



# California Regional Water Quality Control Board

## Los Angeles Region



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

Linda S. Adams  
Agency Secretary

320 W. 4th Street, Suite 200, Los Angeles, California 90013  
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Arnold Schwarzenegger  
Governor

CI 9417

March 5, 2008

Mr. Kyle A. Christie  
Environmental Business Manager  
Atlantic Richfield Company (a BP affiliated company)  
6 Centerpointe Drive, LPR6-161  
La Palma, CA 90623-1066

Certified Mail  
Return Receipt Requested  
Claim No. 7006 3450 0002 4641 9296

**GENERAL WASTE DISCHARGE REQUIREMENTS COVERAGE FOR PILOT TEST TO INJECT ORGANIC SUBSTRATE (ORDER NO. R4-2007-0019: SERIES NO. 022) GROUNDWATER REMEDIATION PILOT STUDY, BP CHEMICAL, 1600 WEST 135<sup>TH</sup> STREET, GARDENA, CALIFORNIA (SCP # 0470) (SITE ID # 2047900)**

Dear Mr. Christie:

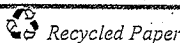
We have completed our review of your application for coverage under the General Waste Discharge Requirements to conduct a pilot test to evaluate the effectiveness of organic substrate addition to enhance the *in-situ*, biological reductive dechlorination of chlorinated aliphatic hydrocarbons (CAHs) present in groundwater to non-toxic end products, at the former BP Chemical facility, located at 1600 West 135<sup>th</sup> Street, Gardena, California (Site).

British Petroleum (BP) proposes to conduct a pilot test that will consist of (1) aquifer pumping tests, (2) injection of bio-enhancement substrate, and (3) performance monitoring, to evaluate the effectiveness of organic substrate distribution into the near surface aquifers to enhance the native bacterial reductive dechlorination of chlorinated solvents in groundwater, to non-toxic end products. On June 12, 2007, the Regional Board approved the "*Treatability Pilot Test Workplan, Former BP-HITCO Facility, 1600 West 135<sup>th</sup> Street, Gardena, California, (Workplan)*" dated March 16, 2007.

The injection phase of the pilot test will consist of addition of organic substrate into the 30-foot silty sand zone and the 50-foot silty sand zone present beneath the Site. The substrate that is proposed to be injected will consist of a commercially available emulsified soy oil, known as EOS<sup>TM</sup> that contains 4% sodium lactate and minor amounts of ammonia-N, phosphate, yeast extract, and vitamin B. The EOS<sup>TM</sup> will be mixed with makeup water or formation water, using groundwater produced from the pumping test, stored in plastic tanks, and injected into the 30-foot silty sand as well as the 50-foot silty sand zone. Performance monitoring will consist of baseline sampling prior to injection and subsequent monitoring of wells after completion of injection.

Regional Board staff has reviewed the information provided and has determined that the proposed discharge meets the conditions specified in Regional Board Order No. R4-2007-0019, "General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel, Volatile Organic

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Mr. Kyle A. Christie  
The Atlantic Richfield Company

- 2 -

March 5, 2008

Compound and/or Hexavalent Chromium Impacted Sites," adopted by this Regional Board on March 1, 2007.

Enclosed are your Waste Discharge Requirements consisting of Regional Board Order No. R4-2007-0019 (Series No. 022), Monitoring and Reporting Program No. CI-9286.

The "Monitoring and Reporting Program" requires you to implement the monitoring and reporting program on the effective date of this enrollment (March 2008) under Regional Board Order No. R4-2007-0019. All monitoring reports shall be sent to the Regional Board, ATTN: Information Technology Unit.

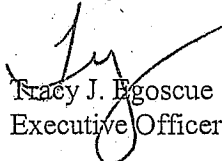
When submitting monitoring or technical reports to the Regional Board, per these requirements, please include a reference to "Compliance File No. CI-9286," which will assure that the reports are directed to the appropriate file and staff. Also, please do not combine other reports with your monitoring reports. Please submit each type of report as a separate document. We are including a copy of Order No. R4-2007-0019 for the applicant only. A copy of the order will be furnished to anyone who requests it.

