California Regional Water Quality Control Board
San Francisco Bay Region

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Certified Mail Nos.

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Ms. Nancy Ellicock
Ms. Elizabeth Young
Mr. John V. Hook
Mr. Steven Pucell
c/o Mr. Daniel C. Helix
P.O. Box 6144
Concord, CA 94524

SUBJECT: Transmittal of Order No. R2-2007-0009 – Final Site Cleanup Requirements for Hookston Station Site, 228 Hookston Road, Pleasant Hill, Contra Costa County

Dear Messrs. Grant, Helix, Kennedy, Hook, and Pucell and Mses. Helix, Ellicock and Young:

Enclosed is Order No. R2-2007-0009 which was adopted by the Water Board on January 23, 2007.

If you have any questions, please contact Elizabeth Allen at (510) 622-2332 [e-mail eallen@waterboards.ca.gov].

Sincerely,

Bruce H. Wolfe
Executive Officer

Enclosure: Order No. R2-2007-0009 – Final Site Cleanup Requirements, Hookston Station
cc w/encl: see next page

cc w/encl:

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. R2-2007-0009

ADOPTION OF FINAL SITE CLEANUP REQUIREMENTS AND RESCISSION OF ORDER NOS. R2-2003-0035 AND R2-2004-0081 FOR:

UNION PACIFIC RAILROAD COMPANY
DANIEL C. and MARY LOU HELIX, ELIZABETH YOUNG, JOHN V. HOOK, NANCY ELLICOCK, STEVEN PUCELL,
AND CONTRA COSTA COUNTY REDEVELOPMENT AGENCY

for the property referred to as:

HOOKSTON STATION

and located at
228 HOOKSTON ROAD
PLEASANT HILL, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Board), finds that:

1. **Site Location:** The Hookston Station site (herein referred to as "the Site") is located at the intersection of Hookston and Bancroft Roads in Pleasant Hill, California (Attachment A, Figure 1, Site Location Map). The Site covers approximately 8 acres, and the area is currently occupied by mixed commercial and light industrial businesses. Commercial industries are located immediately to the west of the property, and storage and landscape materials businesses are located to the north. A high-density housing complex is present immediately across the northeast edge of the property. Land use in the Site vicinity is a mixture of residential and commercial.

2. **Site History:** The Site was owned and operated by Southern Pacific Transportation Company (SPTCo) from June 1891 until September 1983 as a portion of the San Ramon Branch line, which once connected Avon to San Ramon, California. The Site included a freight loading platform with railroad sidings and was used for loading of fruit and lumber. Between approximately 1965 and 1983, the land was developed into a mixed light industrial business complex. A former tenant at the Site, E-T Industries, Inc. (formerly known as Wheel Centre, Inc., and also known as "ET Mags") and Cal-Motive Industries, Inc. (also once known as "ET Mags"), manufactured chrome and alloy wheels and used trichloroethylene (TCE), a chlorinated solvent. ET Mags went into bankruptcy and is no longer in existence. The property was transferred from SPTCo to Mr. and Mrs.

Dan Helix in 1983, and the Contra Costa County Redevelopment Agency (CCCRA) subsequently purchased the eastern portion of the Site in 1989. The western portion of the Site is currently owned by Mr. and Mrs. Dan Helix, Ms. Elizabeth Young, Mr. John V. Hook, Ms. Nancy Ellicock, and Mr. Steven Pucell (collectively the Hookston Plaza owners). CCCRA owns the eastern portion of the Site.

Environmental investigations regarding the presence of chemicals in soil and ground water at the Site were conducted between 1989 and 1996 by various environmental consulting firms on behalf of CCCRA and the Hookston Plaza owners. These investigations discovered the presence of both petroleum-based products and chlorinated solvents in soil and groundwater at the Site. Several recent studies have included a soil vapor study, soil and groundwater sampling, indoor air sampling, and a human health risk assessment.

The initial environmental investigations by Harding Lawson Associates (HLA, January 1990 and June 1990) were completed for the Contra Costa County Public Works Department (on behalf of CCCRA) in support of the proposed purchase by CCCRA of the eastern portion of the property. Following the discovery of chemical impacts to soil and ground water at the Site, Engeo, Inc. (1991 to 1992) and Treadwell & Rollo, Inc. (1993 to 1996) performed additional investigations on behalf of the Hookston Plaza owners. These later investigations were performed to support pending litigation between the Hookston Plaza owners, CCCRA, SPTCo, and others. Union Pacific Railroad (UPRR) assumed SPTCo's responsibilities for this Site following its merger with SPTCo in 1997.

3. **Named Responsible Parties:** UPRR is named as a Responsible Party because it is the successor in interest to SPTCo, which owned the 8-acre property during or after the time of the activities that resulted in the discharge, and had the legal ability to prevent the discharge. CCCRA is named as a Responsible Party because it owned the eastern portion of the 8-acre property during or after the time of the activities that resulted in the discharge, has knowledge of the discharge or the activities that caused the discharge, and has the legal ability to prevent the discharge. The Hookston Plaza owners are named as Responsible Parties because they owned the 8-acre property during or after the time of the activities that resulted in the discharge, have knowledge of the discharge or the activities that resulted in the discharge, and have the legal ability to prevent the discharge.[1]

[1] The current owners of the property (CCCRA and Hookston Plaza) have the legal authority to prevent the ongoing discharge of pollutants to groundwater. On-going migration of contaminants through leaching from soil into groundwater and movement with the groundwater is also considered a release of contaminants to the environment. The State Board has adopted various orders (e.g., Zoecon Corp (WQ 86-2); Spitzer (WQ 89-8)) that establish that owners are responsible for discharges that are currently occurring on their property, even if the initial discharge occurred before they owned it or was caused by someone else (frequently a lessee).

If additional information is submitted indicating that other parties caused or permitted any waste to be discharged on the site where it entered or could have entered waters of the State, the Board will consider adding those parties' name to this Order.

4. **Regulatory Status:** This site was subject to the following Board orders:

Site Cleanup Requirements Order NO. R2-2003-0035 adopted April 16, 2003, as amended by Order NO. R2-2004-0081, adopted September 15, 2004.

5. **Site Hydrogeology:** Previous investigations have identified three apparently distinct hydrogeologic zones, based on the observed stratigraphy, occurrence of groundwater, and general water quality. The zones are defined by hydrogeology, and the specific depths vary accordingly. Fine-grained clays and silts are present from the ground surface (or immediately below the ground surface cover materials) to depths up to 40 ft bgs. This zone, identified as the A-Zone, contains discontinuous lenses of sands, silty sands, and gravelly sands that are interbedded in the fine-grained deposits. The coarser grained lenses range in thickness from a few inches to approximately 11 ft, but are more commonly only a few feet thick.

Beneath the A-Zone is the B-Zone, between the approximate depths of 30 and 70 ft bgs, a relatively continuous sand unit that is interbedded with silt and clay lenses. The sands of the B-Zone are generally 5 to 10 ft thick and range from well-sorted sands and clayey sands to gravelly sands. A few gravel zones are also encountered in the B-Zone. The silt and clay lenses within the B-Zone are up to 10 ft thick, but are generally less than a few feet thick. A clay unit that is 10 to 40 ft thick is present at the base of the B-Zone.

