

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 AEROVISTA PLACE, SUITE 101
SAN LUIS OBISPO, CALIFORNIA**

DRAFT RESOLUTION NO. R3-2008-0027

Conditional Waiver of Waste Discharge Requirements

For

**GROUNDWATER CLEANUP WITH
INJECTION OF ACTIVATED CARBON AND ZERO-VALENT IRON
INTO GROUNDWATER
AT
FORMER MISSION LINEN SUPPLY AMBASSADOR LAUNDRY SITE
201 EAST HALEY STREET, SANTA BARBARA
SANTA BARBARA COUNTY**

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

1. California Water Code Section 13260(a) requires that any person discharging waste, or proposing to discharge waste within any region that could affect the quality of the waters of the state, other than into a community sewer system, shall file with the appropriate Water Board, a report of the discharge ("report of waste discharge" or "ROWD") or other report containing such information and data as may be required by the Water Board.
2. California Water Code Section 13263 authorizes the Water Board to prescribe waste discharge requirements that implement the Water Board's Water Quality Control Plan.

California Water Code Section 13269 authorizes the Water Board to waive the issuance of waste discharge requirements provided that the waiver of waste discharge requirements is consistent with applicable water quality control plans and is in the public interest. In addition, any waiver must be conditional, may not exceed five years in duration, and the Water Board may terminate the waiver at any time. The waiver must also include monitoring unless the Water Board determines that the discharges do not pose a significant threat to water quality.

3. This Resolution conditionally waives waste discharge requirements for the in-situ remediation by the addition of the Former Mission Linen Supply.

Background

4. The subject site is located at 201 East Haley Street in Santa Barbara and occupies parcel 16 of block number 202 at the north corner of Haley and Santa Barbara Streets. Mission Linen Supply (Mission) performed limited dry cleaning operations at the site, then known as the Ambassador Laundry, until 1988 when dry cleaning operations ceased. Mission demolished the facility structures in 1996-1997 and with the exception of activities related to soil and groundwater remediation, the property has been vacant since that time. During the period when dry cleaning was performed at the site, tetrachloroethene (PCE), was discharged to the subsurface surrounding the facility and ultimately into shallow groundwater, as a result of equipment seal failure(s).

5. In April of 1988, the Water Board issued Cleanup and Abatement (CAO) Order No. 88-89 requiring abandonment of an onsite supply well, characterization and remediation of groundwater with volatile organic compound (VOC) wastes beneath the site and surrounding area, and a schedule for completing these activities.
6. In response to CAO Order No. 88-89 and a request for a Corrective Action Work Plan, Mission performed a number of tasks including:
 - Abandonment of the onsite supply well,
 - Characterization of waste discharges to the Shallow Zone (Shallow Zones 1 through 5) and the Upper Producing Zone (UPZ);
 - Construction and operation of a groundwater extraction and treatment (GWE&T) system;
 - Construction and operation of a Soil Vapor Extraction and Treatment system (SVE);
 - Implementation of a three-phase in-situ remediation program using chemical oxidation for source removal; and
 - Bioremediation field pilot testing using emulsified oil substrate to evaluate the ability of microbes and indigenous bacteria to breakdown remaining dissolved PCE and associated daughter products from groundwater.
7. Monitoring data indicates that groundwater beneath the site contains PCE and daughter products and that the waste plume extends generally in the direction of groundwater flow beneath neighboring properties located to the northeast, terminating near the intersection of Haley and Garden Streets (Figures 1 and 2). In October 1990, Mission reported the highest concentration of PCE in source area monitoring well 13-01 at 42,000 µg/L. PCE daughter products, primarily trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and 1,1-dichloroethene, have also been detected, although typically at much lower concentrations. Mission's remediation activities, specifically the in-situ chemical oxidation program and the subsequent bioremediation pilot test, have reduced PCE and VOC concentrations in the source area and in readily accessible downgradient locations. For example, the PCE concentration detected in downgradient well 73-01 decreased from a maximum of 5,400 micrograms per liter (µg/L) in February 2004 to non-detectable in December 2007. However, due to limited access for reagent injection, areas of elevated solvent concentrations remain in some offsite locations. Mission detected PCE at a maximum concentration of 3,000 µg/L in well 42-02 in August 2007.
8. Since the bioremediation pilot test began in 2007, Mission has reported low concentrations of vinyl chloride (VC) in two wells. Transient detections of VC are expected as part of the accelerated biodegradation of PCE because of stimulation of indigenous bacteria during the pilot test. Mission monitors for VC in groundwater and will implement its contingency plan to mitigate VC concentrations that pose a potential inhalation risk.
9. During the August 2007 sampling round, depth to groundwater in the Shallow Zone 1 (SZ1) unit, ranged from approximately 6 to 12 feet below ground surface (bgs), which corresponds with a groundwater elevation of about 1 to 13 feet above mean sea level. Deeper water-bearing zones are generally under artesian conditions and the vertical hydraulic gradient is upward with many of the deeper wells under flowing artesian conditions. The horizontal groundwater flow direction is estimated to be generally from the southwest to northeast with a horizontal gradient of about 0.014 feet/foot in SZ1. Although

generally in an easterly direction, horizontal flow in deeper Shallow Zone units is heavily influenced by the presence or absence of confining layers and somewhat by variable flow conditions in the deeper upper producing zone (UPZ) that is pumped by the City of Santa Barbara. An adequate monitoring program is currently in place to monitor influences from UPZ pumping on the waste and groundwater elevations in the Shallow Zone units.

