

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

**RESOLUTION NO. R04-025**

**APPROVING THE ENVIRONMENTAL CHECKLIST AND  
ADOPTING A MITIGATED NEGATIVE DECLARATION FOR  
CONOCOPHILLIPS COMPANY  
FORMER 76 STATION NO. 5195  
(OZONE INJECTION FOR GROUNDWATER CLEANUP)  
(FILE NO. I-11042)**

**WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region (hereafter Regional Board) finds that:**

1. The ConocoPhillips Company (hereafter Discharger) owns the former 76 Station No. 5195 (Station) located at 16205 Leffingwell Road, Whittier, California (site). On December 2, 2002, the Discharger filed with the Regional Board a Report of Waste Discharge for a feasibility test injecting gaseous ozone into the shallow aquifer to remediate the contaminated groundwater at the site.
2. The Station was constructed in 1963 and operated as a retail motor vehicle fuel service station until April 2001 when it was closed for business. All structures, underground storage tanks, gasoline pumps and concrete surfaces have been removed. The site is currently vacant and is surrounded by a chain link fence.
3. In June 1997, four Geoprobe soil borings (SP-1 through SP-4) were drilled at the site. Total petroleum hydrocarbons as gasoline (TPH<sub>G</sub>), benzene, and methyl tertiary butyl ether (MTBE) were detected in soil samples at concentrations as high as 12,000 milligrams per kilogram (mg/kg), 39 mg/kg, and 33 mg/kg, respectively. Groundwater samples had dissolved TPH<sub>G</sub>, benzene, and MTBE concentrations as high as 210,000 micrograms per liter (µg/L), 42,000 µg/L, and 100,000 µg/L, respectively.
4. In October 2002, two 12,000-gallon gasoline underground storage tanks, one 550-gallon underground waste-oil tank, three dispenser islands, product lines, a clarifier and hoist were removed from the site. In addition, a total of 762 tons of contaminated soil were removed.
5. Since July 2000, four on-site groundwater monitoring wells (MW-1, MW-2, MW-3, and MW-7) and six off-site groundwater monitoring wells (MW-4, MW-5, MW-6, MW-8, MW-9, and MW-10) were installed. Quarterly groundwater monitoring results obtained from 1999 to 2003 indicated that TPH<sub>G</sub>, benzene, toluene, ethylbenzene, total xylenes (BTEX) and methyl tertiary butyl ether (MTBE) were present in all monitoring wells. According to the Second Quarter 2003 Site Status Report, monitoring well MW-3 contained the highest concentrations of TPH<sub>G</sub> (36,000 µg/L), benzene (8,300 µg/L), and MTBE (14,000 µg/L).

January 20, 2004

6. In May 2002, soil borings (B-1 through B-6) and air sparge wells (AS-1 and AS-2) were drilled onsite. The soil borings were advanced to a depth of 41.5 feet below ground surface (bgs). Borings B-1, B-3, B-4, and B-6 were subsequently converted to vapor extraction wells. Maximum concentrations for TPH<sub>G</sub>, benzene, and MTBE detected in the soil were 2,400 mg/kg, 20 mg/kg, and 22 mg/kg, respectively.
7. On June 5, 2002, a vapor extraction test was performed using wells MW-3 and B-6. Laboratory analytical results of vapor samples indicated the presence of up to 3,500 parts per million in volume (ppmv) of volatile fuel hydrocarbons (VFH). In addition, on June 6 and 7, 2002, individual air sparging tests were performed using wells AS-1 and AS-2 as test wells and MW-1, MW-2, MW-3, B-1, B-4 and B-6 as observation wells. No hydrocarbon vapor trends could be determined for the AS-1 test since sparging was unsuccessful. However, significant amounts of hydrocarbon vapor were detected during the sparging test using AS-2.
8. The test results indicated that air sparging alone appears to be ineffective in remediating the groundwater based on the common criteria used to evaluate its success (e.g., groundwater mounding and hydrocarbon vapor increases).
9. On August 5, 2002, the Discharger submitted a Feasibility Testing Report proposing to conduct a one-month feasibility test using C-Sparge™ to remediate the dissolved-phase petroleum hydrocarbon plume beneath the site. The proposed test was approved by Regional Board staff on January 29, 2003.
10. A total of ten sparge points (CP-1 through CP-10), integral to the C-Sparge™ system, will be installed onsite within and around the dissolved-phase plume. The perforated sparge point is approximately 3 feet in length and the section will be placed at a depth of 37 to 40 feet bgs.
11. The C-Sparge™ system operations will use only microbubbles [10 to 50 micrometers (µm) in diameter] of encapsulated ozone discharged below the water table. During sparging, no groundwater or vapors will be extracted. No other known constituents will be discharged to the subsurface during system operations. Sparging will be performed on a cycled basis with each well cycled on for 5 to 10 minutes. Per manufacturer specifications, the C-Sparge™ system will inject approximately five grams per hour of ozone at a flow rate of 3 to 5 cubic feet per minute (cfm). The concentration of ozone injected into the subsurface during system operations will be approximately 0.59 milligrams per liter (mg/L).
12. The Discharger states that ozone will lose its stability within a few hours to a few days and therefore will not migrate significantly downgradient. In addition, ozone will chemically react with hydrocarbons in the immediate vicinity of each injection point to form intermediate by-products of various smaller chain hydrocarbons and oxygenates. The following table shows the laboratory-isolated breakdown by-products that could be produced during the ozone oxidation process with the hydrocarbons:

