California Regional Water Quality Control Board
San Francisco Bay Region

Linda S. Adams
Secretary for
Environmental Protection

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
http://www.waterboards.ca.gov/sanfranciscobay

Arnold Schwarzenegger
Governor

CERTIFIED MAIL NO. 7001 2510 0009 2092 4121
RETURNED RECEIPT REQUESTED

Date: SEP 12 2008
File No. 01S0038 (ccm)

SHH. L.L.C.
Peter Schneider (pds5000@aol.com
5627 Starfish Court
Discovery Bay, CA 94514

SUBJECT: Transmittal of a Certified Copy of Final Site Cleanup Requirements Order No. R2-2008-0081 for 37445 Willow Street, Newark, Alameda County

Dear Mr. Schneider:

Enclosed please find a certified copy of Order No. R2-2008-0081 adopted by the Board on September 10, 2008. You may also download this Order from our web page at (http://www.swrcb.ca.gov/sanfranciscobay/board_decisions/adopted_orders/order_nos.shtml).

If you have any questions, please contact Cherie McCaulou of my staff at 510-622-2342 or e-mail at cmccaulou@waterboards.ca.gov.

Sincerely,

Bruce H. Wolfe
Executive Officer

Enclosure

Mailing List

Cal-EPA DTSC – RCRA Facility Assessments
700 Heinz Avenue, Building F, Suite 200
Berkeley, CA 94710
Attn: Wei-Wei Chui (wchui@dtsc.ca.gov)

Alameda County Water District
Groundwater Resource Division
43885 South Grimmer Boulevard
Fremont, CA 94537
Attn: Steven Inn (steven.inn@acwd.com

City of Newark Fire Department
371010 Newark Boulevard
Newark, CA 94560-3796
Attn: Holly Guier (holly.guier@newark.org)

City of Newark Planning Division
371010 Newark Boulevard
Newark, CA 94560-3796
Attn: John Becker (john.becker@newark.org)
Terrence Grindall (terrence.grindall@newark.org)

Newark Library
6300 Civic Terrace Avenue
Newark, CA 94560
Attn: Kathy Steel-Sabo
(aclibrary.org/mailtostaff.asp)

Gallade Chemical, Inc.
8333 Enterprise Drive
Newark, CA 94560
Attn: Tony Senior
(tony_senior@galladechem.com)

Trumark Commercial
4185 Blackhawk Plaza Circle
Danville, CA 94506
Attn: Ron Winter (rwinter@trumark-co.com)

ProLogis Trust
4545 Airport Way
Denver, CO 80239
Attn: Scott Strine (sstrine@prologis.com)

Sam Trans/PCJPB
1250 San Carlos Avenue
P.O. Box 3006
San Carlos, CA 94070-1306
Attn: Hubert Chan (chanh@samtrans.com)

FMC Corporation
1735 Market Street
Philadelphia, PA 19103
Attn: Shawn Tollin
(shawn.tollin@fmc.com)

Ashland, Inc.
P.O. Box 2219
Columbus, OH 43216
Attn: Mark Metcalf
(mmetcalf@ashland.com)

Jones-Hamilton Company
30354 Tracy Road
Walbridge, OH 43465-9792
Attn: Ray Hahn rhahn@jones-hamilton.com)

Honeywell Intenational Inc.
2525 West 190th Street (MS:23-3-62)
Torrence, CA 90504
Attn: Benny DeHghi
(benny.dehghi@honeywell.com)

CH2M Hill – Oakland (BAO)
155 Grand Avenue, Suite 1000
Oakland, CA 94612
Attn: Terry Feng (terry.feng@ch2m.com)

Cargill Inc.
7220 Central Avenue
Newark, CA 94560
Attn: Penny A. Streff (penny_streff@cargill.com)

Torian Property c/o GVA Kidder Mathews
203 Redwood Shores Parkway, Suite 530
Redwood City, CA 94065
Attn: John Olenchalk (johno@gvakm.com)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. R2-2008-0081

FINAL SITE CLEANUP REQUIREMENTS AND RESCISSION OF ORDER NO. 98-094 FOR:

SHH, L.L.C.

for the property located at

37445 WILLOW STREET
NEWARK, ALAMEDA COUNTY

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

1. **Site Location**: The SHH, L.L.C. property (the "Site") is a flat, triangular 6-acre parcel located at 37445 Willow Street, Newark. The Site lies west of Interstate 880, south of Highway 84 and the Dumbarton Bridge, and east of the salt evaporation ponds on the east margin of San Francisco Bay (Figure 1). Land use in the vicinity of the Site has been largely industrial/commercial. The Site is surrounded by similar chemical processing/manufacturing facilities that have impacted soil and groundwater and are also under Water Board cleanup orders (Figure 1). A description of the adjacent properties is presented in Finding 7. Nearest surface water bodies are the Newark Slough, approximately 1,000 feet to the north, and Plummer Creek, approximately 1,500 feet to the southwest of the Site. The Site is within the City of Newark's Specific Plan Area Two (Dumbarton Rail Corridor Project). Residential developments are located within 700 to 1000 feet northeast of the Site.

2. **Site History**: Prior to 1975, the Site was used for agricultural purposes. From 1975 to 1987, the Site was a chemical manufacturing, packaging and distribution facility, owned and operated by Frank Peckett under the name Foster Chemical Corporation (Foster). The Site was used to store, custom blend and formulate a variety of organic and inorganic chemicals including: aliphatic napthas, aromatic solvents, alcohols, thinners, chlorinated solvents, esters, ethanols, fluorinated solvents, glycols, glycol ethers, ketones, bases, acids, resins, and specialty products. The Site also accepted hazardous wastes from offsite generators. Chemicals were transported by tank trucks and rail cars along two railroad spurs that parallel the eastern and northwestern property boundaries of the Site, connected to rails at adjoining properties. An aboveground tank farm and drum processing area was located west of the existing 6,000 square-foot warehouse. Two truck scales were located in the southeast portion of the Site.

During a September 1981 site inspection by Board staff, Foster was requested to take actions to eliminate the discharge of all pollutants that came in contact with the ground surface. Foster was required to place spill pans underneath rail cars, to place hoses inside the tank farm wall, to redrum leaking drums and remove, haul and dispose of contaminated soil at a Class 1 dump. An industrial waste runoff occurred along Willow Street on January 5, 1982, and VOCs were detected in the grab water sample collected from the street. Groundwater contamination underlying the Site was first discovered in September 1982 during an offsite investigation by Ashland Chemical (Finding 7, Adjacent Sites) to define the extent of contamination from a leaking underground storage tank located on its adjacent site. Volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were detected in the soil and Shallow Zone groundwater, and these chemicals were used and handled by both Foster and Ashland.

