CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 97-064

ADOPTION OF FINAL SITE CLEANUP REQUIREMENTS AND RESCISSION OF ORDER NO. 96-037 FOR:

PHILIPS ELECTRONICS NORTH AMERICAN CORPORATION

for the property located at

740 KIFER ROAD
SUNNYVALE
SANTA CLARA COUNTY

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

1. **Site Location**: The site is located at 740 Kifer Road in Sunnyvale. The site is located approximately 1.5 miles south of Highway 101, and 5 miles south of the San Francisco Bay. Areas surrounding the site are commercial, industrial and residential.

2. **Site History**: Signetics Corporation (Signetics) operated a semiconductor manufacturing facility at the 740 Kifer Road facility from 1970 to 1982. During its site closure activities conducted in 1982, Signetics discovered that chlorinated volatile organic compounds (VOCs), possibly from the wastewater neutralization system, had impacted groundwater.

   Signetics was acquired by the North American Philips Corporation, now known as Philips Electronics North America Corporation (Philips). Philips has assumed cleanup responsibilities at the 740 Kifer Road site. The site is currently owned by Rohm Corporation and is used for semiconductor manufacturing.

3. **Named Dischargers**: Philips, which acquired Signetics and assumed responsibility for Signetics' environmental cleanups, is named as the discharger in this order. The Board reserves the right to name Rohm Corporation as a discharger in the future, based on its status as current property owner.

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

4. **Regulatory Status**: The Board has adopted the following orders for this site:

o Site Cleanup Requirements Order No. 96-037 adopted March 20, 1996
o NPDES Permit Order No. 94-087 adopted July 20, 1994

The purpose of this order is to update the previous SCR and to approve the final remedial measures for the site.

5. **Site Hydrogeology**: The site is flat and slopes gently to the north. The site is underlain by alluvial channel deposits consisting of silt and clay layers interbedded with sand and gravel layers. The deposits are of variable thickness and are laterally discontinuous. The A-zone is encountered at approximately 10 feet below ground surface, and extends to approximately 30 feet below ground surface. Groundwater in the A-zone flows generally to the northeast. The B zone is encountered at approximately 30 feet below ground surface, and extends to approximately 60 feet below the ground surface. Groundwater in the B-zone flows generally to the north-northeast.

6. **Remedial Investigation**: Site investigation was initiated in 1982 after VOCs were found in groundwater at the site, possibly originating from the wastewater neutralization system. Soils in the area of the tanks indicated that soil was impacted with low levels (generally less than 1 ppm) of VOCs. Groundwater monitoring wells were also installed on- and off-site; sampling of the wells in the 1980s indicated that the A-zone beneath the site was impacted with up to 1400 ppb total VOCs, substantially higher than drinking water standards. Significantly lower levels of VOCs were also detected in the B-zone. Currently, the maximum total VOC concentrations are less than 350 ppb. The extent of groundwater pollution has been sufficiently defined. The VOC plume is approximately 400 feet wide and 900 feet long, and extends into off-site areas along San Gabriel Drive.

   Additional remedial investigation was conducted in 1996 as required in Order No. 96-037. The results of the investigations confirm that the vertical and lateral extent of groundwater contamination has been defined. No detectable levels of VOC contamination were detected in the B2-aquifer.

7. **Adjacent Sites**: Within a one mile radius of the Philips site are a number sites which are confirmed sources of VOC groundwater contamination. Because the area is largely industrial, there are also a number of other potential sources of VOC groundwater contamination. However, based on the available data, the VOC groundwater plume originating from the Philips site does not appear to be commingling with pollution plumes originating from other sites. Should additional information indicate that commingling does exist, modifications may be made to this order.

8. **Interim Remedial Measures**: Philips removed the wastewater neutralization system in 1983. During replacement the impacted soils surrounding the tanks were removed

and disposed off-site. Groundwater remediation began in 1983 with the installation and operation of one A-zone extraction well and one B-zone extraction well, both located on-site near the possible source area. Remediation was expanded in 1987 with the installation of one additional A-zone extraction well, located north of the site on San Gabriel Drive. The extraction system is currently extracting approximately 27,000 gallons per day from both the A- and B-zone. Remedial measures need to be continued at this site to reduce the threat to water quality, public health, and the environment posed by the discharge of waste.

