

California Regional Water Quality Control Board  
North Coast Region

WASTE DISCHARGE REQUIREMENTS  
ORDER NO. R1-2009-0066  
FOR

IN-SITU TREATMENT  
OF CONTAMINATED SOIL AND GROUNDWATER  
REDUCTIVE DE-CHLORINATION

West College Center, LLC  
Former Best Cleaners  
1007B West College Avenue  
Santa Rosa, California

Sonoma County

The California Regional Water Quality Control Board, North Coast Region (hereinafter the Regional Water Board), finds that:

1. West College Center (hereinafter "Discharger") submitted a report of waste discharge (ROWD) on April 7, 2008 and May 21, 2008 proposing to conduct in-situ treatment of chlorinated volatile organic compounds (CVOCs) at 1007 West College Avenue in Santa Rosa, California (hereinafter "Site") (**Figure 1**). An air quality monitoring plan and supplemental analytical information necessary to complete the ROWD were submitted on January 30, 2009 and February 9, 2009, respectively.
2. The Site is a former dry cleaning facility located at the southeast corner of the G&G Market shopping center adjacent to the intersection of West College Avenue and Clover Drive (**Figure 2**). The Site is bordered on the north by commercial businesses, to the west by a G&G Shopping Center parking lot, to the east by Clover Drive and a commercial property, and to the south by West College Avenue and residential properties.
3. A dry cleaning facility operated at the site from 1987 to 2006 with five different operators with business names including Peter Pan Cleaners, Art Cleaners, Full Dress Cleaners and Best Cleaners. Soil and groundwater at the Site are contaminated with the dry cleaning chemical tetrachloroethylene (PCE).
4. Regional Water Board staff conducted a passive soil gas survey in 2001 in the Clover Drive and West College Avenue area. The results revealed a PCE discharge at the Best Cleaners facility location. Subsurface investigative work conducted since that time on behalf of the Discharger revealed the presence of three permeable lenses of sands and gravels identified as zones A through C. The A, B and C zones exist between 7 and 24 feet, 25-40 feet and greater than 40 feet below ground surface, respectively. The predominant groundwater flow direction for the A zone is to the west with a gradient ranging from 0.01 to .003 ft/ft. The groundwater flow direction for the B zone has ranged from northwest to southwest with a gradient range of 0.07 to .003 ft/ft. The A and B water bearing zones have been impacted by PCE.

5. The Discharger completed a feasibility study in January 2007, which evaluated soil and groundwater cleanup strategies. Reductive de-chlorination was the remedy selected for cleanup of the Site. Reductive de-chlorination can be an effective treatment technology capable of reducing chlorinated hydrocarbons to non-toxic end products.
6. Reductive de-chlorination is a microbial mediated chemical reaction where a chlorine atom is replaced by a hydrogen atom. It involves the addition of a reducing agent (food source), which is naturally degraded and fermented in the subsurface, resulting in an increase in microbial populations and the generation of hydrogen atoms, which are available electron donors. The chlorinated hydrocarbon molecules are utilized as terminal electron accepters and the PCE is reductively de-chlorinated to Trichloroethylene (TCE), cis- and trans- 1,2-DCE and vinyl chloride (VC). Vinyl chloride is more toxic than the parent compound. However, its presence is temporary as the de-chlorination process continues to ethene, carbon dioxide, chloride, and water. The PCE degradation process is described on **Figure 3**.
7. The Discharger has selected cheese whey as the reducing agent. Emulsified oils and vitamin B12 may be added to the mixture. Other suitable reducing agents exist, such as molasses, which may also be used are regulated under this Order. Any future injections of reducing agents other than cheese whey, emulsified oils and vitamin B12 shall be conducted in accordance with Discharge Specification B.2 below.
8. The injection system consists of thirteen dual-completion wells for injection into the A and B water bearing zones. The treatment process will include multiple injections over an estimated three-year time period, which are authorized under these Waste Discharge Requirements in accordance with the terms and conditions of this Order. The injection well locations and the proposed treatment area are shown on **Figure 4**. Any future injections at locations other than those shown on Figure 4 shall be conducted in accordance with Discharge Specification B.2 below.
9. During the reductive de-chlorination process, metals, such as arsenic, manganese and antimony, may be mobilized in the subsurface. The mobilization of metals, if at all, is temporary. Background metal concentrations have been established and post treatment monitoring will be conducted to verify the return of pre-treatment conditions.
10. The project could result in the temporary generation of hydrogen sulfide and vinyl chloride gases, although unlikely. Air monitoring will be conducted according to the contingency plan described in the ROWD Air Quality Management Plan (AQMP), which is incorporated into this Order as part of the Monitoring and Reporting Program R1-2009-0067
11. Groundwater quality conditions will be verified with groundwater monitoring, which will be accomplished by sampling ten (10) A-Zone wells and seven (7) B-

Zone wells in accordance with Monitoring and Reporting Program No. R1-2009-0067. The groundwater well locations are also shown on **Figure 4**.