In 1985, Mr. Peckett was convicted of unlawful storage and disposal of hazardous wastes, pursuant to the California Health and Safety Code. In December 1987, Romic Chemical Corporation (Romic) purchased the Site out of bankruptcy with the intent to operate a rail transfer facility. Romic was unable to obtain an operating permit. Consequently, the Site was vacant for many years. In February 1999, the Site was purchased by SHH, L.L.C., the current property owner, who took over the environmental liability for the cleanup of the Site. Currently, the Site consists of unpaved vacant land used to store large piles of reclaimed asphalt; concrete and gravel used to manufacture base-rock for construction projects; and empty tractor trailers, old motorcycles, and laboratory ventilation hoods.

Currently, the City of Newark is considering converting land use in Area Two from Special Industrial to Residential and Mixed-use for redevelopment of a transit-oriented community nearby the Dumbarton Rail Corridor Project. In March 2008, the City Council adopted a new Concept Plan for the Area 2 Specific Plan that would initiate special studies (i.e., environmental impact report) to evaluate the feasibility of this concept.

3. **Named Discharger**: SHH, L.L.C. is named as a discharger because it is the current owner of the Site on which there is an ongoing discharge of pollutants, it has knowledge of the discharge or the activities that caused the discharge, and it has the legal ability to control the discharge.

   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' names to this order.

4. **Regulatory Status:** The Site has been subject to the following Board orders:

   a. Site Cleanup Requirements Order No. 89-111, adopted June 21, 1989; and
   b. Site Cleanup Requirements Order No. 98-094, adopted September 16, 1998.

5. **Site Hydrogeology**: The Site is located within the Niles Cone groundwater sub-basin. This sub-basin consists of a series of flat-lying aquifers separated by extensive clay

aquitards. The Newark Aquitard, the uppermost mapped unit of this sub-basin, covers nearly all of the sub-basin and consists of clay and silt with discrete sand units. The Newark Aquitard is further underlain by three aquifers: the Newark Aquifer, Centerville Aquifer, and Fremont Aquifer. The deepest water-bearing units, referred to collectively as the Deep Aquifers, are present at approximately 400 and 500 feet below grade surface (bgs) and possibly deeper, and are separated from the overlying Fremont Aquifer by a competent regional aquitard. The Newark Aquifer is the uppermost aquifer within the sub-basin, with depths ranging from approximately 40 to 140 feet bgs. Within the Site area, the Newark Aquifer consists of sands, silty sands, and lenses of gravel.

The Site is underlain by fill material from ground surface to approximately 3 feet bgs. Generally, clayey silt is present from 3 to 10 feet bgs; saturated silty sand of relatively high-permeability from 10 to 23 feet bgs; greenish-grey silty clay of the Newark Aquitard from 23 to 40 feet bgs; and saturated sand, silty sand, and silt of the Newark Aquifer from 40 to 70 feet bgs.

The Shallow Zone groundwater underlying the Site has been encountered at depths of approximately 3 to 12 feet bgs. The Shallow Zone hydraulic gradient is variable and flat and has been influenced by a number of factors, including mounds of gravel on the Site, groundwater extraction systems that operated onsite and on nearby properties, and the engineered cap at Jones-Hamilton east of the Site. The depth to water varies seasonally; the lowest water levels are reported in early fall (e.g., October). The Newark Aquifer flows to the southwest under semi-confined to confined conditions. The piezometric surface of the Newark Aquifer is typically slightly higher than the piezometric surface of the Shallow Zone groundwater. This vertical hydraulic gradient between the Shallow Zone groundwater and the Newark Aquifer varies seasonally. A downward gradient occurs during the rainy season and an upward groundwater gradient occurs during the remainder of the year.

Both the Shallow Zone groundwater and the Newark Aquifer groundwater are brackish to saline with high total dissolved solids (TDS) concentrations due to saltwater intrusion from the San Francisco Bay. In the Board's Basin Plan, (Finding 13.b.), the Niles Cone groundwater sub-basin is currently listed as having existing beneficial uses for groundwater. Extraction from a series of Newark Aquifer wells more than two miles from the Site began in 2003 as part of the Alameda County Water District (ACWD) Desalination Project. An additional phase of groundwater extraction is scheduled to begin in 2010 (ACWD, 2008).

6. **Remedial Investigation**: Investigations by Romic between 1987 and 1992 detected volatile organic compounds (VOC) and other chemicals in soil and Shallow Zone groundwater underlying the Site. Chemicals found as a results of the investigations include: acetone, ethylbenzene, toluene, xylenes, methylene chloride, 2-butanone, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE), 2-hexanone, and 4-methyl-2-pentanone. Based on concentration and persistent occurrence, the compound 1,2-DCA or ethylene

dichloride is considered the primary chemical of concern at the Site. Ethylene dichloride was manufactured at the Site. An offsite source of pentachlorophenol (PCP) and tetrachlorophenol (TCP) from the adjacent Jones-Hamilton site has impacted Shallow Zone groundwater underlying the SHH Site and the adjacent Torian site.

- **Soil**: The lateral and vertical extent of soil contamination at the Site has been assessed by drilling and sampling soil from 33 boring locations, 4 excavation pits, and conducting a soil gas survey utilizing 18 sample locations. A November 1992 investigation utilizing 13 soil borings found soil contamination hot spots at locations EB-6, EB-10, BH-3, BH-8, BH-14, BH-18, B-16, and B-22. Maximum VOC concentrations detected in soil samples include: 1,2-DCA up to 7,400 milligram per kilogram (mg/kg), TCE and xylenes up to 2,500 mg/kg, MIBK up to 3,400 mg/kg, PCE up to 1,000 mg/kg, acetone up to 560 mg/kg, and DCE and TCA up to 70 mg/kg (Harza, 1994).

  Soil hot spot removal occurred in 1993 (Finding 8). Remaining VOC-impacted soil that exceeds 1 mg/kg is known to exist in at least two areas of the Site: (1) in the southeast corner near the EB-6 excavation area; and (2) in the central portion near the B-16, B-22, BH-14 excavation areas. Because there has been no soil sampling conducted since 1993, additional soil sampling is warranted to determine existing site conditions, especially onsite near the former rail lines and truck scales and along Willow Street.