9. **Feasibility Study**: In its March 1997 report, Philips evaluated alternatives for final groundwater remedial actions, a risk assessment for current and post-cleanup exposures, and recommended final remedial actions and cleanup standards. Based on Philips evaluation, continued operation of the present groundwater pump and treat system is the best available technology for addressing groundwater VOC contamination. Philips identified no modifications to the existing system which would improve groundwater remediation. Although Philips evaluation indicates that it is uncertain whether the preliminary cleanup levels (MCLs) can be met within a reasonable time with the current remediation system, Philips proposes no alternative cleanup levels because of current designations of beneficial uses of groundwater.

10. **Cleanup Plan**: Philips proposes to continue operation of the present groundwater pump and treat system in the A-aquifer and to discontinue operation of the one on-site B1 aquifer extraction well. Two additional B1-aquifer monitoring wells will be installed and monitored. Adjustments to groundwater pumping rates at extraction wells may be proposed at a later time. Philips may also evaluate cleanup technologies, groundwater cleanup standards, and alternative management strategies (such as containment zones) at a later time should VOC concentrations reach asymptotic levels with on-going remediation or if potential beneficial use designations for groundwater at the site and vicinity are modified.

11. **Risk Assessment**: Groundwater at the Philips site and vicinity is impacted with chlorinated VOCs, some of which are classified as possible human carcinogens; others are are classified as non-carcinogens. Philips performed a risk assessment to evaluate the cancer risks and noncancer hazards to humans from possible exposures to the VOCs under two scenarios: current groundwater use and potential future groundwater use.

    Currently, shallow groundwater at the site and vicinity is not used as drinking water. Results of the risk assessment for the current conditions indicated that no remedial action is necesary. This is because the cancer risk and hazards from exposure to humans via inhalation of VOCs volatilizing into indoor air from groundwater were below levels which the Board considers acceptable at groundwater cleanup sites (less than 1E-4 for carcinogens, and less than the hazard index (1) for non-carcinogens).

The potential future groundwater use scenario asumes that groundwater could be used for drinking water based on the potential beneficial uses identified in finding 12b. Results of the risk assesment for this potential future groundwater use scenario indicated that remedial action to reduce VOC concentrations is necessary to protect future on- and off-site residents from potential future exposure pathways of ingestion and inhalation of VOCs from groundwater at the site and the vicinity. Total risk upon attainment of groundwater cleanup standards will be below levels which the Board considers acceptable at groundwater cleanup sites (less than 1E-4 for carcinogens, and less than the hazard index (1) for non-carcinogens).

Due to excessive risk that will be present at the site pending full remediation, institutional constraints at the site are appropriate to limit on-site exposure to acceptable levels. Institutional constraints should include a deed restriction (or an eqivalent mechanism) that notifies future owners of the site of sub-surface contamination and prohibits the use of shallow groundwater beneath the site as a source of drinking water until cleanup standards are met. Rohm Corporation, the current property owner, has indicted its willingness to implement institutional constraints without being required to do so as a condition of this order. The Board will consider naming Rohm Corporation as a discharger and creating a deed restriction task if the institutional constraints are not promptly proposed and executed in a form acceptable to the Executive Officer.

12. **Basis for Cleanup Standards**

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

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

b. **Beneficial Uses**: The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory

provisions is contained in 23 CCR 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

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

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

a. Municipal and domestic water supply
b. Industrial process water supply
c. Industrial service water supply
d. 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**: The groundwater cleanup standards for the site are based on applicable water quality objectives and are the more stringent of EPA and California primary maximum contaminant levels (MCLs). Cleanup to this level will result in acceptable residual risk to humans.

13. **Future Changes to Cleanup Standards**: The goal of this remedial action is to restore the beneficial uses of groundwater underlying and adjacent to the site. Results from other sites suggest that full restoration of beneficial uses to groundwater as a result of active remediation at this site may not be possible. If full restoration of beneficial uses is not technologically nor economically achievable within a reasonable period of time, then the discharger may request modification to the cleanup standards or establishment of a containment zone, a limited groundwater pollution zone where water quality objectives are exceeded. Conversely, if new technical information indicates that cleanup standards can be surpassed, the Board may decide if further cleanup actions should be taken.

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

15. **Basis for 13304 Order**: The dischargers has caused or permitted waste to be

discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance.

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

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

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

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

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the 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 which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.

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

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

B. CLEANUP PLAN AND CLEANUP STANDARDS

1. **Implement Cleanup Plan**: The discharger shall implement the cleanup plan described in finding 10.

