CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. R2-2012-0077

ADOPTION OF REVISED FINAL SITE CLEANUP REQUIREMENTS and
RECISION OF ORDER NOS. 99-096, 99-097 and 99-100 for:

999 ARQUES CORPORATION

For the property located at:

995-999 EAST ARQUES AVENUE, 1077 EAST ARQUES AVENUE, AND 968-970 STEWART DRIVE, SUBUNIT 1, SUBUNIT 2, AND SUBUNIT 5 OF STEWART DRIVE OPERABLE UNIT, SUNNYVALE, SANTA CLARA COUNTY

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

1. **Site Location and Description**: The Stewart Drive Operable Unit (SDOU) is located in Sunnyvale, near the intersection of U.S. Highway 101 and the Lawrence Expressway (see attached site map). The locations of Subunits 1, 2, and 5 of SDOU (Site) are shown on the attached site map. Subunit 1 of SDOU consists of the 999 East Arques Avenue property and the western half of the southern portion of the adjacent CAE Electronics, Inc. (CAE) property at 1077 East Arques Avenue. Subunit 2 of SDOU consists of the 968-970 Stewart Drive property. Subunit 5 of SDOU consists of properties located north of Subunit 2 within SDOU. Currently, SDOU is occupied by several large office complexes and a Fry's Electronics store, with residential properties in the northern portion of Subunit 5. SDOU is located in an area of low to flat relief approximately 5 miles south of San Francisco Bay. Areas surrounding the Site are commercial, industrial, and residential.

2. **Site History**: Microwave Associates (West), Inc., subsequently known as M/A-COM, Inc., (M/A-COM) owned and occupied the 999 East Arques site (Subunit 1 of SDOU) from August 1967 to October 1973. M/A-COM manufactured traveling wave tubes, microwave semiconductors, and radio frequency equipment at its site. M/A-COM ceased operations at Subunit 1 in 1973. Manufacturing procedures used by M/A-COM included vapor degreasing and ultrasonic cleaning processes that used trichloroethylene (TCE). A sump used by M/A-COM was formerly located on the eastern portion of the Subunit 1. In 1978, the 999 East Arques site was sold to New England Mutual Life Insurance Company (NEM). In 1979, AMETEK, Inc., (AMETEK) became a tenant at the site. AMETEK installed an acid waste neutralization system and manufactured refurbished silicon crystals from 1979 until it vacated the site in 1987. In 1990, the buildings were demolished. The site was vacant until 1992, when the existing office complex was constructed following completion of excavation activities discussed in Finding 10. In 1992 M/A-COM, AMETEK, and NEM settled all disputes among them regarding the pollution at and emanating from the site and jointly formed the 999 Arques Corporation. Robert and Millicent Wise Property Trust and the Patricia D. Wise Trust are the current owners of a portion of Subunit 1 (the western half of the southern portion of the 1077 East Arques property). The 999 Arques Corporation has

assumed full responsibility for meeting all cleanup requirements. Due to corporate changes since 1999, the three companies that currently comprise the 999 Arques Corporation are Metropolitan Life Insurance Company (successor to NEM), Tyco Electronics Corporation (successor to M/A-COM), and AMETEK.

Sobrato Development Company owned the property at 968-970 Stewart Drive (Subunit 2 of SDOU) until October 26, 2009. Mr. Mark Dellamano is the current owner of Subunit 2. In 1980 Subunit 2 was developed with the construction of a concrete building. Inprint Corporation (Inprint) leased the western portion of the building while TRW/ESL leased the eastern portion. Inprint's activities at Subunit 2 included commercial printing, photographic developing, and copying. Between 1980 and 1983, Inprint operated and maintained a 1000-gallon underground tank for temporary storage of used fountain solution and small amounts of isopropyl alcohol and glycerin.