A technical report documenting the effectiveness of the Pilot Test program shall be submitted and reviewed by Regional Board staff prior to expanding the cleanup program. The technical report is to contain all data generated and materials used during the Pilot Test. The technical report is also to include an evaluation of the cleanup technology and any modifications to the injection and monitoring system, which may be needed for full scale operation. The technical report shall contain the locations, number, and depths of additional injection points, and the locations of multi-depth groundwater monitoring wells required for monitoring the upgradient area, source area, and downgradient area, for full scale operation of the cleanup plan.

Prior to full scale operation of the cleanup plan, these Waste Discharge Requirements will need to be revised to incorporate the additional injection points and monitoring locations necessary for full scale cleanup.

**Should you have any questions related to this project, please contact Pinaki R. Guha-Niyogi at (213) 576-6731, or Dixon Oriola at (213) 576-6803 or you can send e-mails to [pguha@waterboards.ca.gov](mailto:pguha@waterboards.ca.gov) or [doriola@waterboards.ca.gov](mailto:doriola@waterboards.ca.gov), respectively.**

Sincerely,

  
Tracy J. Egoscue  
Executive Officer

Enclosures: 1) Regional Board Revised General WDR Requirements, Order No. R4-2007-0019  
2) Monitoring and Reporting Program No. CI-9286

cc: Mr. Devin Thor, Parsons, Pasadena, CA  
Mr. Paul Farmanian, Parsons, Pasadena, CA

**California Environmental Protection Agency**



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

MONITORING AND REPORTING PROGRAM NO. CI-9286 9417  
FOR  
BP CHEMICAL

ENROLLMENT UNDER REGIONAL BOARD  
ORDER NO. R4-2007-0019 (Series No. 022)  
FILE NO. 07-182

I. REPORTING REQUIREMENTS

- A. BP Chemical (hereinafter Discharger) shall implement this monitoring program on the effective date of this enrollment (March 5, 2008) under Regional Board Order No. R4-2007-0019. The first monitoring report under this Program is due by **April 15, 2008**.

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 **March 1** of each year, 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. R4-2007-0019 "Monitoring and Reporting Requirements" in addition to the aforementioned requirements.

Standard Provisions Applicable to  
Waste Discharge Requirements

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. [CWC Sections 13263, 13267, and 13268]"

20. OPERATOR CERTIFICATION

Supervisors and operators of municipal wastewater treatment plants and privately owned facilities regulated by the PUC, used in the treatment or reclamation of sewage and industrial waste shall possess a certificate of appropriate grade in accordance with Title 23, California Code of Regulations Section 3680. State Boards may accept experience in lieu of qualification training. In lieu of a properly certified wastewater treatment plant operator, the State Board may approve use of a water treatment plant operator of appropriate grade certified by the State Department of Health Services where reclamation is involved.

Each plan shall be operated and maintained in accordance with the operation and maintenance manual prepared by the municipality through the Clean Water Grant Program [CWC Title 23, Section 2233(d)]

ADDITIONAL PROVISIONS APPLICABLE TO  
PUBLICLY OWNED TREATMENT WORKS' ADEQUATE CAPACITY

21. Whenever a publicly owned wastewater treatment plant will reach capacity within four years the discharger shall notify the Regional Board. A copy of such notification shall be sent to appropriate local elected officials, local permitting agencies and the press. The discharger must demonstrate that adequate steps are being taken to address the capacity problem. The discharger shall submit a technical report to the Regional Board showing flow volumes will be prevented from exceeding capacity, or how capacity will be increased; within 120 days after providing notification to the Regional Board, or within 120 days after receipt of notification from the Regional Board, of a finding that the treatment plant will reach capacity within four years. The time for filing the required technical report may be extended by the Regional Board. An extension of 30 days may be granted by the Executive Officer, and longer extensions may be granted by the Regional Board itself. [CCR Title 23, Section 2232]

II. ORGANIC SUBSTRATE INJECTION MONITORING REQUIREMENTS

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

1. Location Map showing the injection point for the organic substrate, and
2. Written summary defining:
  - Depth of injection point;
  - Volume and quantity of organic substrate injected.