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

Constituent	Cleanup Standard (ug/l)	Basis
1,1,-Dichloroethane	5	CA MCL
1,2-Dichloroethane	0.5	CA MCL
1,1-Dichloroethene	6	CA MCL
cis-1,2-Dichloroethene	6	CA MCL
trans-1,2-Dichloroethene	10	CA MCL
Chloroform	100*	CA MCL
Trichlorotrifluoroethane	1,200	CA MCL
Trichlorofluoromethane	150	CA MCL
1,1,1-Trichloroethane	200	CA, Federal MCL
Trichloroethene	5	CA MCL
Perchlorethylene	5	CA, Federal MCL

* The State MCL for the sum of all trihalomethanes. The only trihalomethane detected in groundwater at the site is Chloroform.

C. TASKS

1. FIVE-YEAR STATUS REPORT

COMPLIANCE DATE: April 16, 2002

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.

2. **PROPOSED CURTAILMENT**

COMPLIANCE DATE: 60 days prior to proposed curtailment

Submit a technical report acceptable to the Executive Officer containing a proposal to curtail remediation. Curtailment includes system closure (e.g. well abandonment), system suspension (e.g. cease extraction but wells retained), and significant system modification (e.g. major reduction in extraction rates, closure of individual extraction wells within extraction network). 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.

3. **IMPLEMENTATION OF CURTAILMENT**

COMPLIANCE DATE: 60 days after Executive Officer approval

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

4. **EVALUATION OF NEW HEALTH CRITERIA**

COMPLIANCE DATE: 90 days after requested by Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating the effect on the approved 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.

5. **EVALUATION OF NEW TECHNICAL INFORMATION**

COMPLIANCE DATE: 90 days after requested by Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating new technical information which bears on the approved 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.

6. **Delayed Compliance**: If the discharger is delayed, interrupted, or prevented from meting one or more of the completion dates specified for the above tasks, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order.

C. PROVISIONS

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

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

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

4. **Access to Site and Records**: In accordance with California Water Code Section 13267(c), the discharger shall permit the 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.

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

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

8. **Document Distribution**: All correspondence, technical reports, and other documents pertaining to compliance with this Order shall be sent to the attention of the designated Board staff person. Copies of all correspondence, technical reports (excluding routine groundwater monitoring reports and NPDES reports), and other documents pertaining to compliance with this Order shall be provided to the following agencies:

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

9. **Reporting of Changed Owner or Operator**: To the extent practicable, the discharger shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.

10. **Reporting of Hazardous Substance Release**: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the discharger shall report such discharge to the Regional Board by calling (510) 286-1255 during regular office hours (Monday through Friday, 8:00 to 5:00).

    A written report shall be filed with the Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected

area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

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

11. **Rescission of Existing Order**: This Order supersedes and rescinds Order Nos. 96-037.

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

I, Loretta K. Barsamian, 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 May 21, 1997.