3. **Operable Unit and Subunits**: In 1996 site cleanup requirements, the Regional Water Board defined the Stewart Drive Operable Unit (SDOU) and five subunits within SDOU. SDOU was defined to allow individual dischargers to proceed with investigation and cleanup independently of other dischargers, given evidence of possible commingling of groundwater pollution. Subunits 1-3 are sites that have been identified as sources of groundwater contamination; and subunits 4 and 5 are offsite, downgradient areas that do not have any identified sources of contamination, but are impacted by sources found on subunits 1-3.

4. **Named Dischargers**: As described in more detail below, the 999 Arques Corporation has assumed full responsibility for meeting all cleanup requirements for subunits 1, 2 and 5, and hereinafter is referred to as the "discharger." As indicated in Finding 2, the 999 Arques Corporation is comprised of the following three companies: 1) Metropolitan Life Insurance Company, 2) Tyco Electronics Corporation, and 3) AMETEK. The 999 Arques Corporation is named as a discharger because of substantial evidence that one or more entities of which it is comprised discharged pollutants to soil and groundwater at the Site; owned or operated the property during or after the time of the activity that resulted in the discharge; had knowledge of the discharge or the activity that caused the discharge; and/or had the legal ability to prevent the discharge. The specific facts concerning each entity are detailed below.

The following current and past property owners and operators qualify as dischargers but are not named as dischargers:

a. Metropolitan Life Insurance Company qualifies as a discharger because it is the current owner of the property (a portion of Subunit 1) on which there is an ongoing discharge of pollutants, it has knowledge of the discharge or the activities that caused discharge, and it has the legal ability to control the discharge

b. Tyco Electronics Corporation qualifies as a discharger because it acquired M/A-COM in April 1999 and, as a successor, it assumed responsibility for M/A-COM's environmental liabilities. There is substantial evidence that M/A-COM discharged pollutants to soil and groundwater at the Site, including its use of chlorinated solvents in its manufacturing operations, the presence of these same pollutants in soil

in the immediate vicinity of the sump (which received wastewater containing these pollutants), and the presence of these same pollutants in groundwater beneath and downgradient of the sump. Furthermore, Tyco Electronics Corporation qualifies as a discharger because M/A-COM, a predecessor entity, owned a portion of the Site (Subunit 1) during or after the time of the activity that resulted in the discharge, had knowledge of the discharge or the activities that caused the discharge, and had the legal ability to prevent the discharge.

c. AMETEK qualifies as a discharger because of substantial evidence that it discharged pollutants to soil and groundwater at the Site, including its use of chlorinated solvents in its manufacturing operations, the presence of these same pollutants in soil in the immediate vicinity of the acid waste neutralization system (which received wastewater containing these pollutants), and the presence of these same pollutants in groundwater at and downgradient of the acid waste neutralization system. AMETEK also qualifies as a discharger because it had knowledge of the discharge or the activities that caused discharge, and it had the ability to control the discharge.

d. Sobrato Development Company qualifies as a discharger because it owned the property (Subunit 2) during the time of the activity that resulted in the discharge, had knowledge of the discharge or the activities that caused the discharge, and had the legal ability to prevent the discharge.

e. Inprint (currently American Reprographics Company) qualifies as a discharger because of substantial evidence that it discharged pollutants to soil and groundwater at the Site, including its use of chlorinated solvents in its manufacturing operations, the presence of these same pollutants in soil in the immediate vicinity of the underground storage tank (which received wastewater containing these pollutants), and the presence of these same pollutants in groundwater at and downgradient of the underground storage tank. Inprint also qualifies as a discharger because it had knowledge of the discharge or the activities that caused discharge, and it had the ability to control the discharge.

f. Robert and Millicent Wise Property Trust and the Patricia D. Wise Trust qualify as dischargers because they are the current owners of the property (a portion of Subunit 1) on which there is an ongoing discharge of pollutants, it has knowledge of the discharge or the activities that caused discharge, and it has the legal ability to control the discharge.

g. Mark Dellamano qualifies as a discharger because he is the current owner of the property (Subunit 2) on which there is an ongoing discharge of pollutants, he has knowledge of the discharge or the activities that caused discharge, and he has the legal ability to control the discharge.

