



California Regional Water Quality Control Board

Los Angeles Region



Linda S. Adams
Agency Secretary

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

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Arnold Schwarzenegger
Governor

April 20, 2009

Mr. Andrew Gray
2701 Harbor Blvd., E-2, PMB-224
Costa Mesa, CA 92626

General Waste Discharge Requirements for Groundwater Cleanup at Petroleum Hydrocarbon Fuel, Volatile Organic Compound and/or Hexavalent Chromium Impacted Sites (Order No. R4-2007-0019)

Mobil Service Station 18MAP, 20802 South Vermont Avenue, Torrance, California (Series No. 090; CI No. 9500 (UST File No. R-05290))

Dear Mr. Grey:

We have completed our review of your application for coverage under the General Waste Discharge Requirements to inject modified Fenton's Reagent (Cool-Ox™) at the subject site (the Site). Cool-Ox™ utilizes hydrogen peroxide to break down petroleum hydrocarbon constituents present in subsurface soil at the site. The Cool-Ox™ process generates hydrogen peroxide from solid peroxygens that are injected into the soil in an aqueous suspension. Once in place, the peroxygens react with water to produce hydrogen peroxide.

The Site is located on the southeast corner of the intersection of Torrance Boulevard and Vermont Avenue in the City of Torrance. The Site is currently an active gasoline service station.

Five underground storage tanks (USTs) were removed in March 2009. These USTs will be replaced in the same excavation pit. Between 1998 and 2006, 16.35 gallons of free product have been removed from the site. Between 2007 and 2008, soil vapor extraction (SVE) removed approximately 41.9 pounds of volatile organic compounds from the site.

There are currently nine groundwater monitoring wells at the Site. Groundwater monitoring has been conducted at the Site since November 1998. The most recent monitoring event in January 2009 showed concentrations of TPH-g, benzene, and MTBE in groundwater of 26,000; 5,500; and 1,000 µg/L, respectively.

The Site is located within the West Coast Basin. During the monitoring event in January 2009, groundwater was measured at approximately 35 feet bgs, and the groundwater flow direction was to the northeast.

Between 2007 and 2008 and during an SVE pilot testing activities at the site, low flow rates were achieved at relatively high wellhead vacuums, and an adequate zone of influence could not be achieved using the current vapor extraction well network. Based on information obtained from SVE pilot testing, soil remediation using SVE as the remedial method was found not to be a very effective method to address constituents in the subsurface beneath the site.

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Based on the pilot testing results, Discharger proposed to over-excavate the hydrocarbon-affected soil at the bottom of the tank cavity following UST removal and inject in-situ chemical oxidation at the site.

On March 25, 2009, Discharger submitted a remedial action plan (RAP) and proposed to utilize injection of modified Fenton's Reagent (Cool-Ox™) which utilizes hydrogen peroxide to break down petroleum hydrocarbon constituents present in subsurface soil at the site. The Cool-Ox™ process generates hydrogen peroxide from solid peroxygens that are injected into the soil in an aqueous suspension. Once in place, the peroxygens react with water to produce hydrogen peroxide. Cool-Ox™ will be applied into subsurface soil south and east of UST tank cavity. Approximately 22 injection points will be advanced onsite using direct-push drilling methods. Injection points will be laterally spaced apart in an approximate 8-foot radius from other injection points. Approximately 1,140 cubic yards of subsurface soil will be exposed to Cool-Ox™ during the injection process.

Baseline sampling of wells MW-1 through MW-5 and MW-8 will be performed prior to injection. Remediation progress will be determined through subsequent sampling to be performed approximately 1 week after the last injection event.

On April 14, 2009, this Regional Board approved the RAP with the condition that Cool-Ox™ must be injected through injection probes and no groundwater monitoring wells must be used for this purpose.

Staff has determined that the discharge meets the conditions specified in Order No. R4-2007-0019, "Revised General Waste Discharge Requirements for Groundwater Remediation At Petroleum Hydrocarbon Fuel, Volatile Organic Compound and/or Hexavalent Chromium Impacted Sites (General WDRs)," adopted by the State Water Resources Control Board on March 1, 2007.

Enclosed are your Waste Discharge Requirements, consisting of Regional Board Order No. R4-2007-0019 and Monitoring and Reporting Program No. CI-9500 and Standard Provisions. The WDRs issued shall not be rescinded until Regional Board staff determines the WDRs are no longer needed for the site cleanup.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of this enrollment (April 10, 2009) 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, please reference Compliance File No. CI-9500 to assure that the reports are directed to the appropriate 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. R4-2007-0019 only to the applicant. A copy of the Order will be furnished to anyone who requests it.

Mr. Andrew Gray
Mobil 18MAP

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April 20, 2009

If you have any questions, please contact Ms. Rebecca Chou at (213) 620-6156. Questions regarding the underground storage tank issues should be forwarded to Arman Toumari at (213) 576-6708.