III. GROUNDWATER MONITORING PROGRAM

A groundwater-monitoring program shall be designed to detect and evaluate impacts associated with the organic substrate injection activities. The following shall constitute the monitoring program for Monitoring Wells Nos. PMW-7A, PMW-7B, PRB-8A, PRB-8B and PRB-8C (Figures 1-2 and 5-1). 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. The Discharger shall conduct baseline sampling one or two weeks prior to organic substrate injection and regular sampling with the required frequencies of the monitoring wells for the following constituents:

<u>CONSTITUENT</u>	<u>UNITS</u> <sup>1</sup>	<u>TYPE OF SAMPLE</u>	<u>MINIMUM FREQUENCY OF ANALYSIS</u>
Temperature <sup>1</sup>	<sup>0</sup> F	grab	Quarterly <sup>2</sup>
pH <sup>1</sup>	pH units	grab	Quarterly <sup>2</sup>
Oxidation-reduction potential <sup>1</sup>	millivolts	grab	Quarterly <sup>2</sup>
Specific conductivity <sup>1</sup>	umhos/cm	grab	Quarterly <sup>2</sup>
Vinyl Chloride	µg/L	grab	Quarterly <sup>2</sup>
Tetrachloroethene (PCE)	µg/L	grab	Quarterly <sup>2</sup>
Trichloroethene (TCE)	µg/L	grab	Quarterly <sup>2</sup>
Cis-1,2-dichloroethene (Cis-1,2-DCE)	µg/L	grab	Quarterly <sup>2</sup>
Trans-1,2-dichloroethene (Trans-1,2-DCE)	µg/L	grab	Quarterly <sup>2</sup>
1,1-dichloroethene (1,1-DCE)	µg/L	grab	Quarterly <sup>2</sup>
1,2-dichloroethane (1,2-DCA)	µg/L	grab	Quarterly <sup>2</sup>

1,1,1-trichloroethane (1,1,1-TCA)	µg/L	grab	Quarterly <sup>2</sup>
Carbon tetrachloride	µg/L	grab	Quarterly <sup>2</sup>
1,2,4-trimethylbenzene	µg/L	grab	Quarterly <sup>2</sup>
1,1,2-trichloroethane	µg/L	grab	Quarterly <sup>2</sup>
Dissolved organic carbon	µg/L	grab	Quarterly <sup>2</sup>
Manganese	µg/L	grab	Quarterly <sup>2</sup>
Total iron	µg/L	grab	Quarterly <sup>2</sup>
Ferrous iron	µg/L	grab	Quarterly <sup>2</sup>
Alkalinity	µg/L	grab	Quarterly <sup>2</sup>
Total dissolved solids	mg/L	grab	Quarterly <sup>2</sup>
Sulfate	mg/l	grab	Quarterly <sup>2</sup>
Chloride	mg/L	grab	Quarterly <sup>2</sup>
Nitrate	mg/L	grab	Quarterly <sup>2</sup>
Carbon dioxide	mg/L	grab	Quarterly <sup>2</sup>
1,4-dioxane	µg/L	grab	One-time <sup>3</sup>
1,2,3-Trichloropropane	µg/L	grab	One-time <sup>3</sup>
Hexavalent Chromium	µg/L	grab	One-time <sup>3</sup>

Note: mg/L: milligrams per liter; µg/L: micrograms per liter; µmhos/cm: micromhos per centimeter; °F: degree Fahrenheit.

<sup>1</sup> Field instrument will be used to test for this constituent.

<sup>2</sup> Quarterly sampling events are required after the six months sampling event for monitoring wells MW-5, MW-8, MW-9, and MW-10.

<sup>3</sup> One time sampling event before the injection of treated groundwater is required for **all wells on and off site**. If detected, quarterly monitoring is required from the same monitoring wells.