Constituent	Breakdown Products
TPH	acetate, butyrate, formate, propionate
BTEX	Carboxylic acids
MTBE	TBA (tertiary butyl alcohol), TBF (tertiary butyl formate), formate, oxygen, hydrogen peroxide
ETBE	TBA, TBF, acetate, oxygen, hydrogen peroxide
TBA	Formaldehyde, acetate, carbon dioxide, water

Finally, the residual oxygen from the reaction encourages bioremediation which consumes the listed by-products and converts them to carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O).

13. Prior to initiating the C-Sparge™ technology, groundwater samples will be collected from monitoring wells MW-1 through MW-10 for baseline measurements of depth to groundwater, TPH<sub>G</sub>, benzene, toluene, ethylbenzene, xylenes, MTBE, tertiary butyl alcohol (TBA), tertiary amyl methyl ether (TAME), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), ethanol, dissolved oxygen, and dissolved ferrous iron. These measurements/samples will also be collected bi-weekly during the first month of system operation. Data collected during the first month of system operation will be used to evaluate the C-Sparge™ effectiveness at this site.
  
14. On June 13, 1994, the Regional Board adopted a revised *Water Quality Control Plan for Coastal Watersheds of Los Angeles and Ventura Counties* (Basin Plan) which was amended on January 27, 1997 by Regional Board Resolution No. 97-02. The Basin Plan (i) designates beneficial uses for surface waters and groundwater, (ii) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State anti-degradation policy (*Statement of Policy with Respect to Maintaining High Quality Waters in California*, State Water Resources Control Board (State Board) Resolution No. 68-16, October 28, 1968), and (iii) describes implementation programs to protect all waters in the Region. In addition, the Basin Plan incorporates by reference applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. The Regional Board prepared the 1994 update of the Basin Plan to be consistent with previously adopted State and Regional Board plans and policies. This Order implements the plans, policies and provisions of the Regional Board's Basin Plan.
  
15. The Basin Plan designated beneficial uses and water quality objectives for groundwater within the Central Groundwater Basin which underlies the Station as follows:  
  
 Existing: municipal and domestic supply; industrial service supply; industrial process supply; and agricultural supply.
  
16. The permitted discharge is consistent with the anti-degradation provisions of State Water Resources Control Board Resolution No. 68-16 (Anti-degradation Policy). The discharge may result in some localized temporary exceedance of background

concentrations of dissolved oxygen, dissolved ferrous iron, total dissolved solids, sulfate, chloride, and boron. However, any parameter change resulting from the discharge:

- a. will be consistent with maximum benefit to the people of the State,
  - b. will not unreasonably affect present and anticipated beneficial uses of such waters, and
  - c. will not result in water quality less than that prescribed in the Water Quality Control Plan for the Central Groundwater Basin.
17. The Regional Board has assumed lead-agency role for this project under the California Environmental Quality Act (Public Resources Code section 21000 et seq.) and has conducted an Initial Study in accordance with section 15063 of the "State CEQA Guidelines" at California Code of Regulations, title 14, section 15000 et seq. Based upon the Initial Study, Regional Board staff prepared a Mitigated Negative Declaration that the project, as mitigated, will not have a significant adverse effect on the environment. The Regional Board is adopting the Mitigated Negative Declaration concurrently with its adoption of this Order.
  18. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for this discharge and has provided them with an opportunity to submit their written views and recommendations. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge and to the tentative requirements.
  19. Copies of the Initial Study, the Mitigated Negative Declaration and Tentative Waste Discharge Requirements were transmitted to all agencies and persons known to be interested in the matter.
  20. All comments received have been addressed by Regional Board staff. The Regional Board considered all testimony and evidence at a public hearing held on January 29, 2004, at the Metropolitan Water District of Southern California (Board Room), 700 North Alameda Street, Los Angeles, California, and good cause was found to approve the Environmental Checklist and adopt a Mitigated Negative Declaration.

**THEREFORE BE IT RESOLVED THAT:**

1. This Regional Board hereby approves the Environmental Checklist and adopts the Mitigated Negative Declaration for the ConocoPhillips Company, 76 Station No. 5195, Whittier, project known as Injection of Gaseous Ozone for the Remediation of Groundwater.
2. A copy of this Resolution shall be forwarded to the State Water Resources Control Board.
3. A copy of this Resolution shall be forwarded to all interested parties.

4. The discharge of ozone into the shallow aquifer shall conform with all the requirements, conditions, and provisions set forth in A. *"Discharge Specifications,"* B. *"Discharge Prohibitions,"* and C. *"Provisions"* of ORDER NO. R4-2004-0049.

#### **CERTIFICATION**

I, Dennis A. Dickerson, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region on March 4, 2004.

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DENNIS A. DICKERSON  
Executive Officer

March 4, 2004  
Date