The above-listed current and past property owners and operators are not named as dischargers in this order for the following reasons: the 999 Arques Corporation has adequate financial resources to comply with this Order, the 999 Arques Corporation has complied

with the prior order, and the 999 Arques Corporation has requested that the above-listed current and past property owners and operators not be named in this Order. However, the above-listed current and past property owners and operators may be named in the future if these circumstances change.

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

5. **Regulatory Status**: The Site has been subject to final Site Cleanup Requirements Order Nos. 99-096, 99-097 and 99-100, adopted November 18, 1999.

6. **Site Hydrogeology**: The area in the vicinity of SDOU is underlain by unconsolidated alluvial channel and overbank deposits of clay, silt, sand, and gravel. The deposits are of variable thickness and laterally discontinuous. The uppermost deposits have been subdivided into four general aquifer (water producing) zones, designated as the A, B1, B2, and B3 aquifers. The aquifers are separated by semi-permeable to relatively impermeable saturated zones (aquitards), ranging from 5 to 20 feet thick. The unconfined, shallow A-aquifer is generally encountered at a depth of 10 to 20 feet below the ground surface. The confined B-1, B-2, and B-3 aquifers are generally encountered between 20 to 45 feet, 45 to 60, and 70 to 80 feet, respectively, below ground surface. Groundwater flows preferentially through channelized coarse-grained deposits within each aquifer. The groundwater gradient within the A and B aquifers in the area is generally toward the north-northeast. The shallow groundwater beneath the Site is not used for drinking water.

7. **Remedial Investigation**: TCE is the predominant volatile organic compound (VOC) detected in vadose zone soil in Subunit 1 of SDOU; the greatest historic VOC concentrations in soil were detected on the eastern portion of the Subunit, in the area of the former sump. Prior to remediation, TCE concentrations in soil ranged from below reporting limits to 12 ppm. Soils were also impacted with other VOCs, including 1,1,1-trichloroethane (TCA), tetrachloroethene (PCE), methyl ethyl ketone (MEK), and toluene. The A-aquifer and B-1 aquifer groundwater has also been impacted by VOCs. The highest VOC concentrations in groundwater have also been detected in the area of the former sump, on the eastern portion of the Subunit 1. The lateral and vertical extent of the groundwater plume is adequately defined. The following are maximum groundwater concentrations in A- and B-1 aquifers as of October 2011:

Aquifer	PCE	TCE	Cis-1,2-Dicholoroethene	Vinyl Chloride
A	<100	456	10,460	5,480
B-1	<0.5	0.98	0.63	58

Concentrations are in micrograms per liter (ug/L).

Groundwater contamination originating from Subunit 1 of SDOU is commingled with contamination originating from other SDOU sources and other upgradient sites. However, data indicate that contamination originating from Subunit 1 of SDOU is located largely within the area of SDOU subunits 1, 2, and 5, and that Subunit 1 of SDOU is the primary

contributor to SDOU Subunit 1, 2, and 5 groundwater contamination, although, in the downgradient portion of Subunit 5, a significant portion of the cis-1,2-dichloroethene in groundwater is due to migration from the adjacent Commercial Street Operable Unit (CSOU) to the west of SDOU.

Soil gas monitoring has been performed at the Site since April 2006. Current maximum TCE and PCE concentrations are 44,000 ug/m ^{3} and 2,100 ug/m ^{3}, respectively. These concentrations slightly exceed the Regional Water Board's environmental screening levels (ESLs) for commercial/industrial land use.

Indoor air monitoring was performed in the building located at 999 East Arques Avenue in April and October 2007 and February 2012. Current maximum TCE and PCE concentrations in indoor air are below the commercial/industrial land use ESLs.

