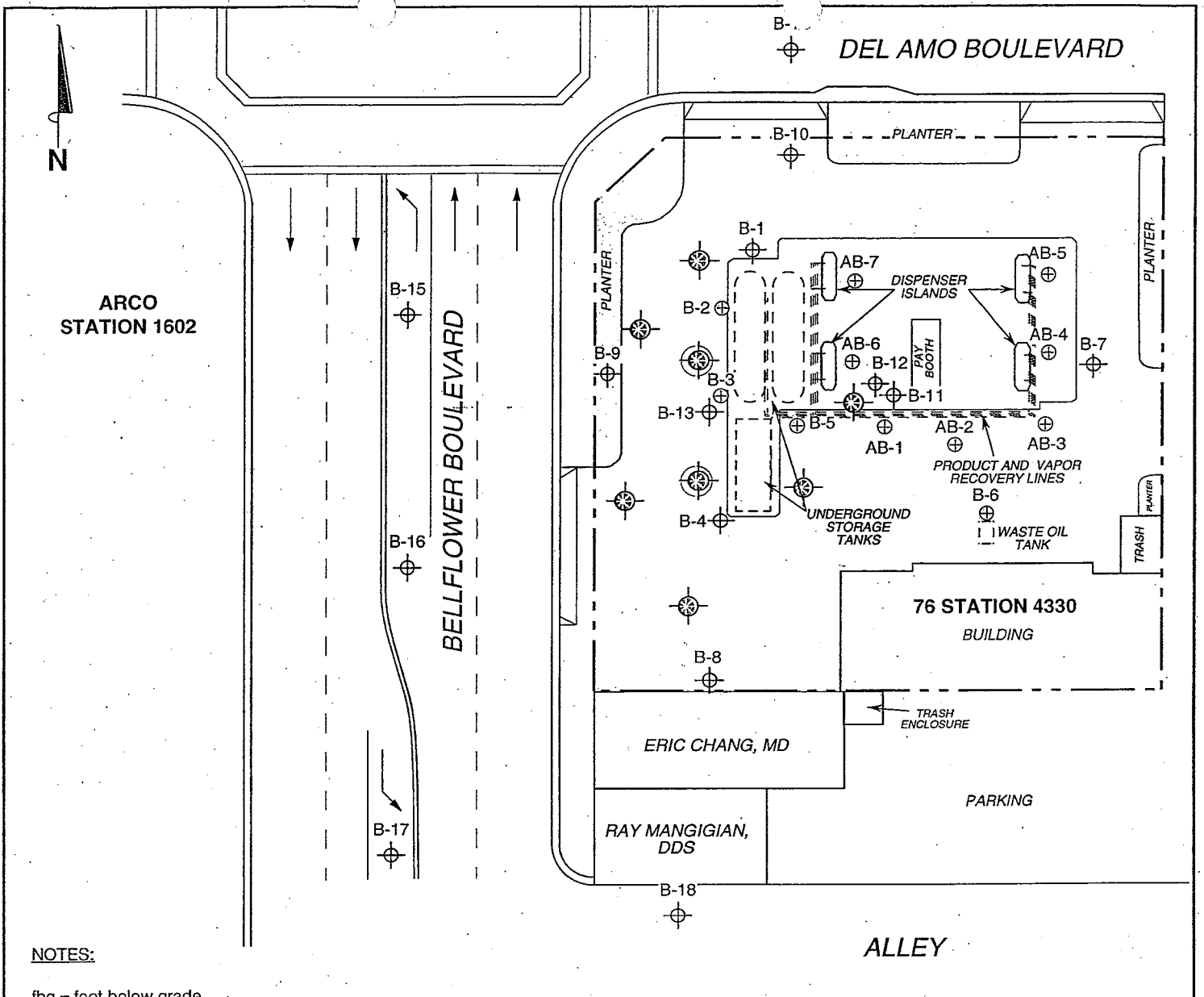


SCALE (FEET)



0 40





FIGURE 3/2



NOTES:

fbg = feet below grade.
 Modified from maps provided by GroundWater Technology, Inc., dated 04/28/1992, and England Geosystem, dated 03/09/01.

LEGEND

-  Proposed Sparge Point
-  Proposed Nested Sparge Point
- B-18  Monitoring Well
- AB-7  Boring

SITE PLAN SHOWING PROPOSED SPARGE POINTS

76 Station 4330
 4870 Bellflower Boulevard
 Lakewood, California

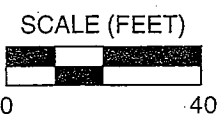


FIGURE 4 3



California Regional Water Quality Control Board

Los Angeles Region



Alan C. Lloyd, Ph.D.
Agency Secretary

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

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Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.waterboards.ca.gov/losangeles>

Arnold Schwarzenegger
Governor

July 6, 2005

Mr. Chris Swartz
ConocoPhillips Company
3611 Harbor Boulevard Suite 200
Santa Ana, CA 92704

Dear Mr. Swartz:

GENERAL WASTE DISCHARGE REQUIREMENTS FOR OZONE INJECTION AT PETROLEUM HYDROCARBON FUEL AND/OR VOLATILE ORGANIC COMPOUND IMPACTED SITES – 76 STATION 4330, 4870 BELLFLOWER BOULEVARD, LAKEWOOD (UST FILE NO. R-24759) (ORDER NO. R4-2005-0030, SERIES NO. 005; CI NO. 8913)

We have completed our review of your application for coverage under General Waste Discharge Requirements for the injection of ozone at the site referenced above in Lakewood, California.