- **Shallow Zone Groundwater:** Since 1982, VOCs have consistently been detected in the Shallow Zone groundwater at the SHH and neighboring sites (Ashland, FMC, and Jones-Hamilton). In the past, SHH and neighboring sites have participated in a joint semi-annual monitoring program to monitor VOCs, and area-wide plume maps are generated using 1,2-DCA data from nearly 70 wells. The current onsite monitoring well network includes seven Shallow Zone monitoring wells (B-14, B-17, B-18, B-19, SW-1, SW-2, and EX-1), as shown in Figure 2. Groundwater samples are analyzed for VOCs semi-annually. Well B-18 (a replacement well for B-15, abandoned by Ashland in 1987) located in the southeastern portion of the Site continues to have the highest VOC concentrations. As of January 2007, the concentration of 1,2-DCA in well B-18 was 1,400 µg/L, a significant decrease from its historical high in October 1990 of 59,200 µg/L.

  Elevated concentrations of PCP and TCP were also detected onsite between 1995 and 2002, due to offsite migration from the adjacent Jones-Hamilton site. PCP, up to 410 µg/L, and TCP, up to 250 µg/L, were detected at the southeast corner of the Site in well SW-1, and in two offsite wells J-7 and J-14 located south of the Site at the adjacent Torian site. Well J-14 was destroyed by Jones-Hamilton in May 2006, and well J-7 is monitored and sampled semi-annually.

  The Shallow Zone groundwater underlying the Site and in the vicinity contains high chloride and TDS at concentrations exceeding 3,000 micrograms/liter (µg/L).

Although this shallow groundwater is not currently used, it overlies the important Newark Aquifer that is used for drinking water.

- **Newark Aquifer:** The Newark Aquifer is has been monitored collectively by SHH and neighboring sites (Ashland, FMC, Jones-Hamilton) using 11 monitoring wells, including a single well (NW-1), located at the center of the SHH Site, and screened from 59 to 69 feet bgs. VOCs have not been detected in the well NW-1, based on 43 sampling events over 17 years, except for a one-time detection of 1,2-DCA at a concentration of 0.5 µg/L in July 1999, and a detection of trichlorofluoromethane at a concentration of 130 micrograms per kilogram (µg/mg) reported in a soil sample at a depth of 44 feet bgs. However, VOCs have been detected in adjacent Newark Aquifer wells at the Ashland, FMC, and Jones-Hamilton sites, at the nearby Honeywell (former Baron-Blakeslee) site, and in former ACWD wells E-56, E-57 and E-58. There are no Newark Aquifer wells installed south of the Site. To assure that the VOC hot spots in the southeastern portion of the Site are monitored adequately, an additional Newark Aquifer well is needed in the vicinity of existing well B-18, and former boring EB-6 and well B-15. Additionally, all existing Newark Aquifer wells in the vicinity of the Site need to be included in the semi-annual joint monitoring program.

  Newark Aquifer groundwater underlying the Site and in the vicinity contains high chloride and TDS at concentrations exceeding 3,000 µg/L. Although the Newark Aquifer underlying the Site is not currently used for drinking water, the groundwater within 3 miles of the site is used to supplement drinking water and is an important part of ACWD's groundwater management program, as described in Finding 12.

- **Newark Aquitard:** The competency of the Newark Aquitard as an effective barrier to the downward migration of solvent-impacted groundwater within the Site vicinity remains questionable. Concentrations of VOCs and SVOCs have been detected in wells screened in the Newark Aquifer, including wells owned by ACWD, Ashland, FMC, Jones-Hamilton and Honeywell. A hydraulic connection between the Shallow Zone groundwater and the Newark Aquifer has been reported from earlier investigations in the Site vicinity.

- **Contaminant Fate and Transport Mechanisms:** Chemicals released in the Shallow Zone groundwater at and in the vicinity of the Site have co-mingled due to several factors, including: (1) a fluctuating shallow water table with variable flow directions, (2) a nearly flat hydraulic gradient, (3) seasonal upward and downward vertical gradients from the Newark Aquifer, (4) historic groundwater pumping in the area, (5) the close proximity of sites to one another, and (6) man-made and natural conduits.

  Examination of aerial photos and maps shows that numerous stream channels were present in the vicinity of the Site in the past, which is typical of the estuarine environment, and a possible historic channel exists between Ashland and Foster Chemical companies (Wahler, 1988). Additionally, local faulting in the vicinity may have affected the fate and transport of chemicals at the Site. Cross sections indicate a

pinching out of the Shallow Zone groundwater between wells B-16 and B-17 and a thinning aquitard from 40 feet in onsite well NW-1 to less than 15 feet in offsite well D-1, along with an abrupt 25-foot offset at the base of the Newark Aquitard between well NW-1 onsite and D-2 offsite. This offset suggests the presence of a fault in the vicinity of the Site.

A study of potential conduits in 1989 by Wahler Associates for Ashland stated, "large sand lenses that may occur within the Newark Aquitard and the Aquitard itself are possible natural vertical conduits, and that deep ACWD wells extending from the Shallow Zone to the Newark Aquifer represent artificial vertical conduits." All deep ACWD wells in the area have since been destroyed. Hydraulic testing performed at the Jones-Hamilton site estimated upward leakage (flux) through the Newark Aquitard to be approximately 130 gallons per day (gpd), under pumping conditions within the Shallow Zone of 580 gpd (Emcon, 1990). Likewise, when the Newark Aquifer is pumped, there will be downward flux through the aquitard.

7. **Adjacent Sites:** There are four other chemical manufacturing facilities adjacent and nearby the Site that have also polluted soil and groundwater with chemicals similar to those used by SHH, and are conducting groundwater cleanup under Water Board orders. A fifth property, a former brick manufacturing facility under local agency oversight by ACWD, is located immediately south of the Site.

   - Ashland Chemical at 8610 Enterprise Drive lies adjacent to the western boundary of the Site. Final Site Cleanup Requirements for the Ashland site were adopted in 2005, with soil excavation and monitored natural attenuation as the final remedial action. The groundwater extraction and treatment system that operated for approximately 23 years has been turned off and is scheduled to be removed.

   - FMC Corporation at 8787 Enterprise Drive lies northwest of the Site. Final Site Cleanup Requirements for the FMC site were adopted in May 2002, with dual-phase extraction as the final remedial action. FMC discontinued operation of the dual-phase system after three months of repeated system failures. FMC currently pumps groundwater from 17 extraction wells in the Shallow Zone and two extraction wells in the Newark Aquifer.

   - Jones-Hamilton Company at 8400 Enterprise Drive lies to the east of the Site, across Willow Street. Final Site Cleanup Requirements for the Jones-Hamilton site were adopted in May 2001, with source encapsulation and monitored natural attenuation as the final remedial action. The groundwater extraction and treatment system that operated for 16 years has been removed.

   - Honeywell International, Inc. (formerly Baron Blakeslee/Allied Signal) at 8333 Enterprise Drive lies to the northeast of the Site. Final Site Cleanup Requirements for the site were adopted in January 2007, with thermal vapor extraction, in-situ chemical oxidation and excavation as the final remedial action. Gallade Chemical

Company currently operates this facility as a chemical distribution center; however, no raw products are handled at the facility.