8. **Risk Assessment**: The 1999 risk assessment included an evaluation of chemicals of concern, primarily TCE and cis-1,2-dichloroethene, as well as acetone, chloroform, 1,1-dichloroethane, 1,1,-dichloroethene, trans-1,2-dichloroethene, PCE, and TCA in soil and groundwater. Chemicals were evaluated for carcinogenic and non-carcinogenic effects over short- and long-term exposure, and under several exposure scenarios, including inhalation, ingestion, and dermal contact. The risk assessment was based on current land use conditions, which is commercial in subunits 1 and 2 of SDOU, and commercial and residential in Subunit 5 of SDOU. There is no reasonably foreseeable future land use other than the current land use. The calculated hazard indexes from ingestion, inhalation and dermal exposure scenarios to VOCs range from 0.05 to 0.6. The calculated lifetime cancer risk from ingestion, inhalation and dermal exposure to impacted shallow groundwater ranges from 1×10^{-6} to 7×10^{-4}.

Subsequent to the 1999 risk assessment, additional soil gas and indoor air monitoring has been conducted. Vapor intrusion risk associated with potential migration of VOCs present in soil gas and groundwater was evaluated in the 2009-2010 Biennial Monitoring and Five-Year Review Report for the Site. The VOC concentrations during the April and October 2007 and February 2012 sampling events have been above the screening level in soil gas but below the screening level in indoor air.

9. **Adjacent Sites**: Several other sites are located in the area, which are also sources of soil and/or groundwater pollution. Immediately east and south (upgradient) of SDOU is Operable Unit 1 (OU1), which consists of two federal Superfund sites. OU1 includes the National Semiconductor Corporation (NSC) site at 2900 Semiconductor Drive, the former United Technologies Corporation (UTC) site at 1050 East Arques Avenue, the Advanced Micro Devices site at 1165 East Arques Avenue, and the commingled areas extending downgradient of those sites. Final Remedial Action Plans (RAPs) for the facilities in OU1 were adopted by the Regional Water Board in September 1991. As with SDOU, OU1 is divided into subunits.

Investigations conducted in OU1 and SDOU in 1994 and 1995 indicate that groundwater contamination originating from both operable units is commingled along the area of the

common OU1/SDOU boundary. However, the location of the boundary approximates the extent of significant contamination originating within each operable unit. Groundwater contamination originating in OU1 is largely limited to the area of OU1; groundwater contamination originating in SDOU is largely limited to the area of SDOU.

Southwest and upgradient of SDOU is the Commercial Street Operable Unit (CSOU), which includes the commingled VOC pollution plume originating from the former Schlumberger Technologies Corporation site, located at 974 East Arques Avenue, and the Mohawk Laboratories (Mohawk) site, located at 932 Kifer Road. Recent data indicate that low levels of VOCs originating from one or more of these sites have impacted Subunit 1 of SDOU and the downgradient portion of Subunit 5. Several remedial measures have been implemented in CSOU during the past 10 years. Additional monitoring and cleanup is being conducted to prevent and reduce the migration of the CSOU pollution plume onto the SDOU plume.

The Regional Water Board recently adopted final Site Cleanup Requirement Order No. R2-2007-0047 for the Mohawk and the former Schlumberger Technologies Corporation sites. Mohawk is currently responsible for cleanup and monitoring of both of these sites. Should additional information generated for these and other facilities in the area indicate that VOC groundwater pollution migrating from sources outside of SDOU is ongoing and significantly affects groundwater conditions or long-term groundwater cleanup in SDOU, the Regional Water Board may revise these orders to modify the SDOU and CSOU boundaries or the dischargers, tasks, or groundwater cleanup standards specified in these orders.