The C-Zone lies beneath the B-Zone and is initially encountered at depths ranging from 65 to 97 ft bgs. The C-Zone is also a continuous sand unit that is interbedded with silt and clay lenses. The C-Zone has not been characterized deeper than 100 ft bgs.

Potentiometric ground water levels have historically ranged from approximately 12 to 23 bgs in the A-Zone, 13 to 24 ft bgs in the B-Zone, and 16 to 21 ft bgs in the C-Zone. Groundwater in the three zones generally flows toward the north to northeast. The overall hydraulic gradients in the three zones have typically ranged from 0.001 to 0.004 foot per foot (ft/ft). Based on groundwater level measurements and stratigraphy, the three water-bearing zones are confined to semi-confined.

The nearest surface water body is the Walnut Creek Channel, used for flood control by the Contra Costa County Flood Control District. The creek flows northward for several miles before emptying into the Suisun Bay. It is unlined in the vicinity of the Hookston Station Site and is secured from public access by permanent fencing.

6. **Adjacent Sites:** The western side of the Site is bordered by several commercial and light-industrial properties, including Haber Oil Products Company (also known as Pitcock Petroleum), a petroleum product distribution facility. Soil and groundwater investigations at this facility have indicated impacts by petroleum hydrocarbons. Chlorinated solvents have also been detected in groundwater at Haber Oil. The Board currently requires Haber Oil to collect quarterly groundwater samples for petroleum hydrocarbon and chlorinated solvent analyses. Offsite groundwater investigation by Haber Oil indicates that a plume of methyl tert-butyl ether (MTBE) extents northeastward at least 600 ft from the Haber Oil site. Additional investigation and cleanup are pending.

Soil vapor studies and subsurface investigations conducted in the vicinity of the Site indicate have detected PCE and associated degradation products, including TCE, in groundwater to the west (upgradient) of the Site. These findings indicate that there are offsite sources of VOCs that are migrating onto the Hookston Station Site.

Board staff has requested information from the upgradient off-Site property owners and operators regarding site operations, and has required subsurface investigations at these properties. The investigations indicate there has been a release of PCE at one or more of these off-Site properties. Board staff is working with the upgradient property owners to further investigate the source and extent of the VOCs associated with this release.

7. **Remedial Investigation:** Remedial Investigation (RI) activities were conducted at the Site and in the vicinity of the Site between 1990 and 2004. The investigations were conducted in a phased approach and involved the collection of soil, soil vapor, ground water, surface water, sediment, ambient (outdoor) air, and indoor air samples. Analytical data indicates that dissolved VOCs are primarily observed in the coarse-grained deposits of the A- and B-Zones found above 70 ft bgs. The TCE plume extends about 2,000 feet northeast of the Site, beneath the Colony Park residential neighborhood and to the Walnut Creek Channel.

The RI report, dated August 2004, summarized all subsurface investigations completed to that time, and the FS report, dated July 2006, incorporated additional data acquired after submittal of the RI report. The RI data adequately define the lateral and vertical extent of on-site soil contamination and the lateral and vertical extent of the on- and off-Site portions of the groundwater plume. Additional data are needed to refine our understanding of the occurrence of Site-related chemicals in soil vapor and indoor air.

a. <u>Soil</u>

VOCs have been analyzed in 273 soil samples collected from 86 locations throughout the Site. TCE was the most common VOC detected in soil. Low

concentrations of TCE have been reported in soil samples across the Site, typically in the 100 to 200 micrograms per kilogram (µg/kg) range. The greatest TCE concentration of 2,580 µg/kg was reported in the southwest portion of the Site, adjacent to where ET Mags formerly operated.

b. Soil Vapor

Passive and active soil vapor surveys were conducted during the RI. During the active soil vapor survey, concentrations of TCE in soil vapor greater than the Environmental Screening Levels (ESLs) were detected at one location at the Site and three locations in the Colony Park neighborhood. The results of this study led to the collection and analysis of indoor air samples (see below). Permanent soil vapor monitoring probes were installed in April 2005 at ten locations in the Colony Park neighborhood, and are sampled on a quarterly basis. Six of these probes are located in areas where TCE concentrations were recently greater than 500 micrograms per liter (µg/l) in A-Zone groundwater (the "core" of the A-Zone groundwater plume). The four remaining vapor probes are located within utility corridors outside the surface "footprint" of the A-Zone and B-Zone groundwater plumes. Additional monitoring points are needed outside the core plume area and on the northwest side of the plume. TCE is the most frequently detected VOC in the soil vapor from probes overlying the core of the A-Zone groundwater plume. PCE, cis-1,2-DCE, vinyl chloride, and benzene have also been detected at concentrations greater than their respective ESLs at one or more locations. PCE and benzene do not originate from the Hookston Station site

c. Groundwater

Quarterly groundwater monitoring has been performed at the Site using the 44 wells within the monitoring network. Maximum concentrations of the most common VOCs detected in ground water monitoring wells either on or downgradient of the Site are summarized in the following table (third quarter 2006 data).

Chemical	Well	Concentration (µg /l)	MCL* (µg/l)
PCE	MW-7	340	5
TCE	MW-11B	15,000	5
cis-1,2-DCE	MW-14A	2,400	6
trans-1.2-DCE	MW-13A	17	10
1,1-DCE	MW-11B	1,100	6
Vinyl chloride	MW-16A	180	0.5
1,1,1-TCA	MW-13B	2.5	62
1,1,2-TCA	MW-13B	6.1	5

Benzene	MW-25A	0.15 J	1

*State of California Maximum Contaminant Level

d. Indoor and Ambient (Outdoor) Air

As part of the RI and risk assessment activities, indoor and ambient (outdoor) air samples were collected from locations at the Site during December 2003. Onsite indoor air sampling reported concentrations up to 4.9 micrograms per cubic meter ($\mu g/m^3$) TCE and 1.4 ug/m3 cis-1,2-DCE. The commercial/industrial indoor air ESL was exceeded only for TCE on-Site.

Indoor, crawl space, and ambient air samples were also collected from designated homes in the Colony Park neighborhood during January-September 2004 and August 2005-January 2006. Samples for TCE analysis were collected from 47 private residences. Indoor air at nine of the residences contained concentrations of TCE in indoor air that exceed the residential ESL (1.2 $\mu g/m^3$). These residences are generally located within the surface "footprint" of the core of the A-Zone groundwater plume. PCE, which is not a chemical of concern that originates from the Hookston Station Site, was detected at concentrations exceeding the indoor air ESL of 0.41 $\mu g/m^3$ in 15 residences. These residences are located throughout the Colony Park neighborhood. Benzene was detected above the ESL of 0.085 $\mu g/m^3$ in the indoor air of all of the 42 residences sampled during August 2005-January 2006. Benzene is a constituent of gasoline that is commonly detected in urban/suburban air and is not a chemical of concern associated with the Hookston Station Site.

e. Surface Water and Sediments

Water quality samples collected from the Walnut Creek channel indicated the presence of low concentrations of PCE, TCE, and cis-1,2-DCE, in the surface water samples. All these concentrations were below the applicable National Ambient Water Quality Criteria and the California Inland Surface Waters Criteria for protection of aquatic organisms and human health via ingestion of aquatic organisms. Sediment samples were collected along the unlined portion of the Walnut Creek channel, and no VOCs were detected in any of these samples.