All groundwater monitoring reports must include, at 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 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)

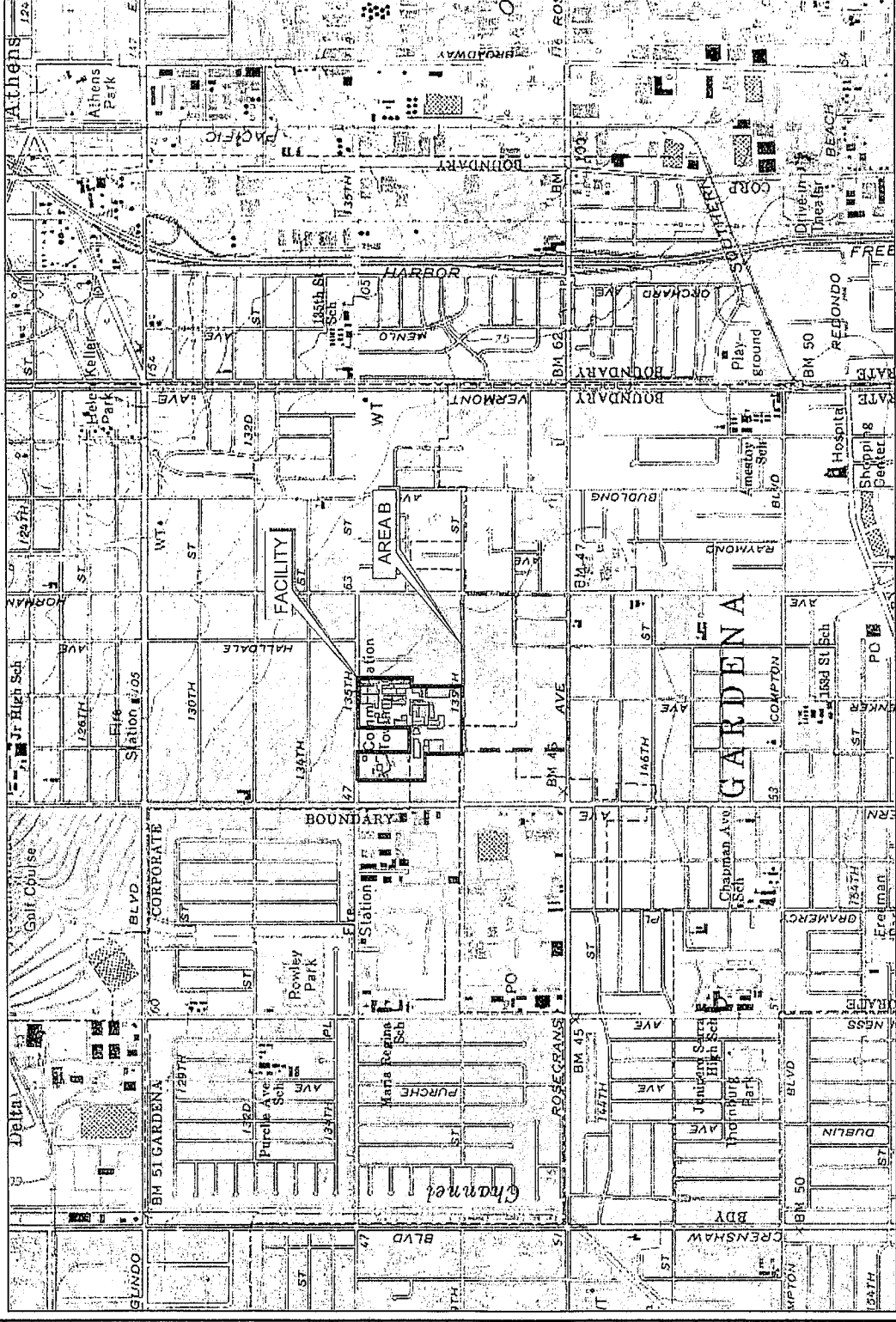
\_\_\_\_\_ (Title)"

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:

