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

Date: JUL 16 2007
File No.: 43S0223 (MS)

NCH Corporation and Mohawk Laboratories
Attn: Mr. Mike Near [mnear@NCH.com]
2727 Chemsearch Boulevard
Irving, Texas 75062

SUBJECT: Final Site Cleanup Requirements Order No. R2-2007-0047 and Rescission of Order No. 00-106, NCH Corporation and Mohawk Laboratories, 932 Kifer Road, Sunnyvale, Santa Clara County

Dear Mr. Near:

Attached please find Water Board Final Site Cleanup Requirements Order No. R2-2007-0047 for the subject site.

The Water Board adopted Order No. R2-2007-0047 at its monthly public meeting on July 11, 2007. This Order requires Mohawk to implement its final remedial action plan, which includes cleanup and monitoring of contaminated groundwater in onsite and offsite areas. This Order also rescinds Water Board Order No. 00-106 for the subject site.

If you have any questions regarding this letter, please contact Max Shahbazian of my staff at (510) 622-4824, or by e-mail at MShahbazian@waterboards.ca.gov.

Sincerely,

Bruce H. Wolfe
Executive Officer

Attachment: Water Board Order No. R2-2007-0047
cc with attachment: Mailing List (via e-mail)

MAILING LIST
NCH Corporation and Mohawk Laboratories
932 Kifer Road
Sunnyvale, California

George Cook [gcook@valleywater.org]
Nicole Pullman [nicole.pullman@deh.co.santa-clara.ca.us]
Ron Staricha [rstaricha@ci.sunnyvale.ca.us]
Gerri Caruso [gcaruso@ci.sunnyvale.ca.us]

Joe Ferguson [dferguson3@sugar-land.oilfield.slb.com]
Peter Lin [peter.lin@amd.com]
Shau-Luen Barker [shauluen@AOL.com]
Joseph Kwan [joe.kwan@ngc.con]
Kendall Riding [kendall@ridinggroup.com]
Carl Schultz [cbschult@tycoelectronics.com]
Richard Banks [Richard.Banks@nsc.com]
Cynthia Totton [ctotton@spang.com]
Sid McDonald [sidattahoe@aol.com]
Walter Orme [walt.orme@smiths-group.com]

Sofi-Nicloe Froelich [sfroelich@nossaman.com]
Richard Coffin [rcc@bcltlaw.com]
Morgan Gilhuly [rmg@bcltlaw.com]
Edward Sangster [esangster@klng.com]

Pete Fuller [pfuller@thesourcegroup.net]
Scott Morrison [smorrison@thesourcegroup.net]
John Hawthorne [hawthornej@locustec.com]
Joe Muzzio [muzzioj@saic.com]
Vera Nelson [vhnelson@ekiconsult.com]
Pawan Sharma [sharmaPK@CDM.com]
Peter Bennett [pbennett@geomatrix.com]
Joyce Adams [JEA@weiss.com]
Meredith Durant [MeredithDurant@KennedyJenks.com]
Ron Helm [rhelm@cornerstoneearth.com]
Phil Smith [pgsmith@treadwellrollo.com]
Jack Hardin [jahrdin@secor.com]
Nick Walchuk [nwalchuk@Environcorp.com]
Gail Jones [gail@eras.biz]

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. R2-2007-0047

ADOPTION OF FINAL SITE CLEANUP REQUIREMENTS AND RESCISSION OF ORDER NO. 00-106 FOR:

NCH CORPORATION AND MOHAWK LABORATORIES

for the property located at

932 KIFER ROAD
COMMERCIAL STREET OPERABLE UNIT, SUBUNIT 1
SUNNYVALE, SANTA CLARA COUNTY

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

1. **Site Location**: The Mohawk Laboratories ("Mohawk") site is located near the intersection of Commercial Street and Kifer Road in the City of Sunnyvale (Figure 1). The site covers approximately 11 acres, and the regional topography slopes gently toward the north. A warehouse and office building are located on the south and east portions of the site. The north and west portions of the site are unpaved. The surrounding areas are generally commercial and industrial.

2. **Site History**: Mohawk Laboratories is a division of NCH Corporation ("NCH," also known as National Chemsearch). Mohawk and NCH have owned and operated a chemical blending and distribution plant at the site since 1967. An above-ground tank farm with a capacity of 157,000 gallons was located on the site from the mid 1950's to 1988. Chemicals stored in the tank farm included chlorinated solvents, methylene chloride, mineral spirits, kerosene, xylene, and isopropanol. Chemicals stored in the tank farm were transferred into an on-site blending/warehouse building prior to sale and distribution.

3. **Named Dischargers**: Mohawk is named as a discharger because it owns and operates the 932 Kifer Road facility. As a parent company and as co-owner of the site, NCH is also named as a discharger. Releases at the Mohawk site have resulted in soil and groundwater pollution.

   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 Water Board will consider adding that party's name to this order.

4. **Regulatory Status**: This site was subject to Site Cleanup Requirements (SCR) Order No. 00-106, which was adopted on October 18, 2000.

5. **Site Hydrogeology**: Hydrogeological conditions at the Mohawk site are similar to those at other groundwater pollution sites in the area. The area is underlain by unconsolidated sedimentary deposits of clay, silt, sand, and gravel extending to depths of at least 1,000 feet below the ground surface. These deposits have been subdivided into water producing zones (aquifers), and semi-permeable to relatively impermeable saturated zones (aquitards). At the Mohawk site, the shallow groundwater zone (A-Zone) is encountered at approximately 10 feet below ground surface, and extends to approximately 35 feet below the ground surface. The groundwater gradient within the shallow A-Zone slopes in a north-northeasterly direction. The B-Zone is encountered at approximately 45 feet below the ground surface; the thickness of the B-Zone is undetermined. The silt/clay unit separating the A-and B-Zones, an observed upward hydraulic gradient, and VOC concentration data all indicate that hydraulic communication between the A- and B-Zones is relatively low. Groundwater in the B-Zone flows in a north-northeasterly direction.

