

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LOS ANGELES REGION

ORDER NO. R4-2006-0072

WASTE DISCHARGE REQUIREMENTS  
FOR  
CAL-STYLE FURNITURE MANUFACTURING COMPANY  
IN-SITU BIOREMEDIATION OF  
VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER  
FORMER REYES CLARIFIER VICINITY

(FILE NO. 98-086)

The California Regional Water Quality Control Board, Los Angeles Region, (hereafter Regional Board) herein finds that:

**PURPOSE OF ORDER**

1. The CAL-STYLE FURNITURE MANUFACTURING COMPANY (hereafter Discharger or Cal-Style) has filed a Report of Waste Discharge and applied for Waste Discharge Requirements to use a non-pathogenic (naturally derived, not genetically engineered) chlorinated-ethene degrading microbial consortium containing Dehalococcoides ethenogenes culture, referred to as KB-1, to bioremediate chlorinated volatile organic compounds (VOCs) in shallow groundwater through reductive dechlorination to environmentally acceptable, non-toxic ethene in groundwater at the Former Reyes Clarifier Vicinity Site (Site) identified below.

**FACILITY DESCRIPTION**

2. The Cal-Style facility formerly included a site of approximately 14 acres consisting of manufacturing buildings and facilities. The Site is located at 18744 South Reyes Avenue, Compton, California (Latitude 33° 51'00" North, Longitude 118° 13'00" West). The former Reyes clarifier was located along the western portion of the Site, and installed outdoors below the concrete slab adjacent to one of the manufacturing buildings. During Cal-Style's operation of the facility from 1979 to 1994, the Site consisted of manufacturing buildings and facilities formerly associated with the production of metal and wood furniture. According to the record, the Cal-Style did not operate the former Reyes clarifier during its occupation of the facility, but Los Angeles County records indicate that the clarifier was operated by others prior to 1979. Dominguez Industrial Center, LLC (DIC) owns the Site and Masco Corporation/Cal-Style Manufacturing is performing the groundwater remediation work. The Site is currently used for commercial warehousing operations.

**SITE HYDROGEOLOGY**

3. Shallow groundwater beneath the Site is first encountered at depths ranging from approximately 40 to 45 feet below ground surface (bgs). Shallow groundwater is unconfined and occurs within the Bellflower Aquitard. The Exposition and Gage Aquifers are present beneath the Bellflower Aquitard. The Bellflower Aquitard comprises the upper portion of the Lakewood Formation and generally occurs from land surface to depths of approximately 105 to 130 feet beneath the Site and appears to be laterally continuous across the Site. The Bellflower Aquitard is comprised primarily of a heterogeneous mixture of low permeability silts and clays, with lenses and layers of sandy or gravelly clay, silty sand, and sand identified in some areas. The Bellflower Aquitard is known to

have relatively low hydraulic conductivities and regional groundwater supply wells are not screened in and do not produce from this unit.

4. There are eight water supply wells located within an approximate 1-mile radius of the Site (figure attached). One of the wells is identified as City of Compton well (state ID 13W-26M01S), two are Southern California Edison wells, and five are California Water Service Company (Dominguez) wells. Available information indicates that the depths to the tops of the screened intervals for these wells range from approximately 256 to 606 feet and are located in the deep aquifer system. The water supply well closest to the site is California Water Service Company well, State ID 13W-35Q05S, with the top of the screened interval at a depth of 430 feet. The other two closest wells, California Water Service Company wells state ID 13W-35P01S and state ID 13W-35Q06S have not been pumped since 2000 and 2002, respectively.

#### **SITE INVESTIGATION & REMEDIATION STATUS**

5. In 1997, environmental consultants, on behalf of the Discharger, began soil, soil gas, and groundwater investigations at the Site and discovered VOCs impact in the subsurface soil and groundwater near the former Reyes Clarifier. The Discharger submitted soil, soil gas, and groundwater investigation reports to the Los Angeles County Department of Public Works and the Regional Board.
6. The Discharger has conducted a comprehensive site-wide soil and groundwater investigation consisting of drilling more than 11 soil borings, collecting and analyzing over 56 soil samples, collecting and analyzing 49 soil gas samples, installation of 16 groundwater monitoring wells, 46 hydropunch groundwater sampling points, and collection and analysis of approximately 250 groundwater samples.
7. The Site-wide investigations show that the predominant contaminant detected in soil and groundwater is trichloroethene (TCE) with trace levels of 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethene (1,2-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), and trans-1,2-dichloroethene (trans-1,2-DCE). Concentrations of VOCs range from non-detect up to 1,700 micrograms per liter ( $\mu\text{g/l}$ ) TCE, up to 16  $\mu\text{g/l}$  1,1-DCE, up to 4.4  $\mu\text{g/l}$  1,1-DCA, near or below detection levels of 1,2-DCE, cis-1,2-DCE, cis-1,2-DCE, and trans-1,2-DCE. The groundwater plume extends over an area of approximately 900 feet by 350 feet.
8. The Discharger installed a soil vapor extraction remediation system (VES) at the site to reduce the concentration and mass of VOCs in the VOCs-impacted soil. Full-scale vapor extraction and treatment operations began in July 2003 and continued for more than eight months. The SVE system was shut down on March 22, 2004 after asymptotic conditions were reached. Following shutdown of the SVE treatment system, soil vapor and bulk soil confirmation sampling were performed and the results confirmed that residual TCE concentrations remaining in source area vadose zone soil, above the capillary fringe, have been reduced significantly over pre-remediation levels. A soil closure report including the summary of the confirmation sampling results has been submitted to this Regional Board and staff is currently reviewing the document for a no-further-action determination.