12. The Site is located northwest of the former Sonoma French Cleaners (also formerly known as Santa Rosa French Cleaners, Bev's Westside Cleaners and Westside Cleaners) located at 926 West College Avenue. The PCE discharge from the former 926 West College Avenue cleaner location resulted in significant water quality impacts including impacts to numerous private water supply wells south of West College Avenue in an unincorporated area of Santa Rosa where groundwater was the sole water supply source.
13. Commingling of PCE plumes is likely beneath West College Avenue in the area of the Clover Drive/West College Avenue intersection. Investigative work conducted in and immediately south of West College Avenue revealed the presence TCE and DCE at levels that are consistently present in higher proportions than those that have been detected at the Site. The presence of these breakdown products appears to be related to the 926 West College Avenue site, and distinguishes the two plumes. The Discharger proposes to remediate groundwater related to the Site, and has estimated that the approximate line of demarcation between the two sites to be the center line of West College Avenue. This estimate of the demarcation between the two sites is based on the groundwater chemistry and evidence of an older and separate release from the 926 West College Avenue site.
14. The injection of reducing agents is consistent with the anti-degradation provisions of State Water Resources Control Board (SWRCB) Resolution No. 68-16 and the SWRCB Resolution 92-49; Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304. The in situ soil and groundwater treatment project is designed to accelerate cleanup at the Site and ultimately restore the beneficial uses of groundwater.
15. The Regional Water Board's Water Quality Control Plan for the North Coast Region includes beneficial uses and water quality objectives for groundwater. Beneficial uses of groundwater include: municipal and domestic water supply, industrial water supply, industrial process water supply, and agricultural water supply. The water quality objectives for PCE, TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE and VC for groundwater are presented in Table 1, and incorporated into this Order. In cases where the water quality objective is below the common minimum laboratory detection limit of 0.5 ppb, the laboratory detection limit is controlling.
16. The site is located within the city limits of Santa Rosa. Drinking water is supplied by the City of Santa Rosa municipal water system. Numerous water supply wells exist in the West College Avenue and Clover Drive area that are currently used for irrigation.
17. The Regional Water Board is the lead agency for this project under the California Environmental Quality Act (Pub. Resources Code, section 21000 et seq.) (CEQA). An Initial Study/Checklist and Mitigated Negative Declaration were

prepared in accordance with Title 14, California Code of Regulations, section 15063. On July 23, 2009, the Regional Water Board provided notice of intent to adopt a Mitigated Negative Declaration (SCH No. XXXX) for the project (California Code of Regulations, Title 14, § 15072.) The Mitigated Negative Declaration reflects the Regional Water Board's independent judgment and analysis. After considering the Initial Study/Checklist and other documents and comments received during the public review process, the Regional Water Board hereby determines that the proposed project, with the implementation of the mitigation measures set forth in the Mitigated Negative Declaration, will not have a significant effect on the environment. Implementation of the mitigation measures are incorporated as a condition of this Order. Monitoring and Reporting Program R1-2009-0067 suffice as a monitoring a reporting requirement under section 15097 of the CEQA Guidelines and will provide assurance of compliance with mitigation requirements identified within the mitigated negative declaration. The documents or other material, which constitute the record, are located at the Regional Water Board office located at 5550 Skylane Blvd., Santa Rosa, California. The Regional Water Board will file a Notice of Determination within five days from the issuance of this order.

18. The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit written comments and recommendations.
19. The Regional Water Board, at a public meeting on October 1, 2009, heard and considered all comments pertaining to the discharge.

THEREFORE, IT IS HEREBY ORDERED that the Discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

**A) DISCHARGE PROHIBITIONS**

1. Creation of a pollution, contamination, or nuisance, as defined by Water Code section 13050, subdivision (m), is prohibited. (Health and Safety Code, section 5411.)
2. The discharge of the reducing agent (whey mixture), or an alternate reducing agent, to land, surface water, or to groundwater in areas other than approved for remedial actions, as shown on Figure 4, by this Order is prohibited.
3. The discharge of any waste not specifically regulated by this Order is prohibited.