Loretta K. Barsamian
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 13267 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY
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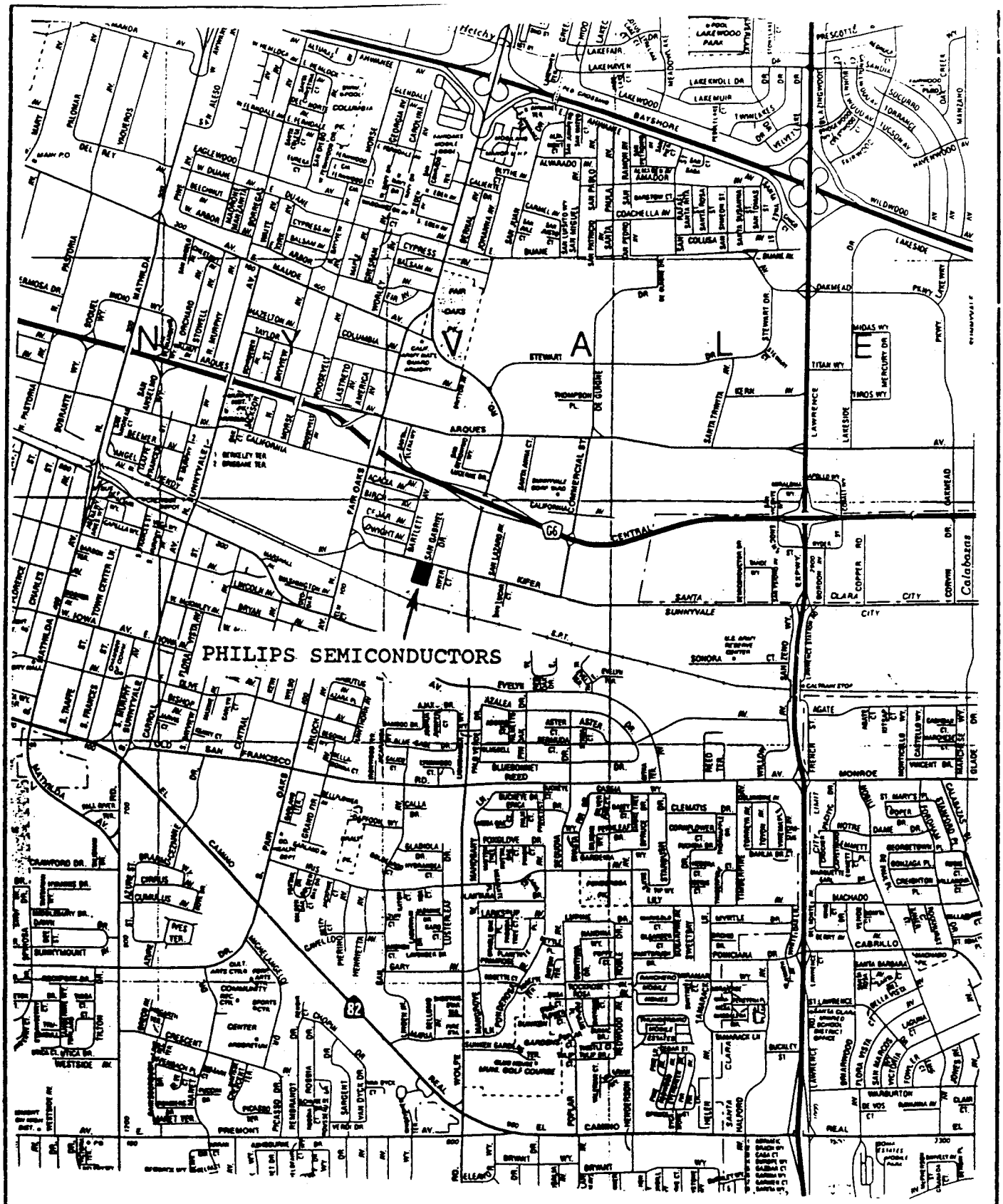
Attachments: Site Map
Self-Monitoring Program



NORTH

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SITE LOCATION

PHILIPS SEMICONDUCTORS
740 KIFER ROAD, SUNNYVALE

DRAWN BY: CSF	DATE: 3/96	DRWG. NO.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

PHILIPS SEMICONDUCTORS

for the property located at

740 KIFER ROAD
SUNNYVALE
SANTA CLARA COUNTY

1. **Authority and Purpose**: The Board requests the technical reports required in this Self-Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Board Order No. 97-064 (site cleanup requirements).

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

Well #	Sampling Frequency	Analyses	Well #	Sampling Frequency	Analyses
S009A	A	8010	S109A	A	8010
S035A	A	8010	S112A	A	8010
S035B	A	8010	S120A	A	8010
S036A	A	8010	S009B	A	8010
S037A	A	8010	S010B	A	8010
S037B	A	8010	S036B	A	8010
S102A	A	8010	S102B	A	8010
S103A	A	8010	S104A	A	8010
S106A	A	8010	S105A	A	8010
S107A	A	8010	S110A	A	8010

Key: A = Annually 8010 = EPA Method 8010 or equivalent

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

3. **Annual Monitoring Reports**: The discharger shall submit annual monitoring reports to the Board no later than 30 days following the end of the fourth quarter. The first annual report will be due on January 30, 1998. 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 map should be prepared for each monitored water-bearing zone for each semi-annual event. Historical groundwater elevations should be included with each annual report.

   c. Groundwater Analyses: Groundwater sampling data shall be presented in tabular form, and an isoconcentration map should be prepared for one or more key contaminants for each monitored water-bearing zone, as appropriate. The report shall indicate the analytical method used and detection limits obtained for each reported constituent. Historical groundwater sampling results shall be included in each annual report. 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 reporting period. The report shall also include contaminant removal results, from groundwater extraction wells and from other remediation systems (e.g. soil vapor extraction), expressed in units of chemical mass per day and mass for the reporting period. Historical mass removal results shall be included in each annual report.

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

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

5. **Other Reports**: The discharger shall notify the Board 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 discharger or his/her agent shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the 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, Loretta K. Barsamian, Executive Officer, hereby certify that this Self-Monitoring Program was adopted by the Board on May 21, 1997.

Loretta K. Barsamian

Loretta K. Barsamian
Executive Officer