- Torian Property (formerly Katchaturian) at 37555 Willow Street lies immediately south of the Site, and is currently under local agency oversight by ACWD for residual metals associated with historic brick manufacturing.

The contaminant plumes of the FMC, Ashland, SHH and Jones-Hamilton sites in the Shallow Zone have commingled to some extent. Migration control of the Shallow Zone contaminant plumes was achieved by independent groundwater extraction systems, which have now been shut down. Currently, FMC is the only site pumping groundwater from both the Shallow Zone and the Newark Aquifer in the vicinity.

8. **Interim Remedial Measures**: Romic began implementing interim remedial measures (IRMs) at the Site in May 1990 with the installation and operation of a shallow groundwater extraction and treatment system. The system extracted groundwater from wells B-16 and B-22 located in the center of the Site. Extracted groundwater was pumped into holding tanks and transported offsite to Romic's East Palo Alto facility for processing/disposal. In April 1991, the extracted groundwater was treated onsite with activated granular carbon and discharged directly into the sanitary sewer. In 1993, the system was temporarily shut down for source removal activities. Soil exceeding 1 milligram per kilogram (mg/kg) of VOCs was excavated to depths of 7 to 10 feet bgs in four excavation areas (Excavation EB-10, Excavation BH-8, Excavation EB-6 and Excavation B-16, B-22, BH-14). Over 2,500 cubic yards of excavated soil was treated by onsite aeration and reused as backfill once the VOC concentrations fell below laboratory method reporting limits. During excavation dewatering, 30,000 gallons of VOC-impacted groundwater was removed and treated onsite for disposal into the sanitary sewer.

   In February 1994, a new groundwater extraction system began operating at a rate of 3 gallons per minute using extraction well EX-1 and extraction trench ET-1. Between 1990 and 2003, nearly 15,000,000 gallons of VOC-impacted groundwater was removed and treated from extraction wells, an extraction trench, and through dewatering during excavation. In November 2003, Water Board staff granted approval for a temporary 6-month shut down of the groundwater extraction and treatment system to assess non-pumping conditions and plume stability and hydraulic control, based on additional groundwater data. System operation has never resumed, however, and subsequent enforcement actions were taken.

9. **Environmental Risk Assessment**: The discharger submitted two risk assessment documents, the most recent of which is the September 24, 2002, *Risk Assessment Evaluation and Contingency Plan.* This revised site-specific (Tier II) risk assessment concluded that residual chemical constituents in soil, groundwater and soil gas at the Site do not pose a significant threat to human health or the environment, assuming a future commercial development scenario. In a Board staff letter dated November 5, 2003, the risk assessment was rejected for a variety of reasons, including failure to (1) present an adequate site conceptual model, (2) provide equations and input parameter values for all

models used in the risk assessment, (3) provide a summary table of all data used in the 95% UCL calculations, (4) assume groundwater is a potential source of drinking water, (5) include soil screening levels that are protective of potential leaching and subsequent impacts to shallow groundwater, and (6) provide data for soils used to assess indoor air impacts. The letter requested that a revised risk assessment be submitted. No subsequent site-specific risk assessment has been conducted. No soil gas data has been collected to directly assess the risk of vapor intrusion to indoor air.

The Board considers the following risks to be acceptable at remediation sites: a cumulative hazard index (HI) of 1.0 or less for non-carcinogens, and for carcinogens a cumulative excess cancer risk of 10^{-6} or less.

Due to excessive risk that will be present at the Site pending full remediation, institutional constraints are appropriate to limit on-site exposure to acceptable levels. Institutional constraints include a deed restriction that notifies future owners of sub-surface contamination, prohibits the use of shallow groundwater beneath the Site as a source of drinking water, and prohibits residential uses of the Site until cleanup standards are met.

10. **Feasibility Study**: Multiple Feasibility Study/Remedial Action Plans (FS/RAPs) have been submitted for the Site, dating back to 2000 and 2002. The latest report, *Feasibility Study/Remedial Action Plan,* was submitted in July 2007, and revised in March 2008. It incorporated the findings from in-situ remediation pilot tests, as follows:

- The reports, *Preliminary Pilot Study Status Report*, (September 28, 2006), and *2006 First Semi-annual Groundwater Monitoring and Pilot Study Status Update* (August 3, 2006), present the results of the enhanced bioremediation pilot test performed in April 2006. Hydrogen releasing compounds (HRCs) were injected into borings drilled in the immediate vicinity of wells (B-14, B-18, and B-19) having the highest VOCs concentrations. The study was concluded after three months, and post injection monitoring data indicated that the HRC applications were unsuccessful in achieving dechlorination and reducing VOC concentrations in the test wells.

- The report, *Secondary Pilot Study Status* (May 31, 2007), presents the results of the chemical oxidation pilot test performed between April and May 2007, with RegenOx injected into borings drilled in the immediate vicinity of wells B-14 and B-18. Post-injection monitoring data indicated a temporary reduction in VOC concentrations, suggesting that RegenOx was effective but limited by its high rate of reactivity. For this reason, a less reactive chemical oxidizer such as activated persulfate was recommended for the full-sale application at the Site, under the March 2008 Feasibility Study/Remedial Action Plan. Based on these preliminary pilot tests, in-situ chemical oxidation (ISCO) technology is proposed as the preferred final remedial alternative for groundwater, followed by long-term MNA to achieve cleanup standards.

Based on the results of pilot testing, the latest FS/RAP considered three remedial options: (1) groundwater extraction and treatment, (2) in-situ enhanced bioremediation, and (3) in-situ chemical oxidation using a less reactive reagent. Groundwater extraction was successfully implemented as an interim remedial action for 10 years at the Site, but is no longer cost effective. Enhanced bioremediation was pilot-tested for one year and found to be ineffective. Chemical oxidation has the most potential for rapidly destroying VOCs, based on pilot testing. The remedial strategy for the Site assumes the following:

a. Groundwater at the Site is the only medium that warrants further remediation.
b. Shallow groundwater beneath the Site is neither a current nor potential drinking water source.
c. The Site will be completely developed for either residential use, commercial use, or both.
d. The nearest surface water bodies are approximately 2,000 feet away from the Site.
e. The nearest potentially active water production well is approximately 1,500 feet upgradient from the Site.
f. Subsurface soils at the Site are predominantly characterized by silts, clays, and silty-sands.

The Board does not agree with items a. and b. above.