  
Tracy J. Egošcuc  
Executive Officer

Date: March 5, 2008



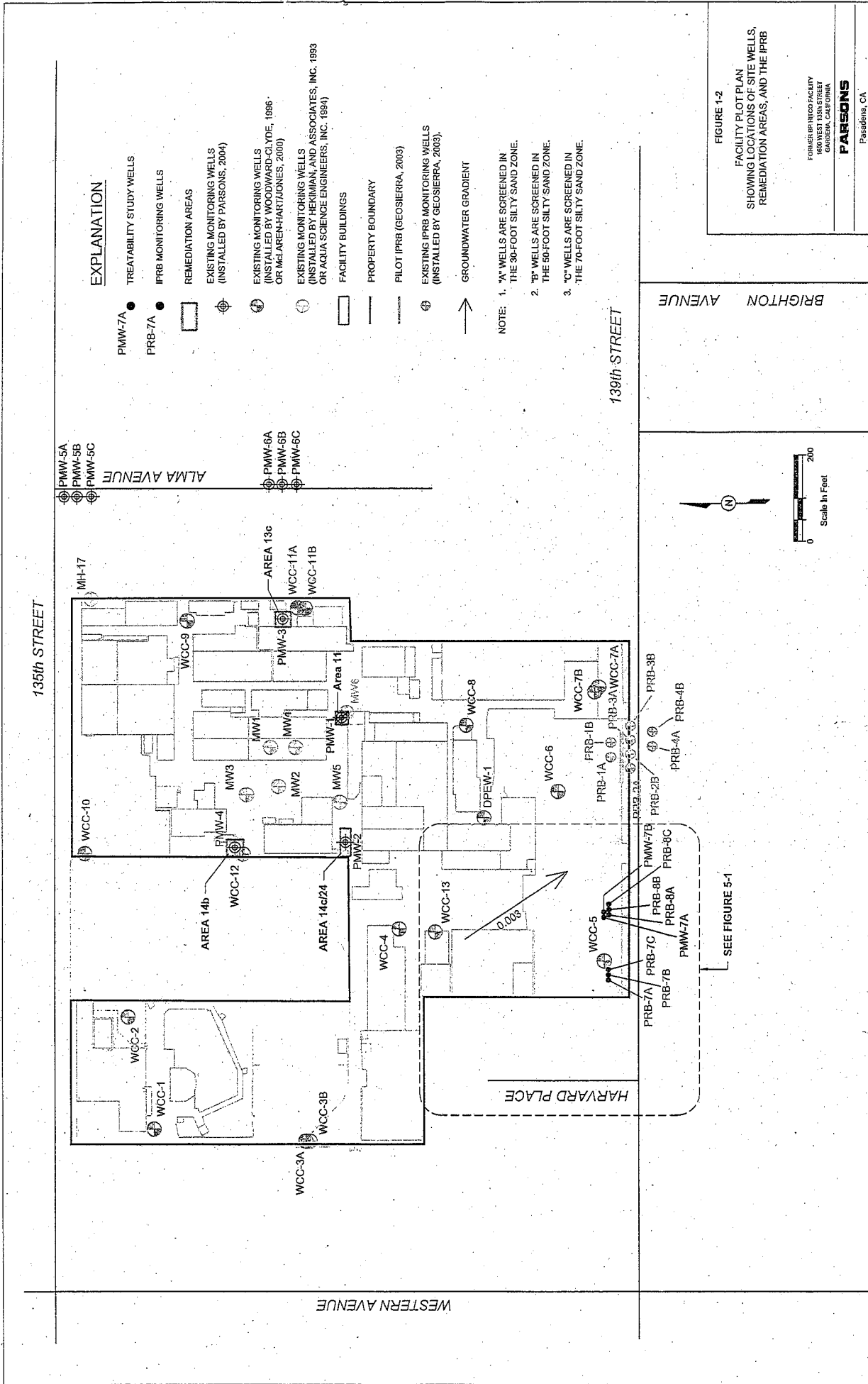
EXPLANATION	
	HITCO FACILITY BUILDINGS
	PROPERTY BOUNDARY
	OUTLINE OF AREA B



**Figure 1-1**  
**Facility Location Map**  
**1600 West 135th Street**

**PARSONS**  
 Pasadena, California





**EXPLANATION**

- PMW-7A ● TREATABILITY STUDY WELLS
- PRB-7A ● IPRB MONITORING WELLS
- REMEDIATION AREAS
- EXISTING MONITORING WELLS (INSTALLED BY PARSONS, 2004)
- EXISTING MONITORING WELLS (INSTALLED BY WOODWARD-CLYDE, 1986 OR McLAREN-HARTJONES, 2000)
- EXISTING MONITORING WELLS (INSTALLED BY HEKIMIAN, AND ASSOCIATES, INC. 1983 OR AQUA SCIENCE ENGINEERS, INC. 1994)
- FACILITY BUILDINGS
- PROPERTY BOUNDARY