8. **Interim Remedial Measures:** The Responsible Parties have taken interim remedial actions to prevent exposure to VOCs in groundwater and indoor air. Based on the results of the 2004 indoor air sampling event, the Responsible Parties offered to install vapor intrusion prevention systems in all homes that contained TCE concentrations that were greater than the residential ESL of 1.2 micrograms per cubic meter (μ/m^3). Results from the August 2005-January 2006 sampling event show that the homes where the vapor

intrusion prevention systems were installed, which previously exceeded the ESL for TCE, now contain TCE concentrations below the ESL. The Responsible Parties offered to install vapor intrusion prevention systems in additional homes following the August 2005-January 2006 sampling event. As of June 2006, vapor intrusion prevention systems have been installed in seven residences, and a monitoring program has been implemented for those homes.

The Responsible Parties conducted private well surveys for nearly 600 homes located in the vicinity of the Site during 2003. The surveys identified twelve private backyard wells located in the Colony Park neighborhood and within the surface "footprint" of the A-Zone and B-Zone groundwater plumes. To eliminate potential exposure to impacted groundwater and potential cross-contamination of the water-bearing zones, the Responsible Parties offered to properly close (i.e., abandon) these twelve wells. The well closures involve removing well pumps and electrical systems, followed by pressurized grouting to seal the well from further use. As of the end of August 2006, eight wells have been abandoned and are no longer used. The owners of the four remaining wells indicated that they do not use the wells, or the wells are used for irrigation purposes only.

The Interim Remedial Measures implemented by the Responsible Parties have served to eliminate off-Site exposures to TCE at concentrations above conservative theoretical risk-based screening levels (see Finding 9); however these measures must remain in place (including installation of additional vapor intrusion prevention systems and decommissioning of private wells, where needed) until the appropriate cleanup goals for groundwater and soil vapor are achieved.

9. **Environmental Risk Assessment**: The Baseline Risk Assessment (CTEH; February 24, 2006) quantifies the theoretical lifetime risks to the community from the Hookston Station Site and other upgradient sources, and provides the framework to evaluate potential remedial actions. The report identifies the primary exposure pathways that drive the cleanup plan – vapor intrusion into indoor air and potential future use of groundwater. The report presents two estimates of exposure and theoretical risk that potentially result from inhalation of chemicals in residential indoor air. Board staff considers the higher inhalation rates used for the second exposure estimate to be upper-bound rates that conservatively estimate the maximum credible exposure by offsite child and adult residents.

The theoretical lifetime excess cancer risk estimates for onsite commercial/industrial worker inhalation of TCE in indoor air is 2.4×10^{-6}. Theoretical lifetime excess cancer risk associated with construction worker exposure to chemicals in onsite soil is 4.3×10^{-5}, due largely to elevated arsenic concentrations in two of 19 surface soil samples.

The theoretical lifetime excess cancer risk for off-site residents exposed to volatile organic compounds in indoor air risk is up to 8.0×10^{-5}, depending on the residential location

sampled. Calculated "worst-case" theoretical lifetime excess cancer risks associated with groundwater use for irrigation and filling a swimming pool are $6.8x10^{-6}$ and $8.1x10^{-6}$, respectively. The theoretical lifetime excess cancer risk resulting from inhalation of VOCs volatilizing from surface water (Walnut Creek) is calculated to be $1.6x10^{-6}$, due primarily to PCE, a chemical that does not originate from the Site. The cumulative "worst-case" theoretical excess lifetime cancer risk for offsite residents exposed to VOCs in indoor air, groundwater, and surface water range is $9.65x10^{-5}$.

For comparison, the Board considers the following risks to be acceptable at remediation sites: a cumulative hazard index of 1.0 or less for non-carcinogens and, for carcinogens, a cumulative excess cancer risk of $1x10^{-6}$ or less (residential scenario) or $1x10^{-5}$ or less (commercial/industrial scenario).

Findings 8 and 11 describe management of excess risk.

10. **Feasibility Study:** The Feasibility Study (ERM; July 10, 2006) was developed to evaluate potential remedial alternatives and develop a cleanup plan. The following Remedial Action Objectives were developed for the Hookston Station Parcel and downgradient impacted area:

1. Protect human health from potentially impacted indoor air by reducing concentrations of chemicals that originate from the Hookston Station Parcel in indoor air to levels of one-in-a-million theoretical lifetime excess cancer risk for carcinogens, or a hazard index of 1 for non-carcinogenic risks.
2. Protect human health from possible future consumption or contact with ground water containing chemicals above risk-based cleanup goals that originate from the Hookston Station Parcel by preventing future extraction of VOC-impacted ground water for beneficial uses (e.g., domestic, municipal, or industrial water supply) until the final ground water cleanup goals are achieved.
3. Protect human health from incidental ingestion, dermal contact, and inhalation of particles from subsurface soil (deeper than 0.5 feet bgs) at a limited area on the Hookston Station Parcel.
4. Achieve restoration of ground water impacted by chemicals that originate from the Hookston Station Parcel for existing and potential beneficial uses.

The RPs considered many cleanup options, which were compared and contrasted against one another in the FS. Cleanup alternatives discussed in the FS include (1) no action; (2) monitored natural attenuation; (3) enhanced bioremediation in the A-Zone and in-situ chemical oxidation in the B-Zone; (4) permeable reactive barrier (PRB) in the A-Zone and in-situ chemical oxidation in the B-Zone; (5) PRB in the A- and B-Zones; and (6) pump and treat in the A- and B-Zones. Alternatives 2 through 6 also include exposure prevention activities, which include vapor intrusion prevention systems, removal of

private irrigation wells, institutional controls to restrict future development of water supplies in the impacted area, and a soil management plan for a small area of on-site soils impacted by arsenic.

The FS evaluated the alternatives using criteria established by USEPA:

- Overall protection of human health and the environment
- Compliance with Applicable or Relevant and Appropriate Requirements
- Long-term effectiveness
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Implementability
- Cost
- Community Acceptance
- Regulatory Acceptance

11. **Remedial Action Plan**: The detailed and comparative analysis presented in the FS provides a basis for determining which remedial alternative is most appropriate for protecting human health and the environment and managing long-term risk. The preferred cleanup alternative (Remedial Alternative 4) includes the following components:

    - Zero-valent iron PRB for A-Zone ground water;
    - Chemical oxidation for B-Zone ground water;
    - Institutional controls for a single location of arsenic-impacted subsurface soil on the Hookston Station Parcel in the form of a soil management plan;
    - Vapor intrusion prevention systems;
    - Removal of private wells from residences that overlie the A-Zone and B-Zone groundwater plumes;
    - Institutional controls to restrict future development of water supplies within the impacted area until final ground water cleanup goals are achieved.