11. **Remedial Action Plan**: Multiple Remedial Action Plans (RAPs) have been submitted for the Site. The latest RAP, titled *Revised Feasibility Study/Remedial Action Plan* (March 28, 2008), proposes in-situ chemical oxidation for remediation of VOCs in Shallow Zone groundwater by injection of an FMC-proprietary activated persulfate product into the subsurface. The persulfate oxidizer will be activated by a sodium hydroxide reagent injected with the persulfate oxidizer. This proprietary solution has not been pilot-tested at the Site; however, pilot-testing is currently being conducted at the nearby Honeywell site. The RAP states that site-specific cleanup standards for soil will be developed at a later date, using physical soil parameters collected during the next phase of investigation (pre-remediation investigation). In the interim, SHH proposes preliminary cleanup goals pursuant to Board Order No. 98-094: for soil, 1 mg/kg of total VOCs, 10 mg/kg total semi volatile organics compounds (SVOCs), and background concentrations for metals; for groundwater, drinking water standards or MCLs (State of California maximum contaminant levels). The Board does not accept these proposed soil standards, however the proposed groundwater cleanup standards are acceptable.

The RAP states that initially a pilot test will be conducted in the vicinity of existing wells B-14 and B-18. The FMC Reagent will be injected using a direct-push method at four locations around each well, followed by groundwater monitoring of wells B-14 and B-18 at 15-day intervals for 45 days. If the test indicates that ISCO is a viable remediation alternative for the Site, SHH will proceed during the second quarter of 2009 when water levels are the highest with the following tasks:

- Soil sampling at 9 locations (8 borings drilled to 5 feet bgs, and 1 boring drilled to a depth of 75 feet bgs into the Newark Aquitard), to collect physical and chemical data necessary to finalize cleanup goals for the Site;
- Conducting a membrane interface probe (MIP) survey at 25 locations to delineate the lateral and vertical extent of the impacted areas with sufficient detail to optimize the placement of the proposed chemical oxidizer injection locations;
- Installing four new shallow wells to augment monitoring data from the existing seven shallow wells; and
- Implementing a full-scale ISCO remediation using FMC's activated oxidizer reagent injected into the subsurface at locations spaced laterally on 20-foot centers, and vertically on 5-foot centers, as identified by the MIP survey, followed by two years of quarterly groundwater monitoring and sampling to assess remediation progress. After the first year of monitoring, additional ISCO injections may be conducted to augment the remediation.

Figure 16 of the RAP shows the proposed locations for the 8 shallow borings, 25 MIP borings, and the 4 Shallow Zone groundwater monitoring wells; however, the proposed location for the deep Newark Aquifer boring is not shown.

The RAP proposes ISCO pilot testing followed by additional soil and groundwater investigations, development of site-specific cleanup standards, and full-scale remediation. This Order requires the data gap and pre-remediation investigations be conducted prior to pilot testing in order to obtain important information on site conditions that will aid in optimizing pilot testing results. This Order also sets soil and groundwater cleanup standards, since site-specific alternate cleanup standards have not been approved. Revised cleanup standards are addressed under Task 12, Evaluation of New Health Criteria.

If migration of constituents from nearby properties onto the SHH Site is confirmed by the monitoring program, then the Water Board may direct adjacent property owners to pursue cleanup operations to eliminate impacts to the SHH Site.

12. **Groundwater Management:** ACWD currently has three primary sources of water supply: (1) the State Water Project (SWP), (2) the San Francisco Public Utilities Commission (SFPUC), and (3) local runoff from the Alameda Creek watershed. Local runoff and SWP water received for groundwater recharge are percolated into the Niles Cone Groundwater Basin through recharge in Alameda Creek itself and through recharge ponds within the Quarry Lakes Regional Recreational Area and adjacent areas. This percolated water is subsequently recovered through groundwater production wells and provided as potable supply to ACWD's customers. ACWD provides potable water to a population of over 327,000 in the Cities of Fremont, Newark, and Union City. The ACWD-managed groundwater basin includes the following physiographic units identified by the State Department of Water Resources: the Niles Cone Groundwater Basin and its affiliates Dry Creek Cone, Mission Alluvial Apron, Mission Upland, Warm Springs Alluvial Apron, and the portion of the Bay Plain situated between the Niles Cone and San Francisco Bay.

The groundwater basin is effectively divided into two general sub-basins by the Hayward Fault, which acts as a lateral barrier to groundwater flow. In the "Above Hayward Fault (AHF)" Sub-basin on the eastern side of the Hayward Fault, a single aquifer extends from ground surface to bedrock, without significant intervening aquitards. In the "Below Hayward Fault" (BHF) sub-basin on the western side of the Hayward Fault, there are four regional aquifers separated by intervening aquitards. By order of depth, these aquifers are the Newark Aquifer, Centerville Aquifer, Fremont Aquifer and Deep Aquifer. The Centerville and Fremont aquifers are commonly conceptualized as a single unit, referred to as the Centerville-Fremont Aquifer.

The water quality in the AHF sub-basin is characterized by fresh groundwater. In the Newark Aquifer, groundwater is fresh in the eastern part of the BHF sub-basin, and transitions into brackish groundwater in the western portion. Brackish groundwater also exists in the deeper aquifer layers over various areas within the sub-basin. The brackish groundwater is a result of seawater intrusion from the adjacent San Francisco Bay due to historical pumping practices. Since the 1960's, ACWD has managed the groundwater basin to prevent any additional seawater intrusion.

Potable water production occurs at the Mowry and Peralta-Tyson Wellfields. In 1974, the District initiated its Aquifer Reclamation Program (ARP) to restore water quality in the groundwater basin by removing the saline water trapped in the aquifer system. Nine wells are utilized for reclamation pumping: three in the Newark Aquifer, five in the Centerville-Fremont Aquifer, and one in the Deep Aquifer. Historically, these wells were used to pump brackish water to San Francisco Bay via flood control channels. Approximately 9,900 acre-feet was pumped from all ARP wells during fiscal year 2006-2007. Since November 2003, much of the water pumped from the ARP wells is treated at the Newark Desalination Facility for potable use by ACWD's customers (served by the distribution system). This facility treats up to 5 million gallons per day utilizing reverse osmosis to remove salts and other impurities from the brackish groundwater. Production from the facility is expected to double to 10 MGD by 2010 with two additional Centerville-Fremont wells serving as brackish groundwater sources.

The quality of groundwater in the basin is improved as recharge water replaces the pumped brackish groundwater. ARP pumping also prevents the plume of brackish water in the Centerville-Fremont and Deep Aquifers from further migrating toward the Mowry Wellfield. Five other wells that were Salinity Barrier Project (SBP; described below) wells are now considered part of the Aquifer Reclamation Program.