- PILOT IPRB (GEOSIERRA, 2003)
- EXISTING IPRB MONITORING WELLS (INSTALLED BY GEOSIERRA, 2003)
- GROUNDWATER GRADIENT

NOTE: 1. "A" WELLS ARE SCREENED IN THE 30-FOOT SILTY SAND ZONE.  
 2. "B" WELLS ARE SCREENED IN THE 50-FOOT SILTY SAND ZONE.  
 3. "C" WELLS ARE SCREENED IN THE 70-FOOT SILTY SAND ZONE.

**FIGURE 1-2**  
 FACILITY PLOT PLAN  
 SHOWING LOCATIONS OF SITE WELLS,  
 REMEDIATION AREAS, AND THE IPRB

FORMER HP INCO FACILITY  
 1600 WEST 150th STREET  
 GARDENA, CALIFORNIA

**PARSONS**

Paradise, CA

BRIGHTON AVENUE

139th STREET

135th STREET

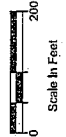
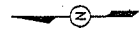
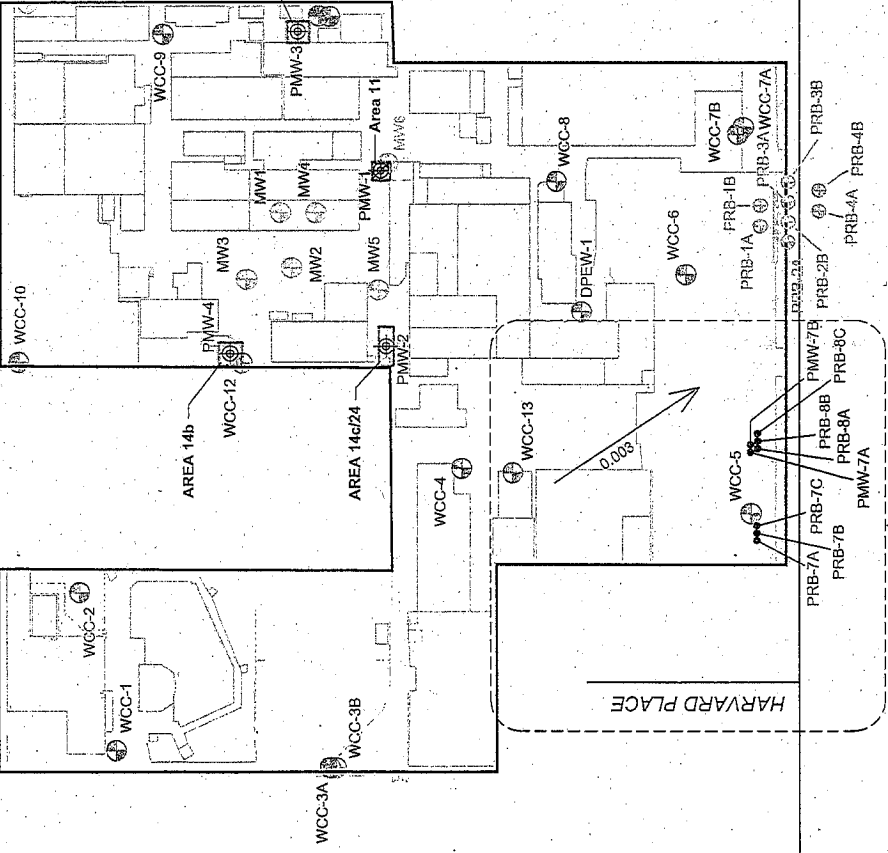
PMW-5A  
 PMW-5B  
 PMW-5C