10. **Prior Remedial Measures**: In 1987, the structures used to store and/or process hazardous substances were closed and the sumps were removed from the Site. In 1990, approximately 6,000 cubic yards of VOC-impacted soil was excavated, remediated, and placed back onsite. Groundwater remediation, focusing on source control, began in 1990 with the installation and operation of two A-aquifer groundwater extraction wells. Groundwater source control measures were expanded in 1995 with the installation of a B1-aquifer extraction well. The groundwater extraction and treatment (GWET) system was extracting approximately 30,200 gallons per day from the A-aquifer, and 7,300 gallons per day in the B1-aquifer. Operation of the GWET system was suspended in March 2006, concurrent with the start of enhanced anaerobic biodegradation (EAB) treatment, which continues to date. The following are detailed descriptions of EAB injection points, injection frequency, and the amount of treatment compound injected in the A- and B1-aquifer zones beneath the Site:

<u>A-aquifer zone</u>

In March 2006, approximately 3,300 pounds of HRC-X, and 1,410 pounds of HRC-Primer were injected at 78 locations.

In August 2008, approximately 900 pounds of HRC-X were injected at 23 locations.

<u>B1-aquifer zone</u>

In March 2006, approximately 4,200 pounds of HRC were injected into 62 injection locations.

In August 2008, approximately 2.4 pounds of Accelerite, a nutrients amendment, were injected into four injection locations.

The EAB treatment has made significant progress in the reduction of TCE mass and concentrations in the A and B1 aquifer zones beneath the site as follows:

A-aquifer zone

TCE concentrations have decreased from 63,300 ug/L in October 2004 to 338 ug/L (456 ug/L in the duplicate sample) in October 2011, a decline of more than 99%.

Total chlorinated ethene concentrations have decreased from approximately 65,000 ug/L in October 2004 to approximately 16,000 ug/L in October 2011, a decline of approximately 75%.

B1-aquifer zone

TCE concentrations have decreased from 2,880 ug/L in October 2004 to 0.98 ug/L in October 2011, a decline of 99.97%.

Total chlorinated ethene concentrations have decreased from approximately 107,000 ug/L in October 2004 to 60 ug/L in October 2011, a decline of 99.94%.

11. **Revised Feasibility Study**: The 999 Arques Corporation submitted a Revised Remedial Action Plan (RRAP) for subunits 1, 2, and 5 of SDOU, dated January 30, 2012. The RRAP includes a revised feasibility study (RFS). The RFS includes a detailed screening of alternatives for groundwater remedial actions necessary to meet cleanup standards.

a. Groundwater: The RFS evaluates the following remedial alternatives:

- Remedial Alternative 1: No Action;
- Remedial Alternative 2: Continued Hydraulic Containment, Institutional Controls, and Groundwater Monitoring;
- Remedial Alternative 3: Continued Hydraulic Containment, Institutional Controls, and Expanded Groundwater Monitoring; and
- Remedial Alternative 4: *In Situ* EAB Treatment, Monitoring, Engineering Controls and Institutional Controls.

b. Soil: No additional soil remediation is necessary given the previous removal and treatment of soil from Subunit 1.

12. **Revised Remedial Action Plan (RRAP)**: The RRAP is based on several years of data, which indicate that the previous (pump and treat) and current (EAB groundwater treatment) remedy have prevented the migration of high concentrations of VOCs and have lowered VOC concentrations in subunits 1 and 2 of SDOU. Data also indicate that VOCs in groundwater in Subunit 5 are naturally attenuating. The RRAP recommends Remedial Alternative 4 − EAB treatment, monitoring, engineering controls and institutional controls −

as the new remedial alternative for cleanup of groundwater beneath the Site. These three main elements of the RRAP are described further below. The RRAP is already being implemented.

a. **EAB In-Situ Groundwater Treatment**: EAB in-situ groundwater treatment will continue to be implemented as described previously in the 2005 EAB Work Plan, and 2008 and 2010 Addenda. This includes injecting amendments, such as electron donor compounds and/or nutrients, into the A-aquifer and B1-aquifer zones in the former eastern source area to enhance and accelerate naturally-occurring anaerobic bioremediation of chlorinated VOCs. Amendment injections were performed during March 2006 and August 2008. Additional EAB treatment may be performed if groundwater monitoring data such as VOC concentrations, aquifer geochemical parameters, and the remaining electron donor supply indicate further EAB treatment is necessary to meet cleanup standards.

b. **Monitoring**: Ongoing monitoring is the second major component of the RRAP. Current monitoring plans include groundwater monitoring, soil gas monitoring, and indoor air monitoring, as described below:

   Groundwater monitoring at the Site is currently performed in accordance with two different monitoring programs: (a) the self-monitoring program (SMP), which addresses groundwater monitoring across subunits 1, 2, and 5 of SDOU; and (b) the EAB monitoring program, which is focused on groundwater monitoring within and immediately downgradient of the EAB treatment area in Subunit 1 of SDOU. The two monitoring programs are included in the attached modified SMP.