Currently, the SHH Site (the Site) is situated between the locations of two former SBP wells.[1] SBP Well C is located approximately 4,500 feet northwest of the Site, and SBP Well B is located approximately 1.3 miles east of the Site. ACWD has completed a one-year pilot test of its pumping facility at SBP Well B and SBP Well A, located

[1] ACWD uses the word "Site" in the naming convention of its SBP wells, such as 'Site A'. To avoid confusion with the SHH, LLC site, the word 'Site' is hereinafter avoided in reference to the SBP wells.

approximately 1.8 miles southeast of the Site, and both wells are ideally positioned to be operated as ARP wells. Full operation of one or more of the SBP wells could begin anytime when the piezometric levels in the Newark Aquifer are high enough that brackish water could be pumped out of the basin, as indicated by ACWD's modeling efforts.

In the current mode of operation, the ACWD ARP wells do not affect water levels or the groundwater gradient at the Site. However, operation of the SBP wells or installation of new production wells in the vicinity of the Site could affect the groundwater gradient at the Site. It is possible that groundwater extraction at ACWD facilities in the vicinity of the Site could lower the piezometric surface in the Newark Aquifer, causing a downward hydraulic gradient from the Shallow Zone groundwater. This change could accelerate the migration of VOCs in shallow groundwater, both laterally and vertically. If significant VOC concentrations migrate to the SBP wells, then ACWD may be required to treat groundwater pumped from SBP wells prior to discharging it to surface waters or using it for beneficial use.

Because ACWD plans relative to the SBP wells are currently being developed, assessment of risk to the SBP wells is not warranted at this time. A risk evaluation will be needed as soon as ACWD decides to proceed with operation of SBP Well A, B, or C, or any future ACWD water well screened in the Newark Aquifer and located less than 2 miles from the Site. SHH must not wait for commencement of operation but must initiate the risk evaluation as soon as ACWD decides to operate one or more of the wells noted above. In evaluating this risk, SHH will need to consider all chemicals of concern at the Site that could interfere with the ACWD's ability to use (e.g., as a supply to the Newark Desalination Facility) or dispose of the extracted groundwater, as applicable.

13. **Basis for Cleanup Standards**

a. **General:** State Water 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. The previously-cited cleanup plan confirms the Board's initial conclusion that background levels of water quality cannot be restored. This Order and its requirements are consistent with Resolution No. 68-16.

State Water 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.

Potential impact to human health due to exposure to contaminants in soil and groundwater has been the primary concern for the Site and has therefore been considered in selecting soil and groundwater cleanup standards, in addition to protection of groundwater resources.

b. **Beneficial Uses:** The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Board and approved by the State Water Board, U.S. EPA, and the Office of Administrative Law where required.

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
- Freshwater replenishment to surface waters

The existing and potential beneficial uses of the Plummer Creek, a tidal tributary of South San Francisco Bay, include:

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

The stormwater retention basin located to the north of the Site collects stormwater runoff from the Prologis property. The existing or potential beneficial uses of this basin include groundwater recharge and wildlife habitat.

c. **Basis for Groundwater Cleanup Standards**: In the absence of acceptable site-specific alternate cleanup standards, the cleanup standards for the Shallow Zone groundwater and Newark Aquifer underlying the Site are based on applicable water quality objectives, which are the State of California maximum contaminant levels (MCLs) or federal MCLs for contaminants with no California MCL. The most stringent drinking water standard is used for chemicals with multiple drinking water

standards (i.e., Primary MCL, Secondary MCL, California MCL, Federal MCL, etc.). Cleanup to this level will result in acceptable risk to human health and aquatic habitats. The discharger proposed MCLs as interim cleanup standards for groundwater in the March 28, 2008, Feasibility Study and Remedial Action Plan, pending development of site-specific alternate cleanup standards.

d. **Basis for Soil Cleanup Standards:** In the absence of acceptable site-specific alternate cleanup standards, the cleanup standards for soil are based on the Tier 1 environmental screening levels or ESLs, for shallow soil where groundwater is a potential source of drinking water under commercial/ industrial land use scenarios (Water Board, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, November 2007). Soil cleanup standards for the Site are intended to address both potential human health impact from direct contact pathways and potential leaching of chemicals from the unsaturated zone and subsequent impact on groundwater. For the purposes of this order, the unsaturated zone is defined as the zone above the water table's lowest historical or seasonal levels, as documented or anticipated. The discharger proposed 1 mg/kg total VOCs as interim soil cleanup standards, pending development of site-specific alternate cleanup standards.

e. **Basis for Soil Gas Cleanup Standards:** In the absence of soil gas data, the cleanup standards for soil gas are also based on the Tier 1 ESLs. Soil gas cleanup standards for the Site are intended to address potential human health impact from vapor intrusion.

14. **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 discharger 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 obtained from pilot studies or full-scale remediation at the Site indicates that remediation action levels or cleanup standards can be surpassed, the Board may decide that further cleanup actions should be taken.

15. **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.

16. **Basis for 13304 Order:** California Water Code Section 13304 authorizes the Board to issue orders requiring a discharger to cleanup and abate waste where the discharger 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.

17. **Cost Recovery:** Pursuant to California Water Code Section 13304, the discharger is 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.

18. **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.

19. **Notification:** The Board has notified the discharger 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.

20. **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 discharger (or its agents, successors, or assigns) shall clean up 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 that will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. CLEANUP PLAN, CLEANUP STANDARDS, AND REMEDIATION ACTION LEVELS

1. **Implement Cleanup Plan:** The discharger shall implement the cleanup plan described in Finding 11.

2. **Soil and Groundwater Cleanup Standards:** The soil and soil gas cleanup standards shown below shall be met throughout the unsaturated zone at the Site. For the purposes of this Order, the unsaturated zone is defined as the zone above

the water table's lowest historical or seasonal levels, as documented or anticipated. The cleanup levels shall be confirmed with confirmatory soil samples prior to curtailment of the Remedial Action Plan described in Finding 11. The groundwater cleanup standards shown below shall be met in all wells identified in the Self-Monitoring Program.