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### **TREATMENT PROCESS DESCRIPTION**

9. The Discharger proposes to remediate VOCs in shallow groundwater (Bellflower Aquitard to Gaspar Aquifer) at the Site using carbon source amendment (sodium lactate) and KB-1. A remediation work plan involving the use of carbon source amendments and KB-1 has been submitted by the Discharger and approved by the Regional Board on May 10, 2005. Groundwater will be treated using enhanced in-situ bioremediation as presented in the Work Plan. An amendment solution will be injected into the three proposed injection wells in the source area where it will promote biological reduction of TCE to ethene as groundwater flows through the amendment area. After the designed amendment supply is completed, the remaining amendment in the groundwater will naturally break down, effectively removing food source and allowing the groundwater system to return to more aerobic conditions.
10. The proposed carbon source is covered for use under Regional Board Order No. R4-2005-0030 "General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel and/or Volatile Organic Compound Impacted Sites" (General WDR). KB-1 requires a carbon source amendment (food), VOCs, and anaerobic conditions to survive. Given these growth requirements, KB-1 will not survive indefinitely after the residual carbon sources have been consumed or the VOCs have been depleted following the last delivery of carbon source amendment. Carbon source amendment (sodium lactate) will be introduced to the injection wells in 0.12 percent concentration (by weight) at 972 gallons per month. A total of 60 liters of KB-1 will be directly injected into the groundwater via three injection wells with 20 liters of KB-1 added to each injection well.
11. The Work Plan presents the procedures for monitoring the remediation program, evaluating the injection volume and concentrations, and the frequency of injection will be adjusted based on the results of field monitoring. Groundwater conditions will be monitored during the operation to evaluate the efficiency of the injection. The monitoring program will be implemented in accordance with the attached monitoring and reporting program (MRP).
12. Should indications of offsite migration occur, the contingency plan is the installation of a hydraulic containment system. The slow rate of groundwater flow within and down gradient of the source area allows for sufficient time to complete design, installation, and implementation of a hydraulic containment system if necessary.
13. Any injection of a solution into the groundwater is a discharge of waste as defined by the California Water Code. However, the discharge of carbohydrate (sodium lactate) solution with chlorinated-ethene degrading consortium KB-1 is intended to provide more effective remediation of chlorinated VOC-impacted groundwater and is expected to significantly reduce the anticipated site cleanup time as compared to pump-and-treat technology or enhanced in-situ bioremediation without addition of KB-1.
14. The application of carbon source amendment and KB-1 to groundwater may result in temporary adverse impacts to groundwater quality, but impacts that may result will be localized, and of short-term duration, and will not impact any existing or prospective uses of groundwater. The addition of a carbohydrate (sodium lactate) solution with KB-1 will improve groundwater conditions by ensuring complete degradation of TCE to ethene.

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### **APPLICABLE LAWS, PLANS, POLICIES AND REGULATIONS**

15. 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.
16. The beneficial uses for the Central Groundwater Basin are municipal and domestic water supply, industrial service and process supply, and agricultural supply.
17. 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 exceedances of background concentrations of total organic carbon, iron, manganese, arsenic, total dissolved solid (TDS), and certain microorganisms. However, after the injection of amendments, these parameters are not anticipated to exceed the primary or secondary standards to the extent that these parameters do not already exceed the respective standard. Moreover, 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 water, and
  - c. Will not result in water quality less than that prescribed in the Water Quality Control Plan for Central Groundwater Basin.
18. This 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, the 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.
19. 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 for a public hearing and an opportunity to submit their written comments and recommendations. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge and to the tentative requirements.