**B) DISCHARGE SPECIFICATIONS**

1. The injection of the reducing agent shall not impart taste, odor, or color to, or otherwise degrade the beneficial use of areal groundwater, except for temporary taste and odor changes within the proposed treatment area.

2. The methods for injection and reinjection of reducing agents shall be conducted as described in the complete ROWD dated April 7, 2008, May 21, 2008, January 30, 2009 and February 9, 2009. Alternate injection points and/or reducing agents, such as molasses, are not considered significant changes in the discharge, and may be incorporated into the project with the submittal of a work plan and Regional Water Board's Executive Officer's concurrence.
3. The injection of the reducing agent, or an alternate reducing agent, shall not produce airborne hydrogen sulfide concentrations that exceed 0.03 parts per million by volume (ppmv), vinyl chloride concentrations that exceed 0.01 ppmv, or methane 10% above the lower explosive limit (LEL).
4. When the remedial action is completed, the pollutant breakdown products, amendments, and by-products shall not exceed pre-injection (baseline) concentrations within or outside the treatment area.

### **C) PROVISIONS**

1. A copy of this Order shall be kept at all times at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
2. The Discharge shall comply with all requirements, conditions and provisions set forth in Monitoring and Reporting Program Order No. R1-2009-0067. The Executive Officer of the Regional Water Board has discretion to modify provisions of the Monitoring and Reporting Program, as necessary to protect human health and the environment.
3. The Discharger shall comply with all mitigation measures identified in the Mitigated Negative Declaration titled "Best Cleaners In-situ Treatment of Contaminated Soil and Groundwater," which is attached in appendix A and made part of this Order. The Discharger shall implement the project as described in this Order. Violation of any requirements of the mitigation measures or any other part of this Order may subject the Discharger to enforcement action, including civil liability, under the Water Code.
4. The Discharger shall comply with Monitoring and Reporting Program No. R1-2009-0067 that contains requirements for groundwater and air monitoring, and a contingency plan in the event that Bay Area Air Quality Management District air quality violations are detected, and implement any other contingency plan that are appropriate and necessary, as deemed by the Discharger and the Executive Officer including measures necessary to comply with the Discharge Prohibitions, Discharge Specifications, and all provisions of this Order. The Discharger shall obtain concurrence from the Executive Officer prior to implementation of any contingency measures.

5. Severability

Provisions of these waste discharge requirements are severable. If any provision of these requirements is found invalid, the remainder of the requirements shall not be affected.

6. Operation and Maintenance

The Discharger must maintain in good working order and operate as efficiently as possible, any facility or control system installed by the discharger to achieve compliance with the waste discharge requirements.

7. Change in Ownership

In the event of any change in control or ownership of land presently owned or controlled by the Discharger, the Discharger must notify the succeeding owner of the existence of this Order.

8. Vested Rights

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the Discharger from his liability under federal, state, or local laws, nor create a vested right for the Discharger to continue waste discharge.

9. Monitoring

The Discharger must comply with the Contingency Planning and Notification Requirements Order No. 74-151 and Monitoring and Reporting Program R1-2009-0067 and any modifications to this document as specified by the Executive Officer. Such documents are attached to this Order and incorporated herein:

- a. Order No. 74-151, which requires immediate incident reporting of unintentional or accidental spills (including emergency response actions) and diligent action to abate the effects of the discharge. Written confirmation of the incident is required within two weeks of notification.
- b. General Monitoring and Reporting Provisions require sampling and analysis performance criteria in addition to compliance reporting criteria and time frames.

10. Inspections

The Discharger shall permit authorized staff of the Regional Water Board:

- a. entry upon premises where injection is being conducted or in which any required records are kept;

- b. access to copy any records required to be kept under terms and conditions of this Order;
- c. inspection of monitoring equipment or records; and
- d. sampling of any discharge.

#### 11. Noncompliance

In the event the Discharger is unable to comply with any of the conditions of this Order due to:

- a. breakdown of equipment;
- b. accidents caused by human error or negligence; or
- c. other causes such as acts of nature;

The Discharger shall notify the Executive Officer by telephone as soon as he or she has knowledge of the incident, and shall confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate the steps taken to correct the problem and the dates thereof, and the steps being taken to prevent the problems from recurring.

#### 12. Significant Changes in Discharge

The Discharger shall notify the Regional Water Board before making any significant change or proposed change in the character, location, or volume of the discharge. The Discharger shall file a report of Waste Discharge, and a new order is required for any significant changes.

#### Certification

I, Catherine Kuhlman, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on October 1, 2009.

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Catherine Kuhlman  
Executive Officer