Chemical of Concern	Groundwater Cleanup Standard (µg/L)	Soil Cleanup Standard (mg/kg)	Soil Gas Cleanup Standard (µg/m^3)
Acetone	6,300	0.5	1,800,000
1,1-dichloroethane	5.0	0.20	5,100
1,2-dichloroethane	0.5	0.0045	310
1,1-dichloroethene	6.0	1.0	120,000
cis-1,2-dichloroethene	6.0	0.19	20,000
1,1,1-trichloroethane	200	7.8	1,300,000
Tetrachloroethene	5.0	0.7	1,400
Trichloroethene	5.0	0.46	4,100
Benzene	1.0	.044	280
Toluene	150	2.9	180,000
Ethylbenzene	300	3.3	3,300
Xylenes, total	1,800	2.3	58,000
Methylene chloride	5.0	0.077	17,000
Trans-1,2-dichloroethene	10	0.67	41,000
1,1,2-trichloroethane	5.0	0.07	510
Vinyl Chloride	0.5	0.047	100

C. TASKS

1. PROPOSED INSTITUTIONAL CONSTRAINTS

COMPLIANCE DATE: February 1, 2009

Submit a technical report acceptable to the Executive Officer documenting procedures to be used by the discharger, and future owners and associated occupants of the Site, to prevent or minimize human exposure to soil and groundwater contamination prior to meeting cleanup standards, and after meeting cleanup standards, if cleanup will not attain unrestricted use levels. Such procedures shall include a deed restriction prohibiting the excavation of soils, and prohibiting the use of Shallow Zone groundwater and Newark Aquifer groundwater as a source of drinking water, and prohibiting residential uses. A risk management plan (RMP) for the Site is needed to mitigate risks associated with residual chemicals in soil and groundwater during current conditions, future development, and completion of final remedial actions. The RMP shall include a site-specific health and safety plan to address exposure to chemicals in soil and, specifically, dust control, dewatering, equipment decontamination, surface runoff, and excavation, loading, and transport of any contaminated soil and water.

2. **IMPLEMENTATION OF INSTITUTIONAL CONSTRAINTS**

COMPLIANCE DATE: 120 days after Executive Officer approval of Task 1

Submit a technical report acceptable to the Executive Officer documenting that the proposed institutional constraints have been implemented.

3. **DATA GAP AND PRE-REMEDIATION INVESTIGATION WORKPLAN**

COMPLIANCE DATE: February 1, 2009

Submit a workplan acceptable to the Executive Officer to fill the remaining data gaps resulting from changes in site conditions, the need to define source(s), and the vertical and lateral extent of soil and groundwater pollution in the Shallow Zone and Newark Aquifer. Implementation of the proposed scope of work should lead to the completion of a revised site conceptual model and additional data needed to optimize remediation using the proposed in-situ chemical oxidation (ISCO) technology. The workplan should specify investigation methods, and shall include the following:

a. Identify remaining suspected source(s);
b. Define the vertical and lateral extent of soil and groundwater pollution, and fate and transport of site chemicals;
c. Install Newark Aquifer well(s), if appropriate, based on the results of the data gap investigations. Monitor for the presence of site chemicals and define the extent if necessary;
d. Assess tidal fluctuations and determine groundwater flow/hydraulic gradient for Shallow Zone and Newark Aquifer;
e. Collect and analyze soil gas samples to evaluate indoor air vapor intrusion;
f. Assess the competency of the confining layers and potential for lateral and vertical plume(s) migration due to pumping operations of ACWD; and
g. Specify investigation methods and a proposed time schedule.

4. **COMPLETION OF DATA GAP AND PRE-REMEDIATION INVESTIGATION AND WORKPLAN FOR ADDITIONAL MONITORING WELLS AND ISCO PILOT TEST**

COMPLIANCE DATE: September 1, 2009

Submit a technical report acceptable to the Executive Officer presenting the results of the data gap and pre-remediation investigation and documenting completion of necessary tasks identified in the Task 3 workplan. The technical report should evaluate potential risks to indoor air, identify source(s) of pollution, and define the vertical and lateral extent of pollution down to concentrations at or below the specified cleanup standards for soil and groundwater in the Shallow Zone and the Newark Aquifer. The completion report should also present a workplan for installation of additional monitoring wells,

including a Newark Aquifer well (if needed based on new data), in the southeast corner of the Site, and performance of an ISCO pilot test. The workplan shall specify investigation methods and a proposed time schedule.

5. **COMPLETION OF IN SITU CHEMICAL OXIDATION PILOT TEST AND WORKPLAN FOR FULL-SCALE REMEDIATION TO CLEAN UP SHALLOW GROUNDWATER**

COMPLIANCE DATE: May 1, 2010

Submit a technical report acceptable to the Executive Officer presenting the results of the ISCO pilot test for plume treatment and documenting completion of necessary tasks identified in the Task 4. The report shall include a workplan for full-scale remediation of the Shallow Zone groundwater at the Site.

6. **IMPLEMENTATION AND ASSESSMENT OF FINAL REMEDIAL MEASURES**

COMPLIANCE DATE: December 15, 2011

Submit a technical report acceptable to the Executive Officer documenting completion of the implemented steps identified in the Task 5 workplan, including: the results of the full-scale remediation of the Shallow Zone groundwater at the Site, any modifications to the approved full-scale remediation plan, and an assessment on the effectiveness of the remediation action to meet the soil and groundwater cleanup standards. At a minimum, the report shall (1) evaluate the effectiveness of the implemented in-situ chemical oxidation following two years of active remediation, and (2) propose supplemental action, if required, to meet the cleanup standards.

7. **FIVE-YEAR STATUS REPORT**

COMPLIANCE DATE: September 15, 2014, and every five years thereafter

Submit a technical report acceptable to the Executive Officer evaluating the effectiveness of the approved cleanup 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 the corresponding remediation action levels and cleanup standards.
c. Comparison of anticipated versus actual costs of cleanup activities.
d. Performance data (e.g., groundwater volume extracted, chemical mass removed, mass removed per million gallons extracted).
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 the corresponding remediation action levels and 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.

8. **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 extraction but wells retained), and significant system modification (e.g., major reduction in extraction rates, closure of individual extraction wells within extraction network, etc.). The report should include the rationale for curtailment. Proposals for final closure should demonstrate that remediation action levels and cleanup standards have been met, contaminant concentrations are stable, and contaminant migration potential is minimal. If a request for curtailment is made prior to achieving all remedial action goals, the curtailment report must justify why further cleanup is not economically and technically feasible with the currently adopted remedial alternative.

9. **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 the Task 8 workplan.

10. **WORKPLAN FOR ALTERNATE CLEANUP PLAN (CONTINGENCY PLAN)**

COMPLIANCE DATE: 90 Days after requested by Executive Officer

Submit a workplan acceptable to the Executive Officer for implementation of an alternate cleanup plan in the event that the remedial activities specified in Task 6 do not achieve cleanup standards.

11. **IMPLEMENTATION OF ALTERNATIVE CLEANUP METHOD**

COMPLIANCE DATE: 180 Days after Executive Officer approval

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified in the Task 10 workplan.

12. EVALUATION OF NEW HEALTH CRITERIA

COMPLIANCE DATE: 90 days after request by Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating the effect on the approved cleanup plan of revising one or more cleanup standards in response to revision of drinking water standards, maximum contaminant levels, or other health-based criteria.