ALMA AVENUE

PMW-6A  
 PMW-6B  
 PMW-6C

AREA 13c  
 WCC-11A  
 WCC-11B

MH-17



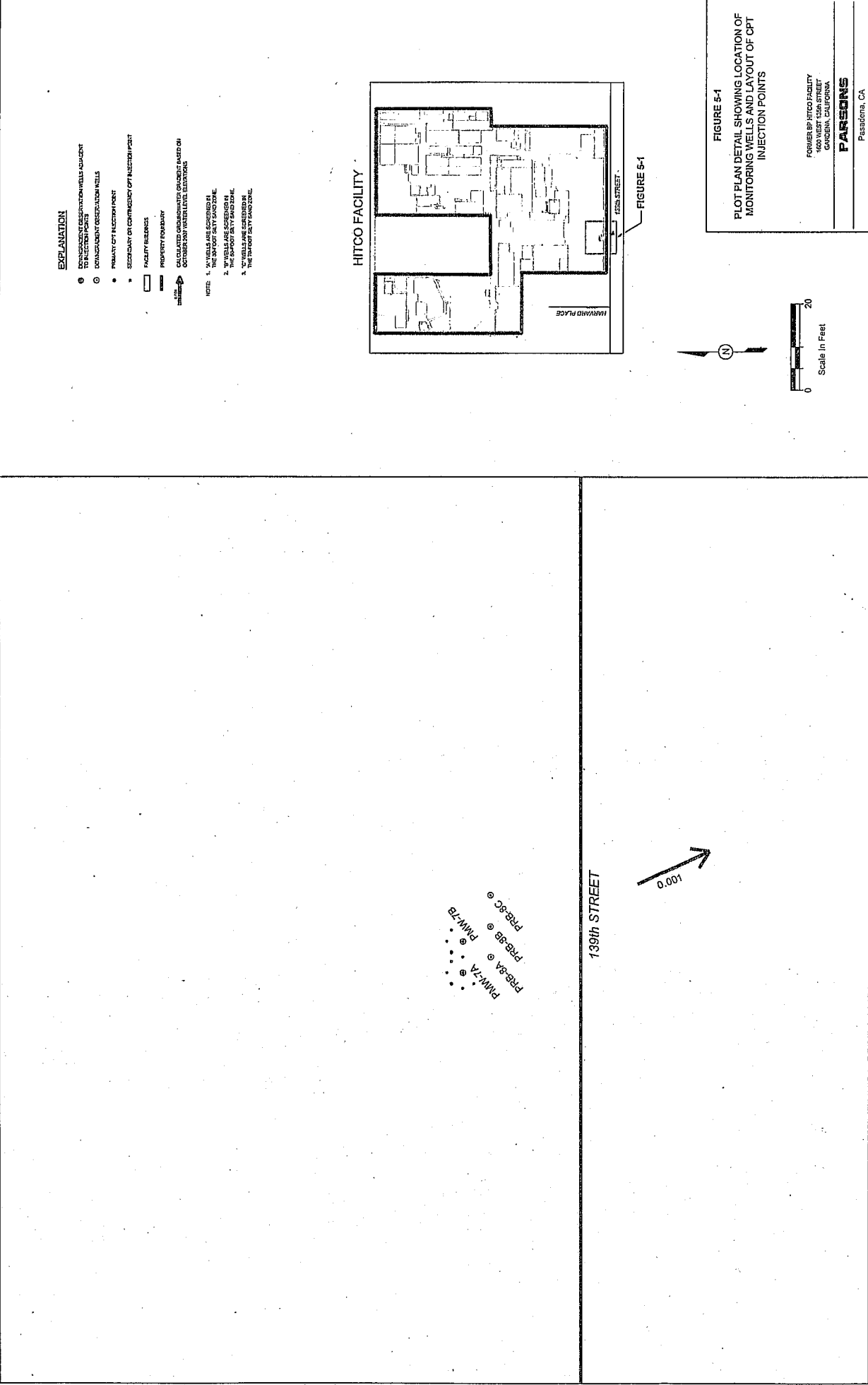
SEE FIGURE 5-1

WESTERN AVENUE

HARVARD PLACE

0.003

WCC-5  
 PRB-7A PRB-7C PRB-7B  
 PRB-8A PRB-8B PRB-8C  
 PMW-7A  
 WCC-7B  
 WCC-7A  
 PRB-3A WCC-7A  
 PRB-1A PRB-1B  
 WCC-6  
 WCC-8  
 DPEW-1  
 WCC-4  
 WCC-3B  
 WCC-3A  
 WCC-2  
 WCC-1  
 AREA 14b  
 WCC-12  
 PMW-4  
 MW-3  
 MW-2  
 MW-5  
 PMW-2  
 PMW-1  
 AREA 14c/24  
 AREA 11  
 MH-17  
 WCC-9  
 PMW-3  
 AREA 13c  
 WCC-11A  
 WCC-11B  
 PRB-3B  
 PRB-4A PRB-4B  
 PRB-2B  
 PMW-7B  
 PRB-7A PRB-7C PRB-7B  
 PRB-8A PRB-8B PRB-8C  
 PMW-7A



**EXPLANATION**

- OBSERVATION WELLS ADJACENT TO INJECTION POINTS
- OBSERVATION WELLS
- PERIMETER OF INJECTION POINT
- PERIMETER OF INJECTION POINT
- ▭ FACILITY BOUNDARY
- ▭ PROPERTY PERIMETER
- ➔ CALCULATED GROUNDWATER GRADIENT BASED ON OBSERVATION WELLS LEVEL ELEVATIONS