The Remedial Action Plan does not propose active remediation for VOCs in soil, because ESLs were exceeded for only TCE and cis-1,2, DCE, and the five locations where the ESLs were exceeded are all beneath one of the commercial buildings at the Site. The potential for soil leaching at these locations is reduced significantly because the existing structure prevents rainfall from percolating into the subsurface. Should site conditions change and the buildings be removed, soil cleanup standards will apply and soil cleanup may be needed.

Due to excess risk that will be present at the Site pending full remediation (see Finding 9), institutional constraints are appropriate to limit on-Site exposure to acceptable levels. Institutional constraints include a deed restriction that notifies future Site owners of sub-surface contamination, prohibits the use of shallow groundwater beneath the Site as a

source of drinking water until cleanup standards are met, and prohibits sensitive uses of the Site such as residences and daycare centers.

12. **Basis for Cleanup Standards**

a. **General**: State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in exceedance of applicable water quality objectives. This order and its requirements are consistent with Resolution No. 68-16.

State Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

b. **Beneficial Uses**: The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in Title 23, California Code of Regulations, Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels. Groundwater underlying and adjacent to the site qualifies as a potential source of drinking water.

The Basin Plan designates the following potential beneficial uses of groundwater underlying and adjacent to the site:

- Municipal and domestic water supply
- Industrial process water supply
- Industrial service water supply

- Agricultural water supply

At present, there is no known use of groundwater underlying the site and in the downgradient area for the above purposes, except for several private wells on residential properties. These wells are reported to be limited to use only for irrigation and filling swimming pools. All residences and businesses are served by the Contra Costa County Water District.

The existing and potential beneficial uses of the Walnut Creek include:

- Water contact and non-contact recreation
- Wildlife habitat
- Cold freshwater and warm freshwater habitat
- Fish migration and spawning

c. **Basis for Groundwater Cleanup Standards**: The groundwater cleanup standards for the Site are shown in Section B.2 below. The standards are based on applicable water quality objectives and are the more stringent of EPA and California primary maximum contaminant levels (MCLs). Cleanup to this level will protect beneficial use of groundwater and will result in acceptable residual risk to humans.

d. **Basis for Soil Cleanup Standards**: The soil cleanup standards for the Site are shown in section B.3 below. Cleanup to this level is intended to prevent leaching of contaminants to groundwater and will result in acceptable residual risk to humans, should site conditions change.

13. **Future Changes to Cleanup Standards**: The goal of this remedial action is to restore the beneficial uses of groundwater underlying and adjacent to the site. Results from other sites suggest that full restoration of beneficial uses to groundwater as a result of active remediation at this site may not be possible. If full restoration of beneficial uses is not technologically or economically achievable within a reasonable period of time, then the Responsible Parties may request modification to the cleanup standards or establishment of a containment zone, a limited groundwater pollution zone where water quality objectives are exceeded. Conversely, if new technical information indicates that cleanup standards can be surpassed, the Board may decide that further cleanup actions should be taken.

14. **Reuse or Disposal of Extracted Groundwater**: Board Resolution No. 88-160 allows discharges of extracted, treated groundwater from site cleanups to surface waters only if it has been demonstrated that neither reclamation nor discharge to the sanitary sewer is technically and economically feasible.

15. **Basis for 13304 Order**: California Water Code Section 13304 authorizes the Board to issue orders requiring a Responsible Party to cleanup and abate waste where the Responsible Party has caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance.

16. **Cost Recovery**: Pursuant to California Water Code Section 13304, the Responsible Parties are hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.

17. **CEQA**: This action is an order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.

18. **Notification**: The Board has notified the Responsible Parties and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.

19. **Public Hearing**: The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the Responsible Parties (or their agents, successors, or assigns) shall cleanup and abate the effects described in the above findings as follows:

A. **PROHIBITIONS**

1. The discharge of wastes or hazardous substances in a manner which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.

2. Further significant migration of wastes or hazardous substances through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. REMEDIAL ACTION PLAN AND CLEANUP STANDARDS

1. **Implement Remedial Action Plan**: The Responsible Parties shall implement the remedial action plan described in Finding 11.

2. **Groundwater Cleanup Standards**: The following groundwater cleanup standards shall be met in all wells identified in the Self-Monitoring Program, unless demonstrated ambient levels are higher:

Constituent	Standard (ug/l)	Basis
TCE	5	MCL
cis-1,2-DCE	6	MCL
trans-1,2-DCE	10	MCL
1,1-DCE	6	MCL
Vinyl chloride	0.5	MCL

The following **indoor air vapor intrusion cleanup standards** shall be met for groundwater in all wells located downgradient of the PRB that are identified in the Self-Monitoring Program in order to provide a basis for removing vapor intrusion prevention systems:

Constituent	Standard (µg/l)	Basis
TCE	530	ESL; vapor intrusion
cis-1,2-DCE	6,200	ESL; vapor intrusion
trans-1,2-DCE	6,700	ESL; vapor intrusion
1,1-DCE	6,300	ESL; vapor intrusion
Vinyl chloride	3.8	ESL; vapor intrusion

3. **Soil Cleanup Standards**: The following soil cleanup standards shall be met in all on-site vadose-zone soils.

Constituent	Standard (mg/kg)	Basis
Arsenic[1]	31	Risk-based
TCE[2]	0.46	ESL; leaching to groundwater
cis-1,2-DCE[2]	0.19	ESL; leaching to groundwater
trans-1,2-DCE[2]	0.67	ESL; leaching to groundwater
1,1-DCE[2]	1.0	ESL; leaching to groundwater
Vinyl chloride[2]	0.019	ESL; leaching to groundwater

[1]Arsenic impacts to shallow soil are being addressed through a Soil Management Plan. No active cleanup is proposed.

[2]Existing site conditions significantly reduce the potential for leaching of VOCs in soil to groundwater. Should site conditions change and the buildings be removed, soil cleanup standards will apply (see Finding 11).

5. **Soil Vapor Cleanup Standards**: The following soil vapor cleanup standards shall be met in all offsite soil vapor monitoring probes:

Constituent	Standard ($\mu g/m^3$)	Basis
TCE	1200	ESL; vapor intrusion
cis-1,2-DCE	7300	ESL; vapor intrusion
trans-1,2-DCE	15,000	ESL; vapor intrusion
1,1-DCE	42,000	ESL; vapor intrusion
Vinyl chloride	32	ESL; vapor intrusion

C. TASKS

1. EXPANSION OF SOIL VAPOR MONITORING NETWORK

a. WORKPLAN

COMPLIANCE DATE: *February 15, 2007*

Submit a workplan and time schedule, acceptable to the Executive Officer, for soil vapor monitoring outside the core groundwater TCE plume area and northwest of

the core plume area. This is to supplement the existing network within the core plume area and southeast of the core plume area.

b. SOIL VAPOR MONITORING NETWORK EXPANSION REPORT
COMPLIANCE DATE: *April 30, 2007*

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified in the Task 1a workplan. The technical report should define the lateral extent of soil vapor pollution down to concentrations at or below the cleanup standards for soil vapor.

2. CHEMICAL OXIDATION PILOT STUDY WORKPLAN

COMPLIANCE DATE: *February 28, 2007*

Submit a workplan and time schedule acceptable to the Executive Office, for completing an in situ chemical oxidation pilot study at the Site to support the Remedial Design and Implementation Plan (see Task 4, below). The workplan shall include a description of the proposed chemical injection program, a health and safety plan, and a pre- and post-injection water quality monitoring plan.