13. EVALUATION OF NEW TECHNICAL INFORMATION

COMPLIANCE DATE: 90 days after request by Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating new technical information that bears on the approved cleanup plan and cleanup standards for the 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 cleanup plan or cleanup standards.

14. REVISED RISK ASSESSMENT

COMPLIANCE DATE: 90 days after request by Executive Officer

Submit a revised risk assessment acceptable to the Executive Officer in the event that ACWD decides to proceed with operation of any water well screened in the Newark Aquifer and located less than two miles from the SHH Site, including but not limited to SBP wells A, B, or C, as detailed in Finding 12, Groundwater Management.

15. DELAYED COMPLIANCE

If the discharger is delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the discharger shall promptly notify the Executive Officer, and the Water 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 Operation and Maintenance**: The discharger 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 discharger shall be liable, pursuant to California Water Code Section 13304, to the Water Board for all reasonable costs actually incurred by the Water 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 Water 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 discharger 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 discharger shall permit the Water 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 that is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

5. **Self-Monitoring Program**: The discharger 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 Water Board using approved U.S. EPA methods and appropriate laboratory detection limits for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Water 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:

    a. City of Newark Fire Department (Hazardous Materials Division)
    b. Alameda County Water District (Groundwater Resources Division)
    c. Department of Toxic Substances Control (Corrective Action Branch)
    [The Executive Officer may modify this distribution list as needed]

9. **Reporting of Changed Owner or Operator**: The discharger 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 discharger shall report such discharge to the Water Board by calling (510) 622-2300 during regular office hours (Monday through Friday, 8:00 to 5:00). A written report shall be filed with the Water 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 supersedes and rescinds Site Cleanup Requirements Order 98-094.

12. **Periodic SCR Review**: The Water 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 September 10, 2008.

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: Self-Monitoring Program
Site Plan (Figure 1)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

SHH, L.L.C.

for the property located at

37445 WILLOW STREET
NEWARK, ALAMEDA COUNTY

1. **Authority and Purpose**: The Water Board requests 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 Water Board Order No. R2-2008-0081 (Site Cleanup Requirements).

2. **Monitoring**: The discharger shall measure groundwater elevations semi-annually in all monitoring wells, and shall collect and analyze representative groundwater samples according to the Table on the following page.

   The discharger shall sample any new monitoring or extraction wells semi-annually thereafter and analyze groundwater samples for the same constituents as shown in the following table. The discharger may propose changes in the table; any proposed changes are subject to Executive Officer approval.

3. **Semi-Annual Monitoring Reports**: The discharger shall submit semi-annual monitoring reports to the Water Board no later than 30 days following the end of the semi-annual period (e.g., report for July through December period due January 31, and January through June period due July 31). The first semi-annual monitoring report shall be due on January 31, 2009. The reports shall include:

   - 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 discharger's 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.

   - Groundwater Elevations: Groundwater elevation data will be collected semiannually and shall be presented in tabular form, and a groundwater elevation map should be prepared for each monitored water-bearing zone. Historical groundwater elevations shall be included in the second semi-annual report each year.

   - Groundwater Analyses: Laboratory analytical methods shall use low detection limits (less than or equal to cleanup standards), unless sample dilution is necessary.

Groundwater sampling data shall be presented in tabular form, and an isoconcentration map should be prepared for one or more key contaminants for each monitored water-bearing zone, as appropriate. 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 second semi-annual 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).

Well No.	Water Bearing Zone	Sampling Frequency	Analyses by EPA Method	Comments
B-14	Shallow	Semiannual	VOCs by 8260B; SVOCs by 8270	Existing well
B-17	Shallow	Semiannual	VOCs by 8260B; SVOCs by 8270	Existing well
B-18	Shallow	Semiannual	VOCs by 8260B; SVOCs by 8270	Existing well
B-19	Shallow	Semiannual	VOCs by 8260B	Existing well
EX-1	Shallow	Semiannual	VOCs by 8260B	Existing well
SW-1	Shallow	Semiannual	VOCs by 8260B; SVOCs by 8270	Existing well
SW-2	Shallow	Semiannual	VOCs by 8260B; SVOCs by 8270	Existing well
RAP-1	Shallow	Semiannual	VOCs by 8260B	New Well Proposed
RAP-2	Shallow	Semiannual	VOCs by 8260B	New Well Proposed
RAP-3	Shallow	Semiannual	VOCs by 8260B	New Well Proposed
RAP-4	Shallow	Semiannual	VOCs by 8260B	New Well Proposed
NW-1	Newark	Semiannual	VOCs by 8260B	Existing well
NW-2	Newark	Semiannual	VOCs by 8260B	Required per Order "See Tasks 1 and 2 of the Order"

Notes:

Field Analyses: All samples will be analyzed in the field for pH, dissolved oxygen (DO), electrical conductance (EC), temperature, oxidation-reduction potential (ORP), and turbidity.

MNA Monitoring: All wells specified for monitored natural attenuation (MNA) analysis will also be analyzed annually for the following parameters:

Ferrous iron, manganese, carbon dioxide, and sulfide by Hach DR/850
Nitrate-nitrite by EPA Method 353.2
Sulfate by EPA Method 300.0
Alkalinity by EPA Method 310.1
Total dissolved solids by EPA Method 160.1
Total organic carbon by EPA Method 415.1
Methane, ethane, and ethene by RSK SOP 175
Field measurement of pH, dissolved oxygen (DO), electrical conductance (EC), temperature, oxidation-reduction potential (ORP), and turbidity for all wells as part of the low-flow sampling.

4. **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 period. 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 period. Historical mass removal results shall be included in the annual report.

5. **Status Report**: The semi-annual report shall describe relevant work completed during the reporting period (e.g., site investigation, interim remedial measures) and work planned for the following period.

6. **Violation Reports**: If the discharger violates requirements in the Site Cleanup Requirements, the discharger shall notify the Water Board office by telephone as soon as practicable once the discharger has knowledge of the violation. Water Board staff may, depending on violation severity, require the discharger to submit a separate technical report on the violation within five working days of telephone notification.

7. **Other Reports**: The discharger shall notify the Water Board in writing prior to any site activities, such as construction or underground tank removal, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.

8. **Record Keeping**: The discharger or his/her agent 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 Water Board upon request.

9. **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 discharger. 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.

ENVIRO forensics *ENVIRONMENTAL FORENSIC INVESTIGATIONS, INC* 4234 Hacienda Drive, Suite 250 ◦ Pleasanton, CA 94588 ENVIROFORENSICS.COM	Date: 7/3/07 Designed ML Checked SH DWG File 14275-07	SITE AND SURROUNDING PROPERTIES Feasibility Study/Remedial Action Plan 37445 Willow Street Newark, California	Figure 1 Project 198