Sincerely,


Tracy J. Egoscue
Executive Officer

Enclosures: 1. Board Order No. R4-2007-0017
2. Monitoring and Reporting Program No. CI-9500

cc: Hari Patel, SWRCB, Underground Storage Tank Cleanup Fund
Nancy Matsumoto, Water Replenishment District of Southern California
Ken Lew, Torrance Fire Department
Karen Gale, Kleinfelder

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STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
MONITORING AND REPORTING PROGRAM NO. CI-9500
FOR
MOBIL STATION 18MAP
ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. R4-2007-0019
SERIES NO. 090

I. REPORTING REQUIREMENTS

- A. ExxonMobil (hereinafter Discharger) shall implement this monitoring program on the effective date of this enrollment (April 8, 2009) under Regional Board Order No. R4-2007-0019. The first monitoring report under this Program is due by **July 15, 2009**.

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, 2010, 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. In addition to the aforementioned requirements, the Discharger shall comply with requirements contained in Section G of Order No. R4-2007-0019 "*Monitoring and Reporting Requirements*".

II. INJECTION MONITORING REQUIREMENTS

Injection of modified Fenton's Reagent (Cool-Ox™):

The quarterly reports shall contain the following information regarding the injection activities. If there is no injection during any reporting period, the report shall so state:

1. Location Map showing injection points.
2. Written summary defining:
 - Depth of injection points;
 - Quantity of Cool-Ox™ injected at each injection point; and
 - Total amount of Cool-Ox™ injected at site.
3. Monthly visual inspection at each injection well shall be conducted to evaluate the well casing integrity for a period of three months after each injection. The quarterly report shall include a summary of the visual inspection.
4. To avoid groundwater monitoring network reduction, data bias, and well screen clogging or alteration, no groundwater monitoring wells shall be used as injection points for ozone during the pilot or full scale remediation.

III. GROUNDWATER MONITORING PROGRAM

A groundwater-monitoring program shall be designed to detect and evaluate impacts associated with the injection activities. The following shall constitute the monitoring program for up-gradient wells MW-1 and MW-2; down-gradient wells MW-4 and MW-5; and source well MW-3 (see figure 2). A baseline monitoring and sampling will be conducted prior to the proposed Cool-Ox™ injections from the existing monitoring wells. Baseline monitoring will establish the initial conditions with respect to the contaminant levels. 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 from existing wells one or two weeks prior to Cool-Ox™ injection and regular sampling with the required frequencies from the up-gradient, down-gradient, and source monitoring wells for the following constituents:

<u>CONSTITUENT</u>	<u>UNITS</u> ¹	<u>TYPE OF SAMPLE</u>	<u>MINIMUM FREQUENCY OF ANALYSIS</u>
pH ²	PH units	Grab	Quarterly
Temperature ²	⁰ F	grab	Quarterly
Oxidation-reduction potential ²	Milivolts	grab	Quarterly
Specific conductivity ²	µmhos/cm	grab	Quarterly
Ferrous iron	µg/L	grab	Quarterly
Dissolved Oxygen ²	µg/L	grab	Quarterly
MTBE	µg/L	grab	Quarterly
Tert-Butyl Alcohol (TBA)	µg/L	grab	Quarterly
Di-isopropyl Ether (DIPE)	µg/L	grab	Quarterly
Ethyl-t-Butyl Ether (ETBE)	µg/L	grab	Quarterly
Tert-Amyl-Methyl Ether (TAME)	µg/L	grab	Quarterly
Acetone	µg/L	grab	Quarterly
Formaldehyde	µg/L	grab	Quarterly
Total Petroleum Hydrocarbons as gasoline (TPHg)	µg/L	grab	Quarterly
Carbon tetrachloride	µg/L	grab	Quarterly
Benzene	µg/L	grab	Quarterly
Ethylbenzene	µg/L	grab	Quarterly
Toluene	µg/L	grab	Quarterly
Total xylenes	µg/L	grab	Quarterly
Methane	µg/L	grab	Quarterly
Total organic carbon	µg/L	grab	Quarterly
Total dissolved solids	mg/L	grab	Quarterly
Sulfate	mg/l	grab	Quarterly
Chloride	mg/L	grab	Quarterly
Boron	mg/L	grab	Quarterly
Carbon dioxide	mg/L	grab	Quarterly

Manganese	µg/L	grab	Quarterly
Total iron	µg/L	grab	Quarterly
Alkalinity	µg/L	grab	Quarterly
Chromium (VI)	mg/L	grab	Quarterly ³
Total Chromium	mg/L	grab	Quarterly ³

¹ mg/L: milligrams per liter; µg/L: micrograms per liter; µmhos/cm: microohms per centimeter; °F: degree Fahrenheit.

² Field instrument will be used to test for this constituent.

³ The Discharger is required to monitor for total chromium and chromium six in the baseline, second and fourth quarterly sampling. If detected at any of these sampling events, the total chromium and chromium six must be monitored quarterly thereafter.

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 _____.

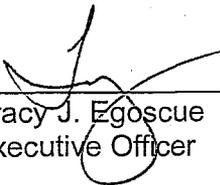
(Signature)

(Title)"

VI. PUBLIC DOCUMENTS

These records and reports are public documents and shall be made available for inspection during normal business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region.

Ordered by:



Tracy J. Egoscue
Executive Officer

Date: April 20, 2009