NOTE: 1. WELLS ARE SCREENED IN THE SANDY SANDSTONE.  
 2. WELLS ARE SCREENED IN THE SANDY SILTSTONE.  
 3. WELLS ARE SCREENED IN THE SANDY SILTSTONE.  
 4. WELLS ARE SCREENED IN THE SANDY SILTSTONE.

HITCO FACILITY

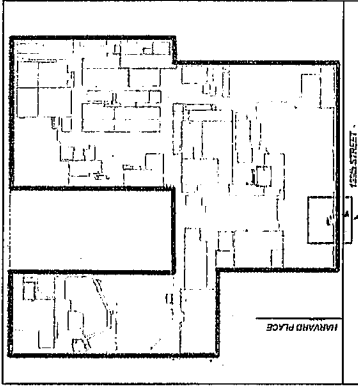


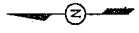
FIGURE 5-1

**FIGURE 5-1**  
 PLOT PLAN DETAIL SHOWING LOCATION OF MONITORING WELLS AND LAYOUT OF CPT INJECTION POINTS

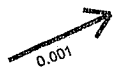
FORMER BP HITCO FACILITY  
 1600 WEST 139th STREET  
 GARDEN, CALIFORNIA

**PARSONS**

Pasadena, CA



139th STREET



PMM-7A  
 PMM-7B  
 PMM-7C  
 PMM-7D  
 PMM-7E  
 PMM-7F  
 PMM-7G  
 PMM-7H  
 PMM-7I  
 PMM-7J  
 PMM-7K  
 PMM-7L  
 PMM-7M  
 PMM-7N  
 PMM-7O  
 PMM-7P  
 PMM-7Q  
 PMM-7R  
 PMM-7S  
 PMM-7T  
 PMM-7U  
 PMM-7V  
 PMM-7W  
 PMM-7X  
 PMM-7Y  
 PMM-7Z