3. REMEDIAL DESIGN AND IMPLEMENTATION PLAN – PERMEABLE REACTIVE BARRIER

COMPLIANCE DATE: *June 29, 2007*

Submit 90% design plans for construction of the permeable reactive barrier to the Executive Officer. Final (100%) design plans may be submitted after contractor selection. The plans shall be consistent with the approved FS. The design plans shall be based on pre-design investigations. A summary of changes to the concept presented in the FS, if any, shall accompany the design plans. The implementation plan shall describe all significant implementation steps and shall include a health and safety plan and an implementation schedule.

4. REMEDIAL DESIGN AND IMPLEMENTATION PLAN – CHEMICAL OXIDATION

COMPLIANCE DATE: *August 31, 2007*

Submit 90% design plans for the chemical oxidation program to the Executive Officer. Final (100%) design plans may be submitted after contractor selection. The plans shall be consistent with the approved FS. The design plans shall be

based on pre-design investigations and the results of the field pilot study in Task 2. A summary of changes to the concept presented in the FS, if any, shall accompany the design plans. The implementation plan shall describe all significant implementation steps and shall include a health and safety plan and an implementation schedule.

5. **IMPLEMENTATION OF CHEMICAL OXIDATION SYSTEM**

COMPLIANCE DATE: *May 15, 2008*

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified for chemical oxidation in Task 4. For ongoing actions, such as chemical oxidation of VOCs in groundwater, the report should document system start-up (as opposed to completion) and should present initial results on system effectiveness (e.g. capture zone or area of influence). Proposals for further system expansion or modification may be included in annual reports (see Self-Monitoring Program).

6. **IMPLEMENTATION OF PERMEABLE REACTIVE BARRIER**

COMPLIANCE DATE: *September 28, 2008*

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified for installation of the Permeable Reactive Barrier in Task 3. The report should present initial data for performance monitoring. Proposals for further system expansion or modification may be included in annual reports (see Self-Monitoring Program).

7. **PROPOSED INSTITUTIONAL CONSTRAINTS**

COMPLIANCE DATE: *March 31, 2007*

Submit a technical report acceptable to the Executive Officer documenting procedures to be used by the Responsible Parties to prevent or minimize human exposure to soil and groundwater contamination prior to meeting cleanup standards. Such procedures shall include the following:

a. Soil Management Plan for Arsenic in Soil (on-Site) to prevent exposure by construction workers to elevated concentrations of arsenic during subsurface construction activities.
b. Deed restriction that notifies future Site owners of sub-surface contamination, prohibits the use of shallow groundwater beneath the Site

as a source of drinking water until cleanup standards are met, and prohibits sensitive uses of the Site such as residences and daycare centers.

c. Vapor Intrusion Prevention Systems to prevent exposure to elevated concentrations of VOCs in residential indoor air in homes above the off-Site downgradient groundwater plume area.

d. Private Well Removal to reduce the potential risks posed by use of VOC-impacted groundwater for landscape/garden irrigation and filling swimming pools.

e. New Well Restrictions to ensure that current and future landowners are not permitted to install water supply wells until the final groundwater cleanup goals are achieved.

8. IMPLEMENTATION OF INSTITUTIONAL CONSTRAINTS

COMPLIANCE DATE: *60 days after Executive Officer approval*

Submit a technical report acceptable to the Executive Officer documenting that the proposed institutional constraints described in Task 7 have been implemented. In the event a homeowner refuses access, the report shall document the Responsible Parties' attempt to gain access.

9. STATUS REPORT ON REMEDY EFFECTIVENESS

COMPLIANCE DATE: *December 31, 2009,*
December 31, 2012,
and every 5 years afterward

Submit a technical report acceptable to the Executive Officer evaluating the effectiveness of the approved remedial action plan. The report should include:

a. Summary of effectiveness in controlling contaminant migration and protecting human health and the environment
b. Comparison of contaminant concentration trends with cleanup standards
c. Comparison of anticipated versus actual costs of cleanup activities
d. Performance data (e.g. groundwater volume treated, chemical mass removed, mass removed per million gallons treated)
e. Cost effectiveness data (e.g. cost per pound of contaminant removed)
f. Summary of additional investigations (including results) and significant modifications to remediation systems
g. Additional remedial actions proposed to meet cleanup standards (if applicable) including time schedule

If cleanup standards have not been met and are not projected to be met within a reasonable time, the report should assess the technical practicability of meeting cleanup standards and may propose an alternative cleanup strategy.

10. ALTERNATIVE CLEANUP PLAN

COMPLIANCE DATE: *90 days after requested by Executive Officer*

If the Executive Officer concludes that the selected remedy is not working or needs major modification, and the Task 9 status report does not arrive at the same conclusion, submit a technical report acceptable to the Executive Officer consisting of a workplan to implement an alternative cleanup strategy.

11. PROPOSED CURTAILMENT

COMPLIANCE DATE: *60 days prior to proposed curtailment*

Submit a technical report acceptable to the Executive Officer containing a proposal to curtail remediation. Curtailment includes system closure (e.g. well abandonment), system suspension (e.g. cease injection but wells retained), and significant system modification (e.g. major reduction in injection rates, closure of individual injection wells within injection network). The report should include the rationale for curtailment. Proposals for final closure should demonstrate that cleanup standards have been met, contaminant concentrations are stable, and contaminant migration potential is minimal.

12. IMPLEMENTATION OF CURTAILMENT

COMPLIANCE DATE: *60 days after Executive Officer approval*

Submit a technical report acceptable to the Executive Officer documenting completion of the tasks identified in Task 11.

13. EVALUATION OF NEW HEALTH CRITERIA

COMPLIANCE DATE: *90 days after requested by Executive Officer*

Submit a technical report acceptable to the Executive Officer evaluating the effect on the approved remedial action plan of revising one or more cleanup standards in

response to revision of drinking water standards, maximum contaminant levels, or other health-based criteria.

14. **EVALUATION OF NEW TECHNICAL INFORMATION**

COMPLIANCE DATE: *90 days after requested by Executive Officer*

Submit a technical report acceptable to the Executive Officer evaluating new technical information which bears on the approved remedial action plan and cleanup standards for this site. In the case of a new cleanup technology, the report should evaluate the technology using the same criteria used in the feasibility study. Such technical reports shall not be requested unless the Executive Officer determines that the new information is reasonably likely to warrant a revision in the approved remedial action plan or cleanup standards.

15. **Delayed Compliance**: If the Responsible Parties are delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the Responsible Parties shall promptly notify the Executive Officer and the Board may consider revision to this Order.

D. **PROVISIONS**

1. **No Nuisance**: The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050(m).

2. **Good O&M**: The Responsible Parties shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.

3. **Cost Recovery**: The Responsible Parties shall be liable, pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the Responsible Parties over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.