Following leak detection investigations from March 1992 to December 2004, numerous corrective activities were conducted at the site. During these activities several groundwater monitoring wells, vapor extraction wells and C-spargersTM points were installed at the site. The results of these investigations indicated that the underlying soil and groundwater had been contaminated with volatile organic compounds (VOCs). The highest concentration of total petroleum hydrocarbon as gasoline (TPHg), benzene, and methyl tertiary butyl ether (MTBE) detected in the soil were 3,500 milligrams per kilogram (mg/Kg), 38 mg/Kg, and 150 mg/Kg, respectively. Maximum groundwater hydrocarbon concentrations were 35,000 micrograms per liter ($\mu\text{g/L}$) TPHg (B-13), 9,200 $\mu\text{g/L}$ benzene (B-12), 2,700 $\mu\text{g/L}$ toluene (B-12), 2,000 $\mu\text{g/L}$ ethylbenzene (B-4), 2,900 $\mu\text{g/L}$ total xylenes (B-12), 17,000 $\mu\text{g/L}$ MTBE (B-4), 35,000 $\mu\text{g/L}$ tertiary butyl alcohol (TBA) (B-4).

On June 21, 2004, Board staff approved the "Feasibility Testing Report and Remediation Action Plan" dated February 13, 2004. In the Remedial Action Plan, the Discharger proposed to use a combination of soil vapor extraction (SVE) and air sparging (C-SpargerTM Technology) to remediate hydrocarbons in soil and dissolved-phase fuel constituents in groundwater. The C-SpargerTM technology combines low-flow [3 to 5 cubic feet per minute (cfm)] air sparging with ozonation to oxidize petroleum hydrocarbons into benign byproducts, carbon dioxide and water.

Ozone is generated onsite using a control panel with a built-in compressor and ozone generator. Using perforated sparge points, microbubbles [10 to 50 micrometer (μm)] of encapsulated ozone are introduced below the water table, where the oxidation reactions take place. Eight C-SpargerTM injection wells will be installed onsite within the dissolved-phase plume (Figure 3) and two sparge points will be nested in the same borehole to allow for sparging at different depths below water table. The C-SpargerTM injection wells will be located at approximately 38 feet below ground (fbg) and 50 fbg, respectively. During sparging, no

California Environmental Protection Agency



Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

Mr. Chris Swartz
ConocoPhillips Company
(76 Station 4330)

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July 6, 2005

groundwater or vapors will be extracted. Sparging will be performed on a cycled basis for 5 to 10 minutes.

Board staff have determined that the proposed injection of ozone meets the conditions specified in Order No. R4-2005-0030, "General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel and/or Volatile Organic Compound Impacted Sites," adopted by this Regional Board on May 5, 2005.

Enclosed are your Waste Discharge Requirements, consisting of Regional Board Order No. R4-2005-0030 (Series No. 005) and Monitoring and Reporting Program No. CI-8913 and Standard Provisions.

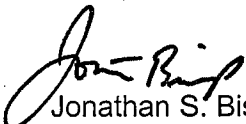
The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of this enrollment (October 15, 2005) under Regional Board Order No. R4-2005-0030. All monitoring reports shall be sent to the Regional Board, ATTN: Information Technology Unit.

When submitting monitoring or technical reports to the Regional Board per these requirements, please include a reference to Compliance File No. CI-8913, which will assure that the reports are directed to the appropriate file and staff. Do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

We are sending a copy of Order No. R4-2005-0030 only to the applicant. A copy of the Order will be furnished to anyone who requests it.

If you have any questions, please contact Mr. Rod Nelson at (213) 620-6119.

Sincerely,


Jonathan S. Bishop
Executive Officer

Enclosures: 1. Board Order No. R4-2005-0030
2. Monitoring and Reporting Program No. CI-8913

Cc: Ms. Yvonne Shanks, SWRCB, Underground Storage Tank Cleanup Fund
Ms. Nancy Mastumoto, Water Replenishment District of Southern California
Mr. Tim Smith, LACoDPW, Environmental Programs Division, Underground Tanks
Mr. Bryen Woo, TRC Customer-Focused Solutions

California Environmental Protection Agency



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