10. On January 10, 2008, Mission's consultant, URS Corporation, submitted a report titled "*Interim Remedial Action Work Plan*" (Work Plan). In this Work Plan, Mission proposes to inject activated carbon and zero-valent iron (ZVI) into shallow groundwater at 235 East Haley Street, a property near the downgradient extent of the waste plume where relatively high concentrations of PCE remain. Because a fire destroyed the structures on this nearby property, Mission recently secured a right-of-entry agreement with the new property owners to conduct cleanup work at this location before the property owner develops the property into mixed residential/commercial units. Given the limited time-frame that the property (235 East Haley Street) is likely to remain accessible (18 to 24 months), and because the carbon acts to trap the VOCs while treatment by in-situ chemical reduction occurs, it is anticipated that there will be sufficient residence time for complete degradation to the innocuous compounds, ethene and ethane. Central Coast Water Board staff anticipates few additional degradation products during performance monitoring subsequent to injection. Mission is required to analyze for PCE and its daughter products, dissolved iron, pH, temperature and other field parameters to ensure that adverse affects to designated beneficial use outside the treatment zone does not occur.
11. Mission will mix the activated carbon and ZVI with potable water to create a slurry. Activated carbon and ZVI are non-hazardous and do not contain other metals that may pose a threat to water quality. Prior to injecting the activated carbon and ZVI slurry, Mission will confirm injection depths based on advancement of four soil borings for collection of site-specific lithologic information. Mission will drill injection boreholes using a direct push drill rig to the desired injection depths and Mission will inject the activated carbon and ZVI slurry directly into the shallow water-bearing zone. Mission proposes to drill approximately 36 injection boreholes and injection locations will be spaced approximately 15-feet apart to allow for adequate subsurface distribution of the activated carbon and ZVI slurry. SZ1 injection depths will likely range from 11 to 15 feet bgs, and Shallow Zone 2 (SZ2) depths from 17 to 30 feet bgs. Mission proposes to inject approximately 20 pounds of activated carbon and ZVI product mixed with 100 gallons of water for a total of 10 injections per borehole. Mission estimates a total of 200 pounds of reagent and 1,000 gallons of water injected per borehole. Mission will record the Injection parameters including location, volume of product, and injection rate and pressure at each borehole location. After injection at each location is complete, Mission will properly abandon boreholes.
12. After the injection begins, chlorinated solvent wastes will be trapped by the carbon, where oxidation/reduction reactions occur, with a sequential release of chlorine atoms (reductive dechlorination). Because the carbon acts to trap the solvents while treatment by in-situ chemical reduction occurs, it is anticipated that there will be sufficient residence time for complete degradation to the innocuous compounds, ethene and ethane. Mission will be required to evaluate the effect of ISCR on groundwater quality under Monitoring and Reporting Program (MRP) No. R3-2008-0027.
13. The California Department of Public Health (DPH) has published a Secondary Maximum

Contaminant Level (taste, odor, laundry) for iron of 0.3 milligrams per liter (mg/L). Historical analytical results for the site suggest that naturally occurring iron in groundwater often results in concentrations greater than this secondary limit. However, because any iron produced by the activated carbon and ZVI process is expected in an oxidized state (Fe^{3+} or ferric iron) and immobile, it is not anticipated that that the process will result in significantly increased dissolved iron concentrations. Mission is required to monitor for dissolved iron as part of Monitoring and Reporting Program (MRP) No. R3-2008-0027.

Legal Requirements

14. The Water Quality Control Plan for the Central Coast Region (Basin Plan) designates the beneficial uses of waters within the Region, specifies the water quality objectives to protect the beneficial uses, establishes prohibitions, and establishes implementation policies to implement the water quality objectives. Pursuant to Chapter 2 of the Basin Plan, present and potential beneficial uses of groundwater (both shallow and deeper water-bearing zones) underlying the Property include domestic and municipal water supply, agricultural water supply, and industrial water supply. The Basin Plan incorporates the state's drinking water standards adopted by DPH as water quality objectives.
15. The Water Board finds that this waiver of waste discharge requirements is consistent with Water Code section 13269.
 - The injection of activated carbon and ZVI into the shallow groundwater will significantly improve groundwater quality by degrading the PCE to below the applicable water quality objectives, which are consistent with the Basin Plan.
 - The injection is proposed and is required by the conditions of this waiver to occur in a manner that will not be a significant threat to human health and the environment or result in long-term exceedances of applicable water quality objectives.
16. The Dischargers will observe reasonable practices to minimize the deleterious effects of the discharge;
 - Whether a feasible treatment method exists to control the constituents in the discharge; and
 - The conditions of this waiver protect beneficial uses by:
 - a) Prohibiting pollution, contamination, or nuisance;
 - b) Requiring monitoring and compliance with applicable water quality control plans; and
 - c) Requiring the Discharger to grant access to Water Board staff to perform inspections.
 - d) Requiring significant reductions of waste in shallow groundwater.
17. Individual groundwater remediation systems as described herein are categorically exempt from California Environmental Quality Act (CEQA), California Code of Regulations, Title 14, Section 15303.
18. Pursuant to California Water Code Section 13269, this action waiving the issuance of waste discharge requirements for injection of activated carbon and ZVI: (a) is conditional, (b) may be terminated at any time, (c) does not permit an illegal activity, (d) does not preclude the need for permits which may be required by other local or governmental

agencies, and (e) does not preclude the Water Board from administering enforcement remedies (including civil liability) pursuant to the California Water Code.

19. Application of activated carbon and ZVI into shallow groundwater is consistent with State Water Resources Control Board (State Water Board) Resolution No. 68-16 ("Policy for Maintenance of the High Quality of Waters of the State"). State Water Board Resolution No. 68-16 requires the Water Board to maintain the high quality of waters of the state unless the Water Board determines that some degradation of waters is consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than set forth in the Basin Plans. The Water Boards must assure that waste discharge requirements will result in best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and the highest water quality is maintained. In short, the degradation may not violate water quality objectives and must not unreasonably affect existing and designated beneficial uses. The activated carbon and ZVI injection is consistent with Resolution 68-16 because it is expected to degrade the chlorinated solvents in groundwater to below water quality objectives and, while it may result in some increased concentrations of certain waste constituents, those increased concentrations are expected to be of short duration.
20. In the event that the activated carbon and ZVI injection fails to completely degrade chlorinated solvents in groundwater, the Executive Officer may require the Discharger to take other remediation actions in the treatment area.
21. The monitoring and reporting requirements of this Order are imposed pursuant to California Water Code Section 13267. The monitoring and reporting are necessary to ensure compliance with the conditions of this Order and to verify the adequacy and effectiveness of the conditions.
22. Central Coast Water Board staff issued a public notice of the staff report and proposed Resolution No. R3-2008-0027 on February 21, 2008, to all neighbors within 500 feet of the groundwater plume emanating from the Mission property and allowed a 30 day public comment period.
23. The Water Board conducted a public hearing on March 21, 2008, in Salinas, California, and considered all comments and evidence concerning this matter.

THEREFORE BE IT RESOLVED:

1. In accordance with California Water Code Sections 13267 and 13269, waste discharge requirements for the proposed groundwater remediation technology are hereby waived subject to the following conditions:
 - a) The injection of activated carbon and ZVI into shallow groundwater shall not create a condition of pollution, contamination, or condition of nuisance, as defined by California Water Code Section 13050.
 - b) The Discharger shall notify Water Board staff immediately of any proposed change(s) in discharge volume, nature, or location of the proposed activated carbon and ZVI slurry injection described in the Work Plan.
 - c) The injection of activated carbon and ZVI shall not result in long-term exceedances in pH or

- dissolved iron concentrations above water quality objectives outside of the application area.
- d) The Discharger shall notify Water Board staff immediately of any discharges threatening water quality or public health.
 - e) The Water Board may inspect the site at any time to evaluate compliance with this Region's Basin Plan and this waiver.
 - f) Mission is required to notify Central Coast Water Board staff 72 hours prior to conducting the activated carbon and ZVI injection.
 - g) Waste discharged shall not cause groundwater to contain concentrations of chemical substances or its by-products in amounts that adversely affect any designated beneficial use, outside the application area or treatment zone.
 - h) The discharge of wastes shall not cause the pH of the receiving groundwater downgradient of the application area to be beyond the range of 6.5 and 8.5.
 - i) Pursuant to California Water Code Section 13267, the Discharger shall comply with MRP No. R3-2008-0027.
2. This Waiver shall not create a vested right and the Discharger shall consider all such discharges a privilege, as provided for in California Water Code Section 13263.
 3. The Executive Officer or Water Board may terminate the applicability of the Waiver described herein at any time.
 4. This Waiver shall become effective on **March 21, 2008**, and shall expire on **March 21, 2013**.
 5. As provided by California Water Code Section 13350(a), any person may be civilly liable if that person is in violation of a waiver condition or waste discharge requirements, intentionally or negligently discharges waste, or causes waste to be deposited where it is discharged, into the waters of the State and creates a condition of pollution or nuisance.
 6. Any person affected by this action of the Water Board may petition the State Water Board to review the action in accordance with section 13320 of the California Water Code and Title 23, California Code of Regulations, Section 2050. The State Water Board must receive the petition within 30 days of the date of this Resolution. Water Board staff can provide copies of the law and regulations applicable to filing petitions upon request.

I, Roger W. Briggs, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a Resolution adopted by the California Water Quality Control Board, Central Coast Region, on March 21, 2008.

Roger W. Briggs
Executive Officer