4. **Access to Site and Records**: In accordance with California Water Code Section 13267(c), the Responsible Parties shall permit the Board or its authorized representative:

   a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

   b. Access to copy any records required to be kept under the requirements of this Order.

   c. Inspection of any monitoring or remediation facilities installed in response to this Order.

   d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the Responsible Parties.

5. **Self-Monitoring Program**: The Responsible Parties shall comply with the Self-Monitoring Program as attached to this Order and as may be amended by the Executive Officer.

6. **Contractor / Consultant Qualifications**: All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.

7. **Lab Qualifications**: All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Board review. This provision does not apply to analyses that can only reasonably be performed on-site (e.g. temperature).

8. **Document Distribution**: Copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the following agencies and individuals:

   a. City of Pleasant Hill
   b. City of Concord
   c. Contra Costa County Health Services Department
      i. Hazardous Materials Division
      ii. Public Health Division

iii. Environmental Health Division
d. Colony Park Neighbors Association; c/o Lucy Goodell
e. Mount Diablo Unified School District
f. Contra Costa County Central Library; Attn: Carol Yuke

The Executive Officer may modify this distribution list as needed.

9. **Reporting of Changed Owner or Operator**: The Responsible Parties shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.

10. **Reporting of Hazardous Substance Release**: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the Responsible Parties shall report such discharge to the Board by calling (510) 622-2369 during regular office hours (Monday through Friday, 8:00 to 5:00).

A written report shall be filed with the Board within five working days. The report shall describe the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the Office of Emergency Services required pursuant to the Health and Safety Code.

11. **Rescission of Existing Order**: This Order supercedes and rescinds Orders No. R2-2003-0035 and R2-2004-0081.

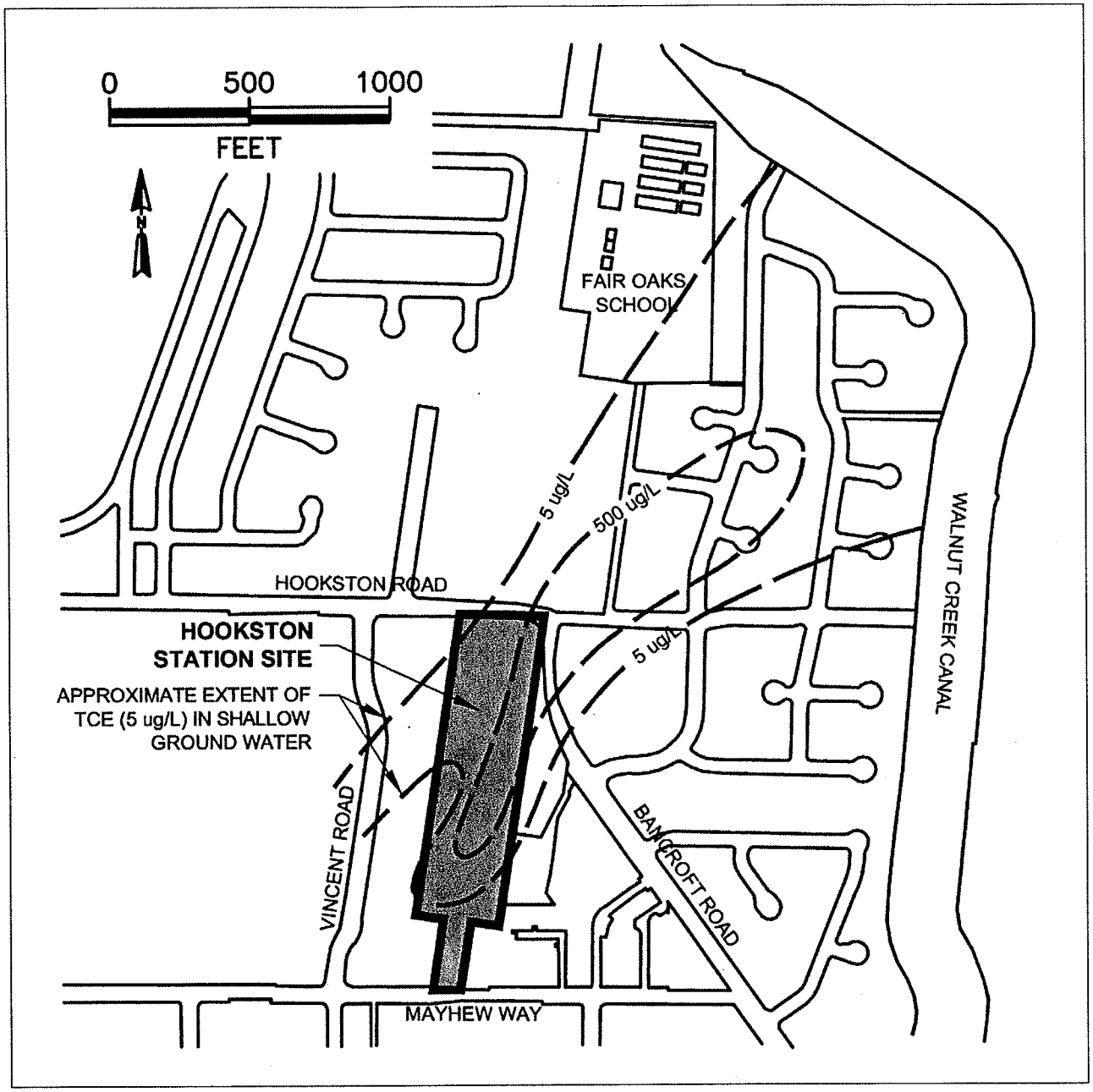
12. **Periodic SCR Review**: The Board will review this Order periodically and may revise it when necessary.

I, Bruce H. Wolfe, 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, San Francisco Bay Region, on January 23, 2007.

Bruce H. Wolfe
Executive Officer

FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS ORDER MAY SUBJECT YOU TO ENFORCEMENT ACTION, INCLUDING BUT NOT LIMITED TO: IMPOSITION OF ADMINISTRATIVE CIVIL LIABILITY UNDER WATER CODE SECTIONS 13268 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY

Attachments: Site Location Map
Self-Monitoring Program



Site Location Map, showing extent of shallow groundwater plume. Based on groundwater monitoring data from 4th quarter 2005.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

UNION PACIFIC RAILROAD COMPANY
DANIEL C. and MARY LOU HELIX, ELIZABETH YOUNG, JOHN V. HOOK, NANCY ELLICOCK, STEVEN PUCELL,
AND CONTRA COSTA COUNTY REDEVELOPMENT AGENCY

for the property referred to as:

HOOKSTON STATION

and located at
228 HOOKSTON ROAD
PLEASANT HILL, CONTRA COSTA COUNTY

1. **Authority and Purpose**: The Board requires the technical reports required in this Self-Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Board Order No. R2-2007-0009 (final site cleanup requirements).