   Soil gas monitoring has been performed at the Site since April 2006. The monitoring program is included in the attached modified SMP.

   Indoor air monitoring was performed in the building located at 999 East Arques Avenue in April and October 2007. An additional round of indoor air monitoring was conducted on February 11, 2012. Indoor air monitoring and reporting will continue and will adhere to the same protocols as were followed for the 2007 indoor air monitoring events, as described in the 2007 Work Plan for Indoor Air Sampling prepared for the 999 East Arques Avenue building. The monitoring program is included in the attached modified SMP.

c. **Engineering Controls**: As described in the RRAP, the heating, ventilation and air-conditioning (HVAC) system in the 999 East Arques Avenue building will be operated to mitigate potential VOC vapor intrusion into indoor air.

d. **Institutional Controls**: A Covenant and Environmental Restriction on Property (i.e., deed restriction) will be recorded for the 999 East Arques Avenue property. The restriction shall, at a minimum, include the following elements:

   - Notify future owners of sub-surface contamination;
   - Prohibit the use of shallow groundwater beneath the Site as a source of drinking water until cleanup standards are met; and

- Prohibit sensitive land uses of the Site such as residences and daycare centers.

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 that 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 Regional Water Board's initial conclusion that background levels of water quality cannot be restored due to the limited cost-effectiveness of available technologies and possibly the migration of significant levels of VOCs from up gradient offsite areas. The cleanup levels in this Order will not unreasonably affect present and anticipated beneficial uses and will not result in exceedance of applicable water quality objectives. 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.

b. **Beneficial Uses**: The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Regional Water 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 Regional Water Board and approved by the State Water Board, the Office of Administrative Law and U.S. EPA, where required.

Regional Water 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

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

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

d. **Basis for Soil Gas Action Levels**: The soil gas action levels for the Site are intended to prevent vapor intrusion into occupied buildings and will result in acceptable residual risk to humans.

e. **Basis for Indoor Air Action Levels**: The indoor air action levels are based on the protection of human health under a commercial/industrial exposure scenario.

14. **Future Changes to Cleanup Standards and Action Levels**: 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 action levels, 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 or action levels can be surpassed, the Regional Water Board may decide that further cleanup actions should be taken.

15. **Risk Management**: The Regional Water Board considers the following human health 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^{-6} to 10^{-4} or less for carcinogens. The 1999 risk assessment for this Site found contamination-related risks in excess of these acceptable levels. Active remediation will reduce these risks over time. However, risk management measures are needed at this Site during active remediation to assure protection of human health. Possible risk management measures considered for this Site include engineering controls (such as engineered caps, wellhead treatment, vapor barriers or operation of building HVAC systems) and institutional controls (such as deed restrictions that prohibit certain land uses).

The following risk management measures are selected for this site:

During remediation: 1) a deed restriction on the property located at 999 East Arques Avenue 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 that property such as residences and daycare centers, and 2) operation of the HVAC system in the 999 East Arques Avenue building to mitigate potential VOC vapor intrusion into indoor air.

16. **Reuse or Disposal of Extracted Groundwater**: Regional 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.

17. **Basis for 13304 Order**: Water Code section 13304 authorizes the Regional Water 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.

18. **Cost Recovery**: Pursuant to Water Code section 13304, the discharger is hereby notified that the Regional Water Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Regional 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.