6. **Remedial Investigation**: Subsurface investigations indicate significant concentrations of organic chemicals in soil and groundwater in the A-Zone beneath the site. Chemicals detected on-site include perchloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethene (DCE), and petroleum hydrocarbons. The most significant pollution is located in the area beneath and immediately downgradient of the former above-ground tank farm. In this area, significant quantities of dissolved solvents and free-phase product, including dense non-aqueous phase liquids (DNAPL) and light non-aqueous phase liquids (LNAPL), have been identified in, and recovered from, the A-Zone aquifer. Elevated levels of dissolved solvents (in concentrations ranging up to 499,000 ppb total VOCs) and significant free-phase product remain on-site, as detected in a May 2006 monitoring event.

   Elevated levels of dissolved solvents and some free-phase product have also been detected (at concentrations ranging up to 134,000 ppb total VOCs in October 2006) in the shallow groundwater aquifer in the offsite area immediately north/northeast of the Mohawk site. Low levels of cis-1,2-DCE (up to10 ppb) have been detected in the B-Zone in isolated areas north of the site up to East Arques Avenue. A plume of dissolved VOCs (predominantly cis-1,2-DCE and TCE), at concentrations exceeding 1,000 ppb total VOCs, has impacted the A-Zone in the area north of East Arques Avenue. A plume of cis-1,2-DCE, at concentrations slightly exceeding its MCL, has impacted the A-Zone north to Duane Avenue. The western extent of the VOC plume is approximately 150 feet west of DeGuigne Drive, and the eastern extent of the plume is approximately halfway between DeGuigne Drive and Santa Trinita Avenue in the 999 East Arques Avenue area.

   The soil and groundwater impacts have been delineated through extensive data collection, analyses and ongoing groundwater sampling. A summary of the remedial investigations conducted at the site was presented in the Expanded Remedial Investigation Report submitted to the Water Board in 2002.

7. **Operable Unit and Subunits**: The Mohawk plume has commingled with a separate VOC groundwater pollution plume originating from the former Fairchild Semiconductor Corporation ("Fairchild") site at 974 East Arques Avenue (referred hereafter as the "Fairchild site"). A groundwater pump and treat system is currently in operation to address the plume down-gradient of the Fairchild site. A basement dewatering and treatment system, and an iron filings wall are also in place at Fairchild site. The Water Board adopted a final Site Cleanup Requirement No. 00-123 for the Fairchild site on November 29, 2000. The order requires continued operation of the groundwater pump and treat system as the final remedial action for the groundwater pollution beneath the Fairchild site. Mohawk is operating and maintaining the groundwater treatment system, sampling and reporting at the Fairchild site, pursuant to an agreement between Mohawk and Fairchild.

   The area including the Mohawk and Fairchild groundwater plumes is referred to as the Commercial Street Operable Unit (CSOU). To facilitate groundwater cleanup, the CSOU was divided into two subunits, with separate SCRs issued for each Subunit in 1997. The configuration of the CSOU and its subunits is shown on Figure 2. Subunit 1 consists of the Mohawk site and the VOC groundwater plume that extends north-northeastward to Stewart Drive (excluding the Fairchild site). Subunit 1 previously extended north-northeastward to East Arques Avenue, but recent investigations demonstrated that groundwater contamination originating from within Subunit 1 extends northward beyond East Arques Avenue. Subunit 2 consists of the Fairchild site, and includes the VOC groundwater plume that originates at that site and the VOC groundwater plume migrating onto the site from Subunit 1.

   Mohawk and NCH, as the only confirmed source of VOC pollution within Subunit 1, are the dischargers named responsible for addressing groundwater pollution in Subunit 1. Mohawk, NCH, Fairchild, and Applied Materials are the dischargers named responsible for addressing pollution in Subunit 2.

   The Water Board recognizes the discharger(s) named to each subunit are largely responsible for the most significant VOC groundwater pollution in the subunit. The dischargers are wholly responsible for addressing significant VOC concentrations in groundwater by meeting the requirements of this Order. As additional information is generated in each subunit, the Water Board may modify the dischargers named in each subunit and/or the boundaries of each subunit.

8. **Other Sites in the Area**: In addition to the Fairchild site, several other confirmed or potential sources of pollution exist in the vicinity of the Mohawk site. These sites include:

   <u>Confirmed Sources of VOC Pollution Northwest of the CSOU (Three Companies Site)</u>

Former TRW Microwave	825 Stewart Drive
Former Philips Semiconductors	811 East Arques Avenue
Former Advanced Micro Devices	901/902 Thompson Place

Confirmed Sources of VOC Pollution East of the CSOU (Stewart Drive Operable Unit)

999 Arques Corporation	999 East Arques Avenue
Sobrato Development Company	968-970 Stewart Drive
CAE Links Electronics	1077 East Arques Avenue

Confirmed Sources of VOC Pollution North of the CSOU

Former Advanced Micro Devices	915 DeGuigne Drive

Confirmed and Potential Sources of VOC Pollution West of the CSOU

Former Pilkington Barnes Hind	895 Kifer Road
Former ICORE International	170-180 N. Wolfe Road
Former Royal Auto Body	150 N. Wolfe Road
Former Magnetics	158 San Lazaro Avenue

Remedial investigations and remedial actions have been and are being performed, to varying degrees of completeness, at all of the above sites.