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**IT IS HEREBY ORDERED** that Cal-Style Furniture Manufacturing Company, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted there under, shall comply with the following:

**A. Discharge Limits**

1. The Discharger shall not cause the groundwater outside of the remediation area to exceed background concentrations of chloride and TDS established prior to start of remediation.
2. The discharge of carbohydrate (sodium lactate) solution with chlorinated-ethene degrading consortium, referred to as KB-1, into the groundwater shall be only performed while this Order is in force.
3. During this remediation, the injection volume of sodium lactate shall not exceed 26,280 gallons and the injection volume of KB-1 shall not exceed 60 liters at the Site, unless approved by the Executive Officer.
4. Discharge duration shall not exceed more than two years, unless approved by the Executive Officer for warranted extension and/or expansion of the in-situ bioremediation of VOCs operation.
5. The amendment solution shall be limited to potable water, extracted groundwater, amendments specified in the approved Work Plan.

**B. Discharge Specifications**

1. The Discharger shall stop further addition of amendments to the groundwater if carbon source amendment and *Dehalococcoides* associated with KB-1 are observed to be migrating off-site.
2. The Discharger shall not cause KB-1, the amendment, and the by-products of the bioremediation process to migrate outside of the treatment area established by the Discharger and approved by the Executive Officer.
3. The discharge of carbohydrate (sodium lactate) solution with KB-1 or any by-products into any surface water or surface water drainage course is prohibited.
4. The Discharger shall not cause the groundwater to contain taste or odor producing substances in concentrations that cause nuisance or adversely affect beneficial uses outside the treatment area.
5. The Discharger shall not cause the groundwater to contain concentrations of chemical substances or its by-products, including KB-1 solution in amounts that adversely affect any designated beneficial use as a result of the injection of solution.
6. The Discharger shall implement hydraulic control to prevent off-site migration if determined necessary by the Executive Officer.

**C. Provisions:**

1. This Order includes the attached "Standard Provisions Applicable to Waste Discharge Requirements," which are incorporated herein by reference. If there is any conflict between

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provisions stated herein before and the attached "Standard Provisions," those provisions stated herein shall prevail.

2. Discharge of wastes to any point other than specifically described in this Order is prohibited and constitutes a violation thereof.
3. In the event of any change in name, ownership, or control of the Site, the Discharger shall notify this Regional Board in writing and shall notify any succeeding owner or operator of the existence of this Order by a letter, a copy of which shall be forwarded to this Regional Board.
4. A copy of these requirements shall be maintained at an on-site office and be available at all times to operating personnel.
5. In accordance with section 13260 of the Water Code, the Discharger shall file a report of any material change or proposed change in the character, location or volume of discharge.
6. The Discharger shall notify Regional Board immediately by telephone of any adverse condition resulting from this discharge or from operations producing this waste discharge, such notifications to be affirmed in writing within one week from the date of such occurrence.
7. This Regional Board considers the property operator and owner to have continuing responsibility of correcting any problem that may arise in the future as a result of this discharge.
8. All work must be performed by or under the direction of a registered civil engineer, registered geologist, or certified engineering geologist. A statement is required in all technical reports that the registered professional in direct responsible charge actually supervised or personally conducted all the work associated with the project.
9. The use of a carbohydrate (sodium lactate) solution with KB-1 solution shall not cause a condition of pollution or nuisance as defined by California Water Code, section 13050.
10. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as specified in the attached Monitoring and Reporting Program No. CI-XXXX. Violations of any conditions may result in enforcement action, including Regional Board or Court Order requiring corrective action or imposition of civil monetary liability, or revision, or rescission of the Order.
11. This Order does not exempt the Discharger from compliance with any other laws, regulations, or ordinances, which may be applicable. This Order does not legalize the waste treatment Site, and leaves unaffected any further restraints on the Site that may be contained in other statutes or required by other agencies.
12. The Discharger shall cleanup and abate the effects of injecting amendment solution as specified in the WDR permit, including extraction of any by-products which adversely affect beneficial uses, and shall provide an alternate water supply source for municipal, domestic or other water use wells that become contaminated in exceedance of water quality objectives as a result of using the solution.
13. In accordance with section 13263 of the California Water Code, these requirements are subject to periodic review and revision by this Regional Board.

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14. After notice and opportunity for a hearing, this Order may be terminated or modified for cause including, but not limited to:
  - a. Violation of any term or condition contained in this Order.
  - b. Obtaining this Order by misrepresentation, or failure to disclose all relevant facts.
  - c. A change in any condition that requires either a temporary or permanent reduction or elimination of authorized discharge.
  
15. The Regional Board, through its Executive Officer, will modify the Monitoring and Reporting Program, as necessary. The California Environmental Quality Act (CEQA) initial study and associated public comment were conducted once as part of the Waste Discharge Requirement (WDR) permit application process and will not be required for the expansion or modification of this remediation program.

**D. Expiration Date**

This Order expires on September 14, 2010.

The Discharger must file a Report of Waste Discharge in accordance with title 27, California Code of Regulations, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.

I, Jonathan Bishop, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Los Angeles Region on September 14, 2006.

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Jonathan S. Bishop  
Executive Officer