19. **CEQA**: The project is adoption of an order (final site cleanup requirements) and actions to be taken by the discharger to comply with the order, namely implementing the approved cleanup plan and conducting monitoring activities. All cleanup and monitoring activities will occur in the subsurface. Cleanup plan implementation involves mainly adding benign chemicals to the subsurface for in-situ remediation. The project will have no potential for significant environmental effects and the activities are intended to support site cleanup. The project is therefore exempt from the provisions of the California Environmental Quality Act (CEQA) under the general rule that CEQA applies only to projects that have the potential for causing a significant effect on the environment (Cal. Code Regs., tit. 14, §15061(b)(3) [also known as the "common sense" exemption]).

20. **Notification**: The Regional Water Board has notified the discharger and all interested agencies and persons of its intent under Water Code section 13304 to prescribe site cleanup requirements for the discharge and has provided them with an opportunity to submit their written comments.

IT IS HEREBY ORDERED, pursuant to section 13304 of the Water Code, that the discharger (or its 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 that will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. **REMEDIAL ACTION PLAN AND CLEANUP STANDARDS**

1. **Implement Revised Remedial Action Plan**: The discharger shall implement the RRAP described in finding 12.

2. **Groundwater Cleanup Standards**: The following groundwater cleanup standards shall be met in all wells identified in the Self-Monitoring Program:

Constituent	Standard (ug/L)	Basis
Acetone	700	EPA IRIS Reference Dose
Chloroform	100*	California/EPA MCL
1,1-Dichloroethane	5	California MCL
1,1-Dichloroethene	6	California MCL
Cis-1,2-Dichloroethene	6	California MCL
Trans-1,2-Dichloroethene	10	California MCL
Tetrachloroethene	5	California/EPA MCL
1,1,1-Trichloroethane	200	California/EPA MCL
Trichloroethene	5	California/EPA MCL
Vinyl Chloride	0.5/2	California/EPA MCL

ug/L - micrograms per liter.

* the discharger may meet this limit for total trihalomethanes.

3. **Soil Gas Action Levels:** The following soil gas cleanup standards shall be met in all on-site vadose-zone soils:

Constituent	Standard (ug/m^3)	Basis *
Chloroethane	58,000	Vapor Intrusion
1,1-Dichloroethane	5,100	Vapor Intrusion
1,1-Dichloroethene	120,000	Vapor Intrusion
Cis-1,2-Dichloroethene	20,000	Vapor Intrusion
Trans-1,2-Dichloroethene	41,000	Vapor Intrusion
Tetrachloroethene	1,400	Vapor Intrusion
Trichloroethene	4,100	Vapor Intrusion
Vinyl Chloride	100	Vapor Intrusion

ug/m^3 micrograms per cubic meter

* Commercial/Industrial Land Use Environmental Screening Levels (ESLs) from Table E-2 of the Regional Water Board ESL document dated May 2008.

4. **Indoor Air Action Levels:** The following indoor air action levels shall be met in all on-site buildings:

Constituent	Action Level (ug/m^3)	Basis *
Chloroethane	29	Vapor Intrusion
1,1-Dichloroethane	2.6	Vapor Intrusion
1,1-Dichloroethene	58	Vapor Intrusion

Constituent	Action Level (ug/m^3)	Basis *
Cis-1,2-Dichloroethene	10	Vapor Intrusion
Trans-1,2-Dichloroethene	20	Vapor Intrusion
Tetrachloroethene	0.69	Vapor Intrusion
Trichloroethene	2	Vapor Intrusion
Vinyl Chloride	0.052	Vapor Intrusion

* Commercial/Industrial Land Use ESLs from Table E-3 of the Regional Water Board ESL document dated May 2008

C. TASKS

1. WORKPLAN FOR ADDITIONAL EAB REMEDIATION

COMPLIANCE DATE: 90 days after required by Executive Officer

Submit a workplan acceptable to the Executive Officer for conducting additional enhanced anaerobic biodegradation (EAB) to accelerate groundwater cleanup. The workplan should describe all significant implementation steps and should include an implementation schedule.