9. **Interim Remedial Actions**: In 1993, Mohawk installed three horizontal extraction wells in the area of the former tank farm to remediate on-site contaminated soil and groundwater. In 1994, Mohawk installed a vertical groundwater extraction well near the northern site boundary. During eight years of operation, this on-site remediation system removed over 27,000 pounds of organic solvents, including free-phase product (DNAPL and LNAPL), dissolved-phase VOCs, and soil vapor-phase VOCs. The system was shut down in 2001 to complete field pilot testing and subsequent full-scale installation of in-situ remedial systems. In 2002, Mohawk installed an ozone injection system to treat VOC and petroleum hydrocarbons in saturated soil and groundwater on-site. Analytical results indicate that dissolved VOC and total petroleum hydrocarbon (TPH) concentrations in on-site wells have continued to decrease with continued ozone injection. The number and layout of ozone injection points are routinely adjusted as monitoring results indicate the ozone system has been effective at reducing the mass of VOCs and TPH in localized areas on-site. Mohawk installed a soil vapor extraction system in 2001 to treat VOCs and TPH in unsaturated soil on-site. Analytical data indicate that soil vapor concentrations and mass removal rates are generally decreasing over time.

To address off-site contamination in the area immediately north of the Mohawk site and along East Arques Avenue, Mohawk installed re-circulating cell wells as an interim remedial action in 1999. After one year of operation, the re-circulating cell wells had no observable positive affect on groundwater VOC concentrations, and did not appear to be controlling migration of the off-site VOC plume. The re-circulating cell wells were subsequently shut down in 2000. Mohawk initiated a full-scale enhanced anaerobic biodegradation injection program in 2006 for the area immediately north of the Mohawk site. Mohawk will continue to perform effectiveness monitoring to confirm the injection is capable of removing dissolved-phase VOCs.

In 2003, Mohawk installed a permeable reactive barrier (PRB) in the median of the

Central Expressway, near its intersection with Commercial Street, to address migration of dissolved VOCs into the area north of East Arques Avenue. Effectiveness monitoring results, collected over the last three years since PRB construction, indicate the PRB is effectively reducing total VOC concentrations. Mass flux calculations across the length of the PRB indicate that the PRB is achieving between 80 and 90 percent reduction in total VOC concentrations between the upgradient and downgradient wells. In 2007, Mohawk expanded the PRB 50 feet further west to intercept and treat any contaminated groundwater that is flowing around the west edge of the PRB.

10. Risk Assessment: A Tier 3 human health risk assessment (HHRA) was conducted for the Site and offsite areas located north to East Arques Avenue. Based on the nature and extent of contamination in soil, groundwater, soil gas, and indoor air in the HHRA Study Area, this report evaluated the following five separate areas of concern within the HHRA Study Area (Figure 3). The boundaries of these areas of concern are approximate:

- Onsite East
- Onsite West
- Atlas Heater
- Atlas to Central
- Central to Arques

To develop a conceptual understanding of the HHRA Study Area, information regarding potential chemical sources, chemical release and transport mechanisms, locations of potentially exposed human receptors, and potential exposure routes was assessed. The conceptual site model associates the source of chemicals with potentially exposed hypothetical human receptors and associated complete exposure pathways. Based on current and likely potential future uses of the HHRA Study Area, the following hypothetical human receptors were evaluated in the risk assessment:

- Hypothetical Outdoor Commercial/Industrial Worker Receptor;
- Hypothetical Indoor Commercial/Industrial Worker Receptor; and
- Hypothetical Outdoor Construction Worker Receptor.

Because zoning designations prohibit residential use in the HHRA Study Area, a resident receptor was not included in the risk assessment. The HHRA estimated human adverse non-cancer health effects and excess cancer risks from assumed exposure to constituents of concern in the HHRA Study Area, as listed in the following table.

HHRA Study Areas, Exposure Pathways and Health Risks

Area of Concern	Constituents for Which Mitigation May Be Recommended	Exposure Pathway	Risk	Hazard Index
Onsite East	Arsenic in soil	Direct contact (outdoor commercial /industrial worker)	2E-05	0.02
	PCE, TCE and cis-1,2-DCE in groundwater (1)	Inhalation in indoor air (indoor commercial/ industrial worker) (2)	2E-07 to 3E-05	0.002 to 0.4
Onsite West	Arsenic in soil	Direct contact (outdoor commercial /industrial worker)	6E-05	0.09
	PCE, TCE and cis-1,2-DCE in groundwater (1)	Inhalation in indoor air (indoor commercial/ industrial worker) (2)	5E-08 to 2E-03	0.0007 to 27
Atlas Heater	PCE, TCE and cis-1,2-DCE in groundwater (1)	Inhalation in indoor air (indoor commercial/ industrial worker) (2)	4E-08 to 5E-04	0.0006 to 6
Atlas to Central	PCE, TCE and cis-1,2-DCE in groundwater (1)	Inhalation in indoor air (indoor commercial/ industrial worker) (2)	2E-08 to 6E-05	0.0000008 to 0.7
Central to Arques	PCE, TCE and cis-1,2-DCE in groundwater (1)	Inhalation in indoor air (indoor commercial/ industrial worker) (2)	1E-08 to 1E-05	0.00003 to 0.1

Table Notes:
(1) The constituents of concern in groundwater include PCE, TCE and cis-1,2-DCE. The resulting cumulative hazard indices greater than 1 and cancer risks greater than 1E-05 are attributed to PCE and/or TCE only.
(2) Each groundwater monitoring well was evaluated separately to ensure that indoor air risks were not underestimated based on area-wide averages; therefore, the hazard indices and cancer risks are presented as a range of values.

For comparison, the Water Board considers the following risks to be acceptable at remediation sites: a cumulative hazard index of 1.0 or less for non-carcinogens, and a cumulative excess cancer risk of 10^{-4} or 10^{-6} or less for carcinogens.

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 (1) 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 until cleanup standards are met, and prohibits sensitive uses of the site such as residences and daycare centers and (2) regular public notifications in the form of

fact sheets to City of Sunnyvale and affected offsite landowners and occupants of the presence of groundwater contamination and associated potential threats (e.g., vapor intrusion to buildings, VOC exposure during construction-related dewatering activities).

11. **Feasibility Study**: Several remedial alternatives were comparatively studied and analyzed with respect to their effectiveness, implementability, benefits, cost, and protection of public health and the environment. Detailed analysis of remedial alternatives for each area of concern by media (unsaturated soil or groundwater) and the criteria used to evaluate each alternative are presented in the Final Remedial Action Plan.

12. **Final Remedial Action Plan**: Mohawk submitted a Final Remedial Action Plan on February 28, 2007, for cleanup of soil and groundwater at the site. Based on the evaluation process, several remedial alternatives were selected as the preferred remedial actions for various onsite and offsite areas of concern. The following is a summary of the selected remedial alternatives for the areas of concern:

Area of Concern	Soil Remedial Alternatives	Groundwater Remedial Alternatives
Onsite East	Deed restriction and soil vapor extraction	Monitored natural attenuation
Onsite West	Deed restriction and soil vapor extraction	Chemical oxidation using existing ozone injection system
Atlas Heater	Not applicable	Enhanced anaerobic biodegradation
Atlas to Central	Not applicable	Permeable reactive barrier and monitored natural attenuation
Central to Arques	Not applicable	Monitored natural attenuation
North of Arques	Not applicable	Monitored natural attenuation

13. **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. The previously-cited remedial action plan confirms the Water 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 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 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 Water Board and approved by the State Water Resources Control 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

At present, there is no known use of groundwater underlying the site for the above purposes.

c. **Basis for Groundwater Cleanup Standards**: Short-term groundwater cleanup standards are based on potential vapor intrusion concerns. Values are from Table E-1a of the Interim Final Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater (Water Board, February 2005) for commercial/industrial land use with high permeability of vadose zone soil. The long-term groundwater cleanup standards for the site are based on applicable water quality objectives and are the California maximum contaminant levels (MCLs). Cleanup to this level will protect beneficial uses of groundwater and will result in acceptable residual risk to humans. Groundwater cleanup standards are shown in section B.3 below.

d. **Basis for Soil Cleanup Standards**: The soil cleanup standards for the site are based on potential vapor intrusion and soil leaching concerns. The values are from Table B-2 (shallow soil, commercial/industrial land use) and Table D-2 (deep soil, commercial/industrial land use) from Volume 2 of the Interim Final Screening for Environmental Concerns at Sites with Contaminated Soil and

Groundwater (Water Board, February 2005) for commercial/industrial land use. Cleanup to this level is intended to prevent leaching of contaminants to groundwater and will result in acceptable residual risk to humans. Soil cleanup standards are shown in section B.2 below.

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 nor economically achievable within a reasonable period of time, then the dischargers 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 Water Board may decide that further cleanup actions should be taken.

15. **Reuse or Disposal of Extracted Groundwater**: Water 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**: The dischargers have 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 dischargers are hereby notified that the Water Board is entitled to, and may seek reimbursement 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.

18. **CEQA**: This action is an order to enforce the laws and regulations administered by the Water 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 Water Board has notified the dischargers 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 Water 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 dischargers (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 that 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. FINAL REMEDIAL ACTION PLAN AND CLEANUP STANDARDS

1. **Implement Final Remedial Action Plan:** The dischargers shall implement the Final Remedial Action Plan described in Finding 12.

2. **Soil Cleanup Standards:** The following soil cleanup standards 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 plans described in Finding 12 (Final Remedial Action Plan).

Soil Cleanup Standards

Constituent	Soil Cleanup Standard (mg/kg)	Basis
tetrachloroethene (PCE)	0.24	Vapor Intrusion
trichloroethene (TCE)	0.73	Vapor Intrusion
cis-1,2-dichloroethene (cis-1,2-DCE)	3.6	Vapor Intrusion
trans-1,2-dichloroethene (trans-1,2-DCE)	7.3	Vapor Intrusion
vinyl chloride	0.019	Vapor Intrusion
chlorobenzene	1.5	Soil Leaching

Constituent	Soil Cleanup Standard (mg/kg)	Basis
1,2-dichlorobenzene (1,2-DCB)	1.6	Soil Leaching
1,3-dichlorobenzene (1,3-DCB)	7.4	Soil Leaching
1,4-dichlorobenzene (1,4-DCB)	0.13	Vapor Intrusion
TPH (gasoline)	400	Soil Leaching
TPH (middle distillates)	500	Soil Leaching

Table Notes:
Vapor intrusion-based values from Table D-2 and soil leaching-based values from Table B-2 of Volume 2 of the Interim Final Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater (Water Board, February 2005).
mg/kg = milligrams per kilogram

3. **Groundwater Cleanup Standards:** The following groundwater cleanup standards shall be met throughout the area of impacted groundwater, and in all groundwater monitoring wells identified in the Self-Monitoring Program. In addition to meeting the curtailment criteria described in Task C8 "Proposed Curtailment", the short-term cleanup standards for groundwater shall be met prior to curtailment of active remediation.

Groundwater Cleanup Standards

Constituent	Short-Term Groundwater Cleanup Standards for Active Remediation (µg/L) (1)	Final Long-Term Groundwater Cleanup Standards (µg/L)
tetrachloroethene (PCE)	420	5.0 (2)
trichloroethene (TCE)	1,800	5.0 (2)
cis-1,2-dichloroethene (cis-1,2-DCE)	17,000	6.0 (2)
trans-1,2-dichloroethene (trans-1,2-DCE)	NA	10 (2)
vinyl chloride	NA	0.5 (2)
1,2-dichlorobenzene (1,2-DCB)	NA	600 (2)
1,4-dichlorobenzene (1,4-DCB)	NA	5.0 (2)
TPH (gasoline)	NA	100 (3)
TPH (middle distillates)	NA	100 (3)

Table Notes:
(1) Based on vapor intrusion concerns. Values from Table E-1a of the Interim Final Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater (Water Board February 2005) for commercial/industrial land use with high permeability of vadose zone soil.
(2) Based on drinking water standards. Values are California Maximum Contaminant Levels.
(3) Based on taste and odor. Values from Table I-1 of the Water Board February 2005.
µg/L = micrograms per liter
NA = not applicable

C. TASKS

1. WORKPLAN FOR SOIL VAPOR AND INDOOR AIR SAMPLING

COMPLIANCE DATE: September 30, 2007

Submit a workplan acceptable to the Executive Officer to define the extent of vapor intrusion concerns. The workplan shall include collection and analysis of soil vapor and indoor air samples from selected buildings in the Atlas Heater area and the Atlas to Central area. The workplan shall propose ongoing sampling at selected locations, to show temporal variation in soil vapor and/or indoor air VOC concentrations. The workplan shall include criteria for increased indoor air sampling frequency if elevated VOC concentrations are observed.

2. COMPLETION OF SOIL VAPOR AND INDOOR AIR SAMPLING

COMPLIANCE DATE: November 30, 2007, and every six months thereafter

Submit semi-annual technical reports acceptable to the Executive Officer documenting completion of the tasks identified in the Task 1 workplan.

3 WORKPLAN FOR VAPOR INTRUSION MITIGATION

COMPLIANCE DATE: 30 days after requested by Executive Officer

Submit a workplan acceptable to the Executive Officer proposing vapor intrusion mitigation at buildings where indoor air sampling has demonstrated persistent VOC impacts from vapor intrusion at levels exceeding ESLs. The workplan shall describe the type, design, and location of proposed vapor mitigation systems, and shall include an implementation schedule.

4. COMPLETION OF VAPOR INTRUSION MITIGATION

COMPLETION DATE: According to schedule in Task 3 approved by the Executive Officer

Submit a technical report acceptable to the Executive Officer documenting completion of tasks identified in the Task 3 workplan. For ongoing activities, this report shall document startup of vapor intrusion mitigation systems.

5. PROPOSED INSTITUTIONAL CONSTRAINTS

COMPLIANCE DATE: August 31, 2007

Submit a technical report acceptable to the Executive Officer documenting procedures to be used by the dischargers to prevent or minimize human exposure to soil and groundwater contamination prior to meeting cleanup standards. Such procedures shall include (1) a deed restriction prohibiting the use of shallow zone groundwater as a source of drinking water, residential uses, daycares, playgrounds, schools and hospitals, and (2) public notifications in the form of fact sheets mailed regularly (no less than once per year) to the Water Board, the City of Sunnyvale and to affected offsite landowners and occupants. The regular notifications shall describe the presence of groundwater contamination and associated potential threats (e.g., vapor intrusion to buildings, VOC exposure during construction-related dewatering activities). For each notification, the Water Board shall receive a copy of the notification, a list of recipients, and a description of methods used to deliver the notification.

6. IMPLEMENTATION OF INSTITUTIONAL CONSTRAINTS

COMPLIANCE DATE: October 31, 2007

Submit a technical report acceptable to the Executive Officer documenting completion of the necessary tasks identified in the Task 5 workplan (i.e., copy of the recorded deed restriction and first annual notification).

7. FIVE-YEAR STATUS REPORT

COMPLIANCE DATE: July 31, 2012, 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 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 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 groundwater treatment and monitoring 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). 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.

9. IMPLEMENTATION OF CURTAILMENT

COMPLIANCE DATE: 60 days after Executive Officer approval of Task 8 workplan

Submit a technical report acceptable to the Executive Officer documenting completion of the tasks identified in the Task 8 workplan.

10. WORKPLAN FOR ALTERNATE REMEDIAL ACTION PLAN

COMPLIANCE DATE: 90 days after requested by Executive Officer

Submit a workplan acceptable to the Executive Officer for implementation of an alternate remedial action plan in the event that the remedial activities specified in the Order are not effective in achieving cleanup standards.

11. IMPLEMENTATION OF ALTERNATE REMEDIAL ACTION PLAN

COMPLIANCE DATE: 180 days after Executive Officer approval of Task 10 workplan.

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 bearing on the approved cleanup 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 cleanup plan or cleanup standards.

14. **DELAYED COMPLIANCE**:

If the dischargers are delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the dischargers 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 (O&M)**: The dischargers 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 dischargers 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 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 dischargers 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 dischargers 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 which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the dischargers.

5. **Self-Monitoring Program**: The dischargers 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 EPA methods 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**: Electronic copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided within two weeks of the established task deadline to the following recipients:

   a. City of Sunnyvale, Department of Public Safety
   b. Santa Clara County Department of Environmental Health
   c. Santa Clara Valley Water District

The Executive Officer may modify this distribution list as needed.

9. **Reporting of Changed Owner or Operator**: The dischargers shall file a written report on any changes in site occupancy or ownership associated with the property described in this Order. This report shall be filed with the Water Board within 30 days following a change in site occupancy or ownership.

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 dischargers 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 Water Board Order No. 00-106.

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 July 11, 2007.

Bruce H. Wolfe
Executive Officer

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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

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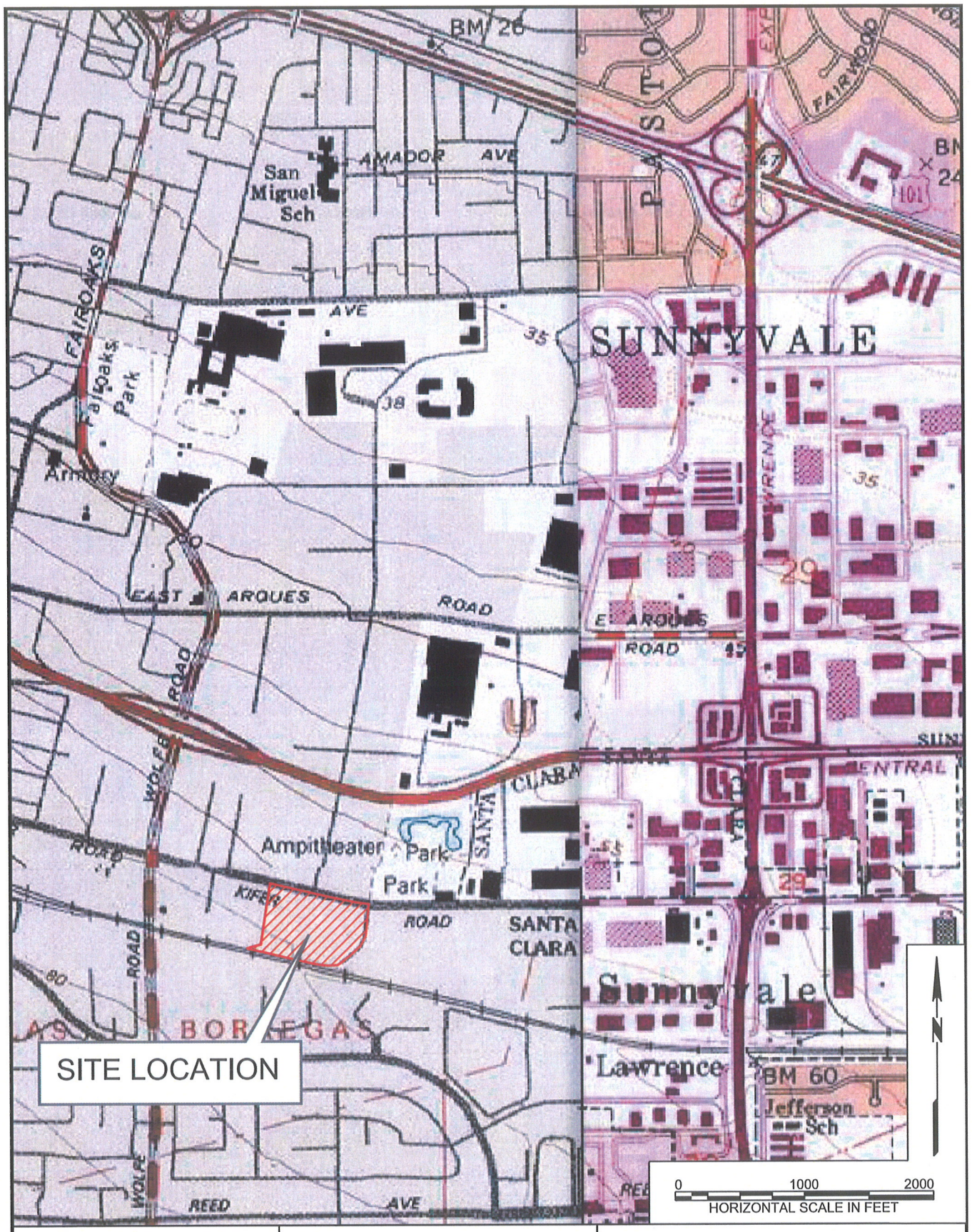
Attachments:
Figure 1- Site Location Map
Figure 2- Site Plan
Figure 3- Areas of Concern Location Map
Self-Monitoring Program

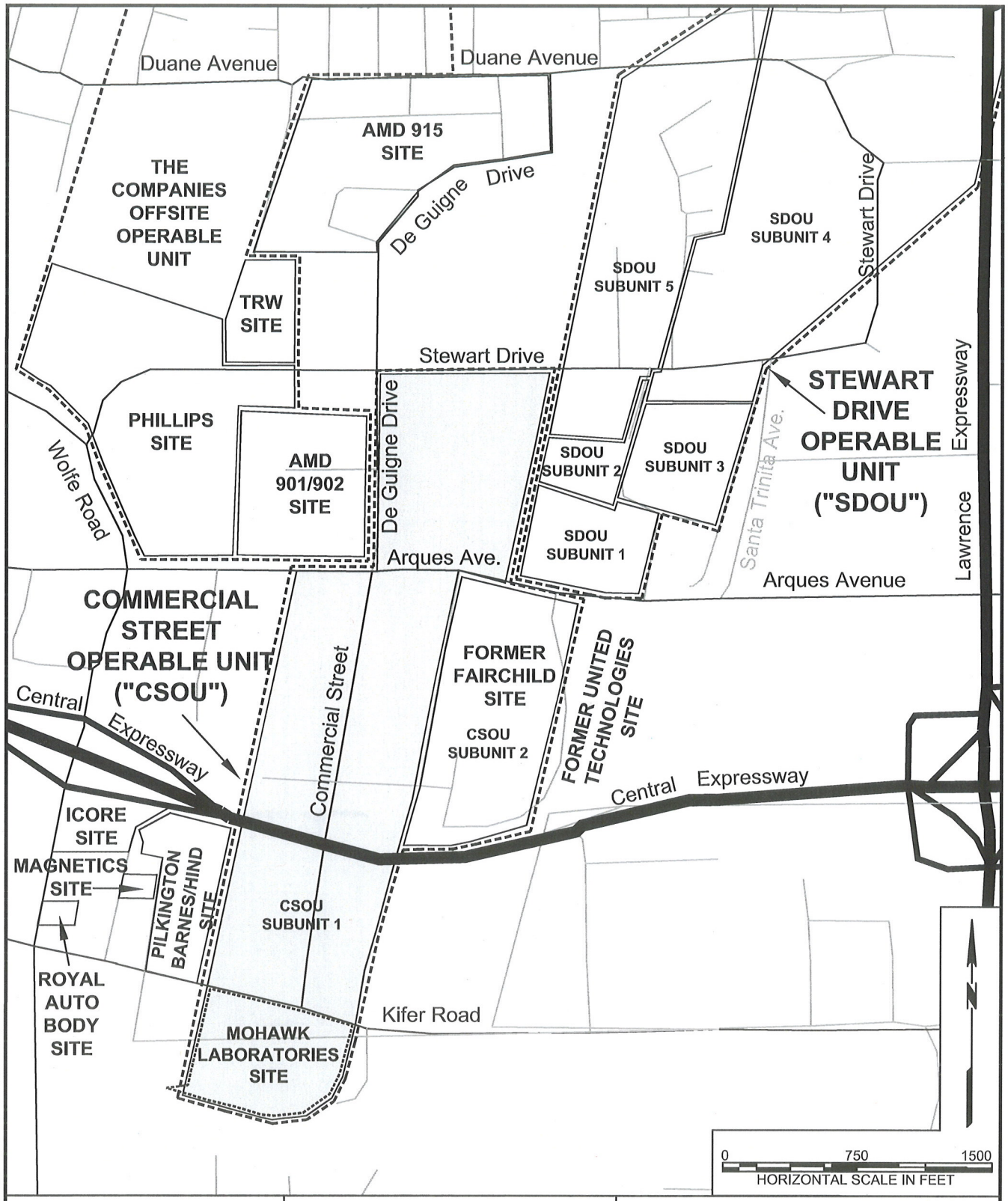


SGI environmental THE SOURCE GROUP, INC.
3451-C VINCENT ROAD
PLEASANT HILL, CA 94523

MOHAWK LABORATORIES
SUNNYVALE, CALIFORNIA

SOURCE:
USGS 7.5' QUAD SHEET, CUPERTINO, CALIFORNIA
PHOTOREVISED 1992

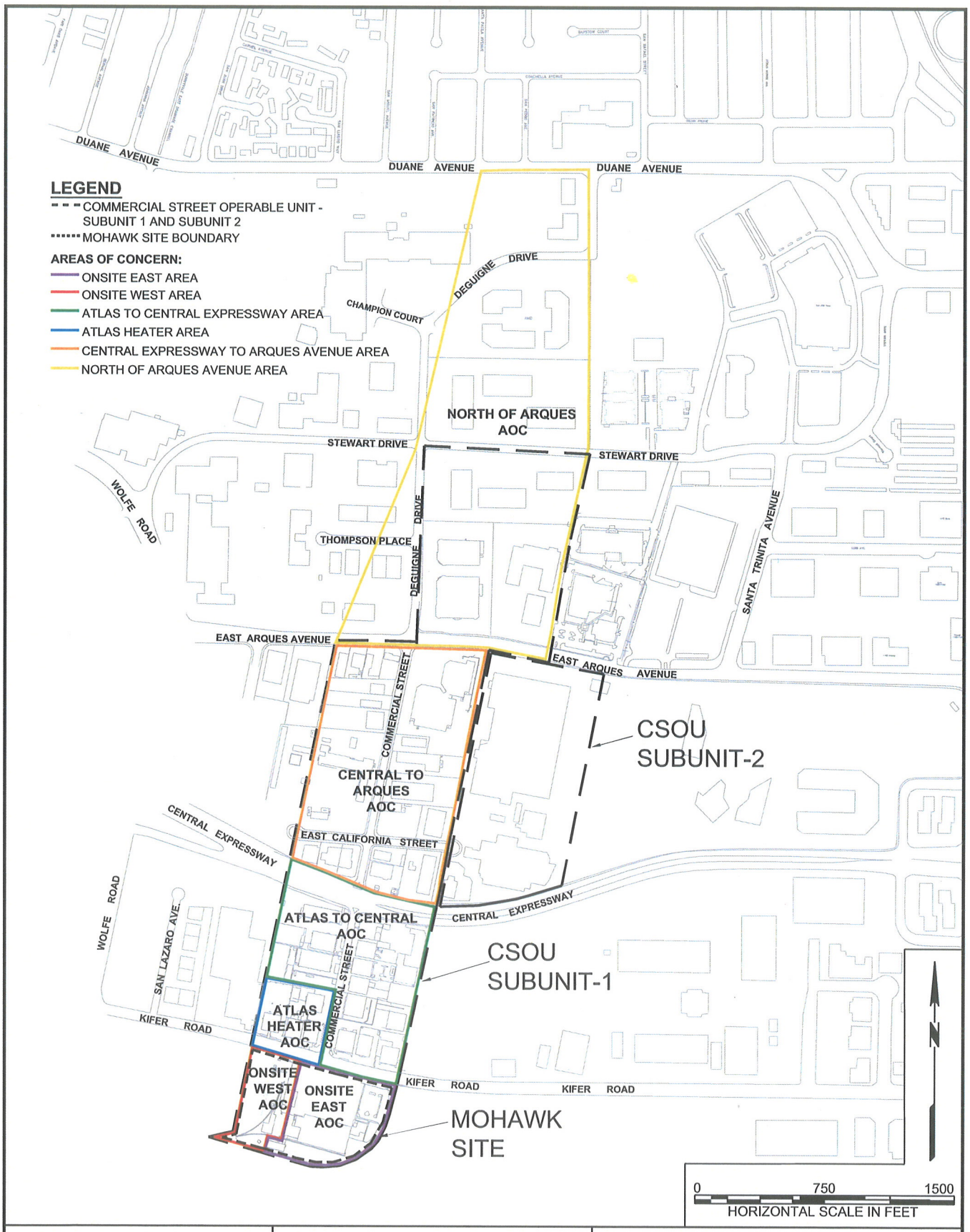
FIGURE 1
SITE LOCATION MAP



SGI environmental THE SOURCE GROUP, INC.
3451-C VINCENT ROAD
PLEASANT HILL, CA 94523

MOHAWK LABORATORIES
SUNNYVALE, CALIFORNIA

FIGURE 2
SITE PLAN



SGI environmental
THE SOURCE GROUP, INC.
3451-C VINCENT ROAD
PLEASANT HILL, CA 94523

MOHAWK LABORATORIES
SUNNYVALE, CALIFORNIA

FIGURE 3
AREAS OF CONCERN
LOCATION MAP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

NCH CORPORATION AND MOHAWK LABORATORIES

for the property located at

932 KIFER ROAD
COMMERCIAL STREET OPERABLE UNIT, SUBUNIT 1
SUNNYVALE
SANTA CLARA COUNTY

1. **Authority and Purpose**: The Water Board requires the technical reports 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. R2-2007-0047 (Site Cleanup Requirements).

2. **Monitoring**: The dischargers shall measure groundwater elevations semi-annually in all monitoring wells listed in the table below, according to a schedule developed in coordination with other dischargers in the area. Representative samples of groundwater shall also be collected and analyzed according to the following schedule:

Well ID No.	Sampling Frequency	Well Location	Well ID No.	Sampling Frequency	Well Location
BC-02	A	Onsite West	WA-02	SA	Central-Arques
BC-03[1,2]	SA	Onsite West	WA-03	A	Central-Arques
BC-03B	A	Onsite West	WA-04	SA	Central-Arques
BC-05A	SA	Onsite West	WA-06	A	Central-Arques
BC-06[1]	A	Onsite West	WA-08	A	Central-Arques
BC-04[1]	A	Onsite East	WA-10	A	Central-Arques
PAMW-01	A	Onsite East	WA-11[1]	SA	Central-Arques
BC-12	SA	Atlas Heater	PZ-1006C[1]	SA	Central-Arques
BC-13	SA	Atlas Heater	PZ-1009B[1,2]	SA	Central-Arques
BC-16	SA	Atlas-Central	PZ-1015C	SA	Central-Arques
BC-17	SA	Atlas-Central	PZ-1024B	SA	Central-Arques
BC-18	A	Atlas-Central	14-S	A	North of Arques

Well ID No.	Sampling Frequency	Well Location		Well ID No.	Sampling Frequency	Well Location
BC-19	A	Atlas Heater		17-S	A	North of Arques
PMW-03	A	Atlas-Central		NMW-01	A	North of Arques
PMW-04	A	Atlas-Central		NMW-02	A	North of Arques
PZ-03B	A	Atlas Heater		NMW-03	A	North of Arques
PZ-03C	A	Atlas Heater		NMW-04[1]	SA	North of Arques
PZ-05C[1]	SA	Atlas Heater		NMW-05	A	North of Arques
PZ-08B	SA	Atlas Heater		NMW-06	SA	North of Arques
PZ-08C[2]	SA	Atlas Heater		NMW-07[1]	SA	North of Arques
PZ-09B[1,2]	SA	Atlas Heater		NMW-11	A	Central-Arques
PZ-10B	SA	Atlas Heater		13-S	SA	North of Arques
PZ-10C[2]	SA	Atlas Heater		46-S	A	North of Arques
PZ-12B[1,2]	SA	Atlas Heater		MW-09[1]	SA	North of Arques
PZ-14C[2]	SA	Atlas Heater		NMW-09	A	North of Arques
PZ-16B	SA	Atlas Heater		NMW-12A	SA	North of Arques
RBD-03B[1,2]	SA	Atlas Heater		NMW-12B	SA	North of Arques
RBD-04	SA	Atlas-Central		NMW-13[1]	SA	North of Arques

Table Notes:

[1] Monitoring well included in the Monitored Natural Attenuation program for the site.

[2] Monitoring well included in the petroleum hydrocarbons sampling for the site.

Key: SA = Semi-Annually A = Annually

Groundwater monitoring wells indicated for semi-annual sampling shall be sampled in April and October. Wells indicated for annual sampling shall be sampled in October. All samples shall be analyzed by EPA Test Method 8260 or equivalent. In addition, samples collected from monitoring wells that are included in the Monitored Natural Attenuation (MNA) program for the site shall be analyzed by EPA Test Methods 200.7, 300, 310.1, 376.2, 415.1, 3500 and SW 3810 modified or equivalent. Samples collected from monitoring wells that are included in the petroleum hydrocarbon sampling shall be analyzed by EPA Test Method 8015M or equivalent. Any new monitoring or extraction wells shall be sampled quarterly and analyzed for the same constituents as samples from existing wells. The dischargers or Water Board staff may propose changes in the above table; any proposed changes are subject to Executive Officer approval.

3. **Semi-Annual Monitoring Reports**: The dischargers shall submit semi-annual monitoring reports to the Water Board no later than 30 days following the end of the second and fourth quarters. 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 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.

   b. Groundwater Elevations: Groundwater elevation data shall be presented in tabular form, and a groundwater elevation contour map shall be prepared for each monitored water-bearing zone. These maps should include groundwater elevations from all wells listed in the table in Item 2. Historical groundwater elevations shall be included in the second semi-annual report each year.

   c. Groundwater Analyses: Groundwater sampling data shall be presented in tabular form, and isoconcentration maps should be prepared for key contaminants (PCE, TCE, cis-1,2-DCE, and petroleum hydrocarbons) for each monitored water-bearing zone. These maps should include groundwater contaminant concentrations from all wells listed in the table in Item 2. 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).

   d. 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 second semi-annual report each year.

   e. 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 reporting period.

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

5. **Other Reports**: The dischargers 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.

6. **Record Keeping**: The dischargers or their 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.

7. **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.

I, Bruce H. Wolfe, Executive Officer, hereby certify that this Self-Monitoring Program was adopted by the Water Board on July 11, 2007.

Bruce H. Wolfe
Executive Officer