2. **Groundwater Monitoring**: The Responsible Parties shall measure groundwater elevations semi-annually in all monitoring wells, and shall collect and analyze representative samples of groundwater according to the following table:

Well No.	Sampling Frequency	Remarks
MW-01	Semi-Annual	"A-Zone"
MW-03	Semi-Annual	"A-Zone"
MW-04	Semi-Annual	"A-Zone"
MW-05	Semi-Annual	"A-Zone"
MW-06	Annual	"A-Zone"
MW-07	Semi-Annual	"A-Zone"
MW-08A	Semi-Annual	"A-Zone"
MW-11A	Semi-Annual	"A-Zone"
MW-12A	Semi-Annual	"A-Zone"
MW-13A	Semi-Annual	"A-Zone"
MW-14A	Semi-Annual	"A-Zone"
MW-15A	Semi-Annual	"A-Zone"
MW-16A	Semi-Annual	"A-Zone"

MW-17A	Semi-Annual	"A-Zone"
MW-18A	Annual	"A-Zone"
MW-19A	Annual	"A-Zone"
MW-23A	Semi-Annual	"A-Zone"
MW-24A	Semi-Annual	"A-Zone"
MW-25A	Semi-Annual	"A-Zone"
MW-01D/ MW-08B	Semi-Annual	"B-Zone"
MW-02D/ MW-09B	Annual	"B-Zone"
MW-03D/ MW-10B	Semi-Annual	"B-Zone"
MW-11B	Semi-Annual	"B-Zone"
MW-12B	Semi-Annual	"B-Zone"
MW-13B	Semi-Annual	"B-Zone"
MW-14B	Semi-Annual	"B-Zone"
MW-15B	Semi-Annual	"B-Zone"
MW-16B	Semi-Annual	"B-Zone"
MW-17B	Semi-Annual	"B-Zone"
MW-18B	Semi-Annual	"B-Zone"
MW-19B	Semi-Annual	"B-Zone"
MW-23B	Semi-Annual	"B-Zone"
MW-24B	Semi-Annual	"B-Zone"
MW-25B	Semi-Annual	"B-Zone"
MW-26B	Annual	"B-Zone"
MW-15C	Annual	"C-Zone"
MW-19C	Annual	"C-Zone"
MW-23C	Annual	"C-Zone"

Groundwater samples shall be collected during the rainy and dry seasons (approximately first and third quarters) each year. All samples shall be analyzed using EPA Method 8260B or equivalent.

The Responsible Parties shall sample any new monitoring or extraction wells quarterly for at least four quarters and analyze groundwater samples for the same constituents as shown in the above table. The Responsible Parties may propose changes in the above table; any proposed changes are subject to Executive Officer approval. Additionally, the monitoring program described above may be modified for performance monitoring purposes when remedial actions are implemented.

3. **Soil vapor monitoring:** Permanent soil vapor probes shall be monitored periodically as described in the following table to document trends in vapor concentrations near residences for the express purpose of evaluating the soil vapor intrusion pathway for

chemicals originating from the Hookston Station Site. The soil vapor sampling activities shall be implemented in accordance with the *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air – Interim Final* (DTSC, February 2005). Reporting limits shall be equal to or less than Environmental Screening Levels for shallow soil gas in a residential land use setting.

Probe No.	Sampling Frequency	Remarks
SVP-1	Quarterly	Vadose Zone
SVP-2	Quarterly	Vadose Zone
SVP-3	Quarterly	Vadose Zone
SVP-4	Quarterly	Vadose Zone
SVP-5	Quarterly	Vadose Zone
SVP-6	Quarterly	Vadose Zone
SVP-7	Annual	Vadose Zone, utility corridor
SVP-8	Annual	Vadose Zone, utility corridor
SVP-9	Annual	Vadose Zone, utility corridor
SVP-10	Annual	Vadose Zone, utility corridor
Additional locations		See Finding 7 and Task 2

All samples shall be analyzed using EPA method TO-15 or equivalent

The Responsible Parties shall sample any new monitoring probes quarterly and analyze soil vapor samples for the same constituents as shown in the above table. The Responsible Parties may propose changes in the above table; any proposed changes are subject to Executive Officer approval.

4. **Indoor air monitoring:** Indoor air sampling and analysis shall be completed in accordance with the *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (DTSC, February 2005). The sampling program shall include the following:
   - Samples shall be analyzed using method TO-15 SIM, which includes the chemicals that originate from the Hookston Station Site. Method TO-15 SIM also includes PCE, which does not originate from the Hookston Station Site;
   - Samples shall be collected from the first floors of all homes and from the second floors of two-story homes;
   - At least two sampling events shall include the collection and analysis of crawl-space air samples for homes with crawl spaces. Crawl-space air samples are not required for homes with installed vapor intrusion prevention systems and homes for which two sampling events have already included crawl-spaces.

- Samples shall be collected over a 24-hour period using calibrated flow controllers;
- Outdoor air temperature shall be recorded at the beginning and end of the sampling period; Weather Service information regarding local temperatures may also be reported;
- Residents shall be asked, but not required, to keep windows and doors closed in the room containing the sampling device for the duration of the sampling;
- Ambient air samples shall be collected during each sampling day;
- Petroleum-related compounds, which do not originate from the Hookston Station Site, may be excluded from data tables in monitoring reports, but shall be included in the laboratory reports.

Indoor air sampling and analysis shall be completed annually for all single family residences indicated on **Figure 1** for which access is provided for indoor air sampling. These homes are generally located above the 500 micrograms per liter (µg/l) TCE groundwater iso-concentration contour in the A-Zone (based on historical data). Indoor air monitoring shall be conducted during the summer dry season, and no later than August 31. The Responsible Parties shall assist Water Board staff to send letters requesting access. The Responsible Parties shall meet with Water Board staff annually to discuss potential adjustments to the sampling area boundaries and sampling frequencies based upon the data collected during the previous year.

5. **Vapor Intrusion Prevention System Monitoring**: All houses with installed vapor intrusion prevention systems shall be visually inspected (and repaired, if needed) annually to ensure that the mechanical equipment is in good condition and operating properly and that the crawl space vapor barrier remains intact.

6. **Quarterly Monitoring Reports**: The Responsible Parties shall submit quarterly monitoring reports to the Board no later than 30 days following the end of the quarter (e.g. report for first quarter of the year due April 30). The first quarterly monitoring report shall be due on *April 30, 2007*.

The reports shall include:

a. Transmittal Letter: The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the Responsible Parties' principal executive officer or his/her duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.

b. Groundwater Elevations: Groundwater elevation data shall be presented in the first and third quarter reports for the year. Data shall be presented in tabular form, and a groundwater elevation map shall be prepared for each monitored water-bearing zone. Historical groundwater elevations shall be included in the fourth quarterly report each year.

c. Groundwater Analyses: Groundwater sampling data shall be presented in the first and third quarter reports for the year. Data shall be presented in tabular form, and an iso-concentration map should be prepared for one or more key contaminants for the A-Zone and B-Zone. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical groundwater sampling results shall be included in the fourth quarterly report each year. The report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping - below).

d. Soil Vapor Analyses: Soil vapor sampling data shall be presented in each quarterly report; results for vapor probes sampled on an annual basis shall be included in the report for the fourth quarter each year. Data shall be presented in tabular form, and an iso-concentration map should be prepared for one or more key contaminants. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical soil vapor sampling results shall be included in the fourth quarterly report each year. The report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping - below).

e. Groundwater Extraction: If applicable, the report shall include groundwater extraction results in tabular form, for each extraction well and for the site as a whole, expressed in gallons per minute and total groundwater volume for the quarter. The report shall also include contaminant removal results, from groundwater extraction wells and from other remediation systems (e.g. soil vapor extraction), expressed in units of chemical mass per day and mass for the quarter. Historical mass removal results shall be included in the fourth quarterly report each year.

f. Indoor Air Analyses: The results for the annual indoor air sampling events shall be presented in the report for the fourth quarter each year. Indoor air sampling data shall be presented in tabular form and a map prepared for one or more key contaminants, as appropriate. The report shall indicate the analytical method

used, detection limits obtained for each reported constituent, and a summary of QA/QC data. The report shall describe any significant changes in contaminant concentrations since the last report, and any measures proposed to address any increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping – below).

g. Visual Monitoring of Vapor Intrusion Prevention Systems: Results of visual monitoring of vapor intrusion prevention systems shall be included in the report for the fourth quarter each year. Any deficiencies and measures taken to correct those deficiencies shall also be described.

h. Status Report: The quarterly report shall describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures, institutional controls implementation) and work planned for the following quarter.

7. **GeoTracker Reporting**: Pursuant to Title 23, Division 3, Chapter 30, Articles 1 and 2, Sections 3890-3895 of the California Code of Regulations, the following information shall be submitted electronically to the State Board's GeoTracker database:
   a. All chemical analytical results for soil, water, and vapor samples;
   b. The latitude and longitude of any permanent sampling point for which data is reported, accurate to within 1 meter and referenced to a minimum of two reference points from the California Spatial Reference System, if available;
   c. The surveyed elevation relative to a geodetic datum of any permanent sampling point;
   d. The elevation of groundwater in any permanent monitoring well relative to the surveyed elevation;
   e. A site map or maps showing the location of all sampling points;
   f. The depth of the screened interval and the length of screened interval for any permanent monitoring well;
   g. PDF copies of boring logs;
   h. PDF copies of all reports, workplans, and other documents, including the signed transmittal letter and professional certification by a California Licensed Civil Engineer or a Registered Geologist.

   Additionally, hard copies of all documents and data submittals (except for NPDES general permit reports, which may be submitted exclusively as electronic documents) shall be submitted to the Water Board.

8. **Violation Reports**: If the Responsible Parties violate requirements in the Site Cleanup Requirements, then the s shall notify the Board office by telephone as soon as practicable once the Responsible Parties have knowledge of the violation. Board staff may,

depending on violation severity, require the Responsible Parties to submit a separate technical report on the violation within five working days of telephone notification.

9. **Other Reports**: The Responsible Parties shall notify the Board in writing prior to any site activities, such as removal or installation of any subsurface facilities, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.

10. **Record Keeping**: The Responsible Parties or their agent(s) shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the Board upon request.

11. **SMP Revisions**: Revisions to the Self-Monitoring Program may be ordered by the Executive Officer, either on his/her own initiative or at the request of the Responsible Parties. Prior to making SMP revisions, the Executive Officer will consider the burden, including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.

I, Bruce H. Wolfe, Executive Officer, hereby certify that this Self-Monitoring Program was adopted by the Board on January 23, 2007.

Bruce H. Wolfe
Executive Officer

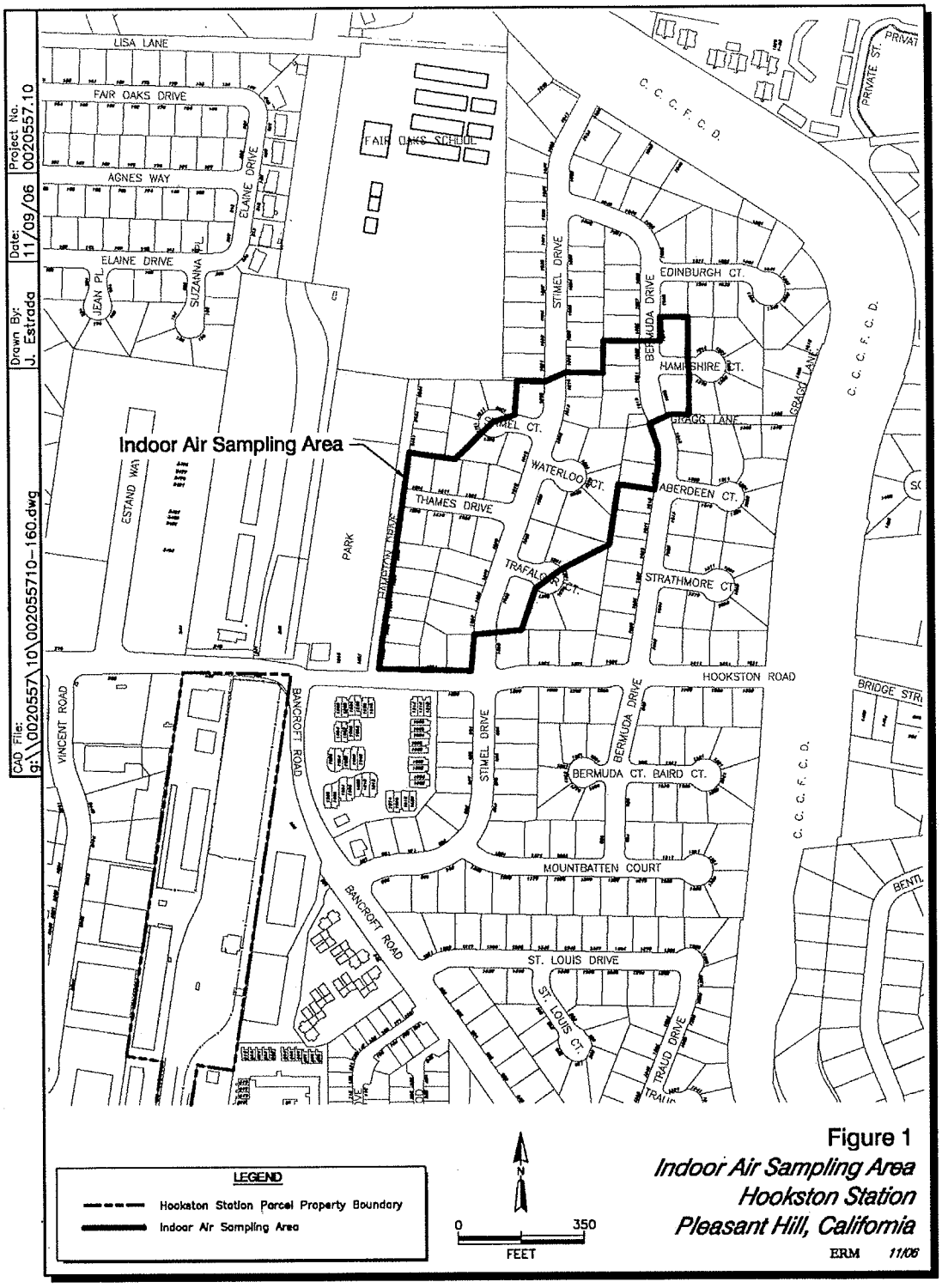


Figure 1
Indoor Air Sampling Area
Hookston Station
Pleasant Hill, California
ERM 11/06