2. IMPLEMENTATION OF ADDITIONAL EAB REMEDIATION

COMPLIANCE DATE: 90 days after required by Executive Officer

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified in the Task 1 workplan. For ongoing actions, the report should document system start-up (as opposed to completion) and should present initial results on system effectiveness. Proposals for further system expansion or modification may be included in annual reports (see Self-Monitoring Program).

3. PROPOSED DEED RESTRICTION

COMPLIANCE DATE: December 31, 2012

Submit a proposed deed restriction applicable to the Subunit 1 property located at 999 East Arques Avenue, in a form acceptable to the Executive Officer, whose goal is to limit onsite occupants' exposure to Site contaminants to acceptable levels under an unrestricted use scenario. To that end, the draft deed restriction shall, at a minimum, prohibit the use of shallow groundwater beneath that property as a source of drinking water until cleanup standards are met and prohibit sensitive uses of that property such as residences and daycare centers. The proposed deed restriction shall name the Regional Water Board as a beneficiary and shall anticipate that the Regional Water Board will be a signatory.

4. RECORDATION OF DEED RESTRICTION

COMPLIANCE DATE: 60 days after Executive Officer approval of Task 3 report

Submit a technical report acceptable to the Executive Officer documenting that the deed restriction has been duly signed by all parties and has been recorded with the appropriate county recorder. The report shall include a copy of the recorded deed restriction.

5. FIVE-YEAR STATUS REPORT

COMPLIANCE DATE: December 31, 2017, 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; and
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.

6. EVALUATION OF NEW HEALTH CRITERIA

COMPLIANCE DATE: 90 days after required 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.

7. EVALUATION OF NEW TECHNICAL INFORMATION

COMPLIANCE DATE: 90 days after required by Executive Officer

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

8. **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 Regional Water Board or the Executive Officer may consider revision to this Order.

9. **Report Consolidation**: Technical reports submitted to comply with the above tasks may be combined with analogous reports for other subunits of SDOU (e.g., Remedial Action Plan covering more than one subunit), provided that the combined report fully addresses the task for these subunits.

C. PROVISIONS

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

2. **Good O&M**: 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 Water Code section 13304, to the Regional Water Board for all reasonable costs actually incurred by the Regional 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 Water Code section 13267(c), the discharger shall permit the Regional 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 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. Reports submitted to comply with this provision may be combined with analogous reports for other subunits of SDOU, provided that the combined report fully addresses the Self-Monitoring Program requirements for these subunits.

6. **Contractor/ Consultant Qualifications**: All hydrogeological 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 Regional Water Board using approved U.S. EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Regional Water Board review. This provision does not apply to analyses that can only reasonably be performed onsite (e.g., temperature).

8. **Document Distribution**: An electronic and paper version of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the Regional Water Board and electronic copies shall be provided to the following agencies:

a. City of Sunnyvale, Department of Public Safety
b. Santa Clara Valley Water District

The Executive Officer may modify this distribution list as needed.

Electronic copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be uploaded to the State Water Board's GeoTracker database within five business days after submittal to the Regional Water Board. Guidance for electronic information submittal is available at:
www.waterboards.ca.gov/cwphome/ust/cleanup/electronic_reporting/index.html

9. **Reporting of Changed Owner or Operator**: To the extent practicable, the discharger shall file a technical report on any changes in occupancy, ownership or change of mailing address 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 Regional Water Board by calling (510) 622-2369 during regular office hours (Monday through Friday, 8:00 to 5:00).

A written report shall be filed with the Regional 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 California Emergency Management Agency required pursuant to the Health and Safety Code.

12. **Rescission of Existing Order**: This Order supersedes and rescinds Order Nos. 99-96, 99-097 and 99-100.

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

Digitally signed by Bruce H. Wolfe
Date: 2012.10.05 18:46:17 -07'00'

October 5, 2012
Date

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 13267 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY

==========

Attachments:

Site Map